

The Farm Management Handbook 2024/25

Editor

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October 2024

*This publication is funded by the Scottish Government
as part of the SRDP Farm Advisory Service (FAS)*

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Price: £34 plus postage and packaging

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ELECTRONIC VERSION OF THE FARM MANAGEMENT HANDBOOK

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Foreword

Following the change of government at the UK general election in July 2024, many of us had hopes for a brighter future and economic stability. With the realities of the economic landscape laid bare by the new UK government, it appears that difficult times lie ahead once again with tax rises looming on the horizon as the government attempts to balance income and expenditure whilst also maintaining public services as well as support to the rural economy.

In Scotland, we are fortunate enough to have retained agricultural support in the form of the Basic Payment Scheme (BPS) and much of the framework for those involved in agriculture has now been unveiled for the period up until 2028. From 2025, farmers will need to ensure that the different component parts of the Whole farm Plan are put in place – both to safeguard eligibility for BPS support and to help optimise returns.

2024 has been another challenging year for agricultural businesses, not least due to the disappointing weather conditions during the summer. Poor weather has produced much frustration for cereal growers with only short time windows available for harvesting crops, and further impact upon crop yields and straw quality.

Besides setting out current gross margins for the main agricultural sectors including arable, beef, sheep, dairying, pigs, and poultry production, the Farm Management Handbook also provides readers with some recent background and price trends for each sector. The 2024/25 handbook also highlights some new developments in agriculture such as the consultation on Ultra-High Frequency (UHF) cattle eartags, the requirement for bird keepers to register on the Scottish Kept Bird Register, and the criteria for whole farm plans from 2025.

The SAC Farm Management Handbook is a budgeting book. The Handbook is an annual publication - more regular market and input cost data are provided at www.fas.scot under '*Publications*'. Enterprise budgets are expressed to gross margin level. The fixed costs of an individual business should also be considered when preparing forward budgets as they can have a significant impact on the profitability and/or success of a business.

The 45th edition of the Farm Management Handbook, produced with the support of the Scottish Government's SRDP Farm Advisory Service (FAS), provides a comprehensive and up-to-date source of information for all involved in the assessment and planning of farm and rural businesses. The Handbook could not be produced without the help of colleagues and friends throughout the industry. This help, and indeed all comments and suggestions, are very much appreciated.

Alastair Beattie,
October 2024

Acknowledgements

SAC Consulting acknowledges with thanks the considerable assistance received from many people outside SRUC and from specialist colleagues within the organisation. In particular, the following people have made major contributions to this edition of the Handbook:

Val Angus, Rebecca Audsley, Christine Beaton, Craig Bothwell, Mark Bowsher-Gibbs, Iain Boyd, Kirsty Carnegy, Aileen Carr, George Chalmers, Mhairi Dalgliesh, David Eadie, Poppy Frater, Jennifer Galloway, Neil Havis, Laura Henderson, Calum Johnston, Ewan Johnston, Lorna MacPherson, Siobhan MacDonald, Robin Mair, Dr Foteini Manolaraki, Colin Mason, Gavin Prentice, Anna Sellars, Janette Sutherland, Alistair Trail, Kirsten Williams and Mary Young.

SAC Consulting would like to thank the following organisations for their contribution to the Handbook:

The Scottish Government

Chiene + Tait CA, Edinburgh

The Scottish Machinery Rings

Thank you to the following organisations for supplying seed pricing data:

- Agri Solutions
- Aspatria Farmers
- Carrs Billington
- DLF Seeds
- Germinal
- Grainseeds
- Jack Lamb Agri
- Watsons Seeds

SAC Consulting would also like to thank the individuals and organisations that help update the Handbook. Your contributions are very much appreciated.

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Enterprise Budgeting

The Farm Management Handbook is designed to provide guidelines in preparing forward budgets.

Output

Output is based on anticipated sales prices (adjusted for replacement costs where required) plus enterprise specific subsidies (as applicable). Livestock output prices are based on market forecasts while crop output prices are based on forward sales values for 2025 as set in summer 2024.

All non enterprise specific subsidies, e.g. Basic Payment Scheme (BPS) and Less Favoured Area Support Scheme (LFASS) are excluded from the enterprise gross margins. These subsidies are regarded as whole farm income therefore should be included in whole farm gross margin budget calculations. See Rural Aid Schemes section (page 467) for more information on subsidies.

Variable costs

Variable costs (e.g. feed, seed, fertiliser, vet and medicine and sprays) are specific to an enterprise and vary in proportion to the size of the enterprise. Enterprise gross margins will vary considerably between individual businesses due to differing land quality, climate, production system, yields, prices and managerial abilities. All variable costs are based on projected prices for the year ahead, set in summer 2024.

Gross margins

A gross margin is **not** a profit figure. No account is taken of "fixed" or "overhead" costs such as labour, power and machinery, property upkeep, rent or finance charges.

The gross margin of an enterprise is:

OUTPUT

less

VARIABLE COSTS

Enterprise performance levels are expressed on a per head basis and, for land using enterprises, on a per hectare (acre) basis. It is also assumed that the enterprise is in a "steady state" where, for instance, the size of a dairy herd is the same at the start and end of the year.

The gross margin data represents good technical performance at estimated prices for 2024/25 but should not be regarded as industry standards or targets, nor should it be used as actual data for compensation purposes. That is, these are indicative margins that should be customised to the specific requirements of the user.

Fixed costs

Fixed costs (e.g. labour, machinery, general overheads and finance) are costs that cannot readily be allocated to a specific gross margin. Fixed costs are generally unaffected by small changes in enterprise size but can vary from year to year. As a result, they are often referred to as overhead or indirect costs. Depreciation (for property and machinery) is also considered as a fixed cost and it is useful to keep this separate to allow a broad assessment of the capital investment needs of a business. If actual fixed costs are not available for a particular farm type, the figures in the Whole Farm Data section (page 445) can be used.

Rounding

Because of rounding, individual items may not add to sub-totals or totals.

Remember! The gross margins are indicative and are not industry standards or targets. Care should therefore be taken when comparing actual results with values in the handbook or when using this information for budgeting purposes. Data should be adjusted to reflect local physical differences and changes in price.

Should you require assistance in using the Handbook, please contact your local SAC Consulting office. For contact details see Contacts section (page 552).

Crop Inputs

Introduction

Crop inputs such as fertilisers, organic manures, lime and sprays all have a quantifiable value on farm. This section provides information that many of the crop gross margins and grassland and forage crop cost of production data refer to and include.

Fertiliser

Fertiliser levels used in the enterprise data are intended only as a guide for budgeting purposes and should not be regarded as a recommendation. In practice, many factors affect the level of N, P₂O₅ and K₂O required by a specific crop, including previous cropping policy, the quantity of organic manures being used and soil nutrient status. Budgeted N levels will require adjustment for Nitrate Vulnerable Zone (NVZ) Action Programme regulations.

Fertiliser prices used are based on typical prices paid in summer 2024. Fertiliser costs used in the gross margins are shown in the table below.

	Fertiliser Price	Nutrient Cost
Nitrogen (Ammonium Nitrate)	£331.00 /t	£0.96/kg N
Phosphate (Triple Super Phosphate)	£471.00 /t	£1.02/kg P ₂ O ₅
Potassium (Muriate of Potash)	£358.00 /t	£0.6/kg K ₂ O

All gross margins assume nutrients are derived from purchased fertiliser and applied to soils at moderate P and K status. Nutrient inputs for crops should be adjusted for applied organic nutrients which can reduce costs.

Lime

No charge for share of lime is included in the variable costs of arable, grassland and forage crops. Costs for lime will vary significantly depending on type (e.g. calcium, magnesium), distance from source, type of haulage (artic or 8 wheeler) and spreading contractor's charges. An appropriate annual maintenance charge (including delivery and application) to be included in individual margins could be calculated to suit specific farm practice using the example below:

Cost	Rate	Frequency of application	Annual charge
£40/t	3.7t/ha	4 years	£37.00/ha

For more information on lime see SRUC Technical Note 656.

Slurry and Manure

Use of slurries or manures has not been considered in the enterprise data but organic manures are a valuable source of major nutrients (N, P₂O₅ and K₂O), secondary nutrients, trace elements and organic matter.

When planning inorganic fertiliser applications for crops and grassland, the total crop requirement should be adjusted to account for any use of slurries and manures.

The following table is an estimated value based on the total nutrients present in the stored slurry and manure prior to application to land.

Manure Type	DM (%)	Total plant nutrient	kg/t or kg/m³	£/kg	Total value (£/t or £/m³)
Cattle FYM (Fresh)	25	N	6.0	0.96	5.76
		P ₂ O ₅	3.2	1.02	3.28
		K ₂ O	8.0	0.60	4.77
					13.81
Cattle Slurry	6	N	2.6	0.96	2.49
		P ₂ O ₅	1.2	1.02	1.23
		K ₂ O	3.2	0.60	1.91
					5.63
Sheep FYM (Fresh)	25	N	7.0	0.96	6.72
		P ₂ O ₅	3.2	1.02	3.28
		K ₂ O	8.0	0.60	4.77
					14.77
Pig FYM (Fresh)	25	N	7.0	0.96	6.72
		P ₂ O ₅	6.0	1.02	6.14
		K ₂ O	8.0	0.60	4.77
					17.63
Pig Slurry	4	N	3.6	0.96	3.45
		P ₂ O ₅	1.8	1.02	1.84
		K ₂ O	2.4	0.60	1.43
					6.73
Layer manure	35	N	19.0	0.96	18.23
		P ₂ O ₅	14.0	1.02	14.33
		K ₂ O	9.5	0.60	5.67
					38.23
Broiler/turkey litter	60	N	30.0	0.96	28.78
		P ₂ O ₅	25.0	1.02	25.60
		K ₂ O	18.0	0.60	10.74
					65.12

Availability to crops of the nutrients in organic manures will be significantly altered by the timing and method of application, and other factors including temperature, rainfall and crop growth stage and health. For further guidance on the use of organic manures, refer to SRUC Technical Note 650.

Nutrient Planning

Using the information below, total quantities of slurries and manures produced on farm can be calculated.

Livestock	Typical volume of excreta produced	
	m ³ /day	m ³ /wk
Dairy Cow (annual milk yield > 9,000l)	0.064	0.45
Dairy Cow (annual milk yield 6,000-9,000l)	0.053	0.37
Dairy Cow (annual milk yield < 6,000l)	0.042	0.29
Dairy Heifer (13 months to first calf)	0.040	0.28
Dairy Heifer (3 to 13 months)	0.020	0.14
Beef Cow (> 500kg)	0.045	0.32
Beef Cow (≤ 500kg)	0.032	0.22
Steer/heifer (over 25 months)	0.032	0.22
Steer/heifer (13 to 25 months)	0.026	0.18
Cattle (3 to 13 months)	0.020	0.14
Bull beef (over 3 months)	0.026	0.18
Calf (up to 3 months)	0.007	0.05
Sow (130 to 225kg) & litter	0.011	0.08
Maiden Gilt (90 to 130kg)	0.006	0.04
Breeding Boar (66 to 150kg)	0.006	0.04
Breeding Boar (over 150kg)	0.008	0.06
Weaner (7 to 31kg)	0.001	0.01
Grower (31 to 66kg) - dry fed/liquid fed	0.004/0.007	0.03/0.05
Finisher (66kg to slaughter) - dry fed/ liquid fed	0.006/0.010	0.04/0.07
Ewe (> 60kg)	0.005	0.04
Ewe (≤ 60kg)	0.003	0.02
Lambs (6 months to tupping)	0.002	0.01
Goat	0.003	0.02
Breeding deer	0.006	0.04
Other deer	0.003	0.02
Horse	0.024	0.17
Laying Hens (per 1000, up to 17 wks)	0.040	0.28
Laying Hens (per 1000 caged, > 17 wks)	0.120	0.84
Laying Hens (per 1000 free range, > 17 wks)	0.091	0.64
Broilers (table, per 1000)	0.120	0.84
Broiler (breeders, per 1000, up to 25 wks)	0.040	0.28
Broiler (breeders, per 1000, > 25 wks)	0.120	0.84
Turkeys (per 1000, male)	0.160	1.12
Turkeys (per 1000, female)	0.120	0.84
Ducks (per 1000)	0.100	0.70

When calculating quantities of slurries and manures as part of a farm waste management plan, adjustments for livestock numbers, housing periods and collection of contaminated water and bedding (e.g. straw and sawdust) will be required.

For further information on nutrient planning refer to Nitrate Vulnerable Zones guidance and SRUC Technical Notes 633, 649, 650, 651, 652, 655, and 668 or Nutrient Management Guide (RB209).

For more information on NVZ's across the UK, see:

Scotland -

www.gov.scot/Topics/farmingrural/Agriculture/Environment/NVZintro

England -

<https://www.gov.uk/guidance/nutrient-management-nitrate-vulnerable-zones>

Wales -

<https://gov.wales/cross-compliance-nitrate-vulnerable-zones-smr-1-2014>

Northern Ireland -

<https://www.daera-ni.gov.uk/news/nitrates-action-programme-nap-activity-calendar>

Planet Scotland

PLANET Scotland is a software system designed to help farmers improve their financial and environmental performance through better use of organic and bagged fertilisers. It has been specially developed to take Scottish soils, cropping and growing conditions into account. This practical approach to nutrient management aims to give farmers a real win:win and, with the increasing focus on reducing emissions that contribute to climate change, could also help farms reduce their carbon footprint and so benefit both the business and the wider environment.

PLANET stands for Planning Land Application of Nutrients for Efficiency and the Environment and this outlines the approach that the software takes. Farmers and growers in NVZs will already be familiar with this planning approach and PLANET Scotland will allow NVZ farmers to use information produced by PLANET as part of their NVZ record keeping as well as benefiting from all of PLANET's other features. It will also integrate with standard desktop agronomy packages and therefore will only require key data to be entered once. In addition to fertiliser application, the software will also help with farm gate nutrient balances and with planning slurry storage requirements.

The software is available free of charge to all Scottish farmers and growers and to their consultants. There is a programme of workshops, on-line and PC-based training packages including video material, a helpline for IT and technical enquiries, and a dedicated website available to help users. To find out more, see www.planet4farmers.co.uk.

Residual Values of Fertilisers, Manures and Lime

Many fertilisers and manures have a residual value that needs to be calculated as part of a farm valuation or when a farm transfers between owners or tenants.

Estimates of the residual value of manures can be obtained by a feeding stuff calculation or by calculation of nutrients in manure (FYM) or slurry. The following valuations are based on information taken from SRUC Technical Notes on fertilisers as noted on page 7. Valuers must show discretion in the values used and to vary the values used according to the standard of husbandry, previous cropping, the state of drainage and the effectiveness of crop protection. Values are given in respect to growing seasons, not calendar years.

Compensation for manures using the residual values of feeding stuffs

Residues of feeding stuffs fed to livestock will be recovered in manures or slurries thus giving these organic manures a specific value. The values of nutrients in purchased feeds or feeds produced on the farm which are retained in farmyard manures or slurries can be calculated using the figures in the following table.

Feeding stuff	Average % in feeding stuff			Compensation value (£)	
	N	P ₂ O ₅	K ₂ O	per tonne of food consumed	
				Before 1 growing season	After 1 growing season
Soya bean meal or cake	6.99	1.50	2.68	15.03	7.52
Rapeseed meal or cake	5.77	2.33	1.55	9.95	4.97
Beans	4.53	1.03	1.39	8.22	4.11
Peas	3.52	1.15	1.14	6.81	3.41
Fish meal	10.50	7.63	1.03	11.65	5.83
Wheat	1.75	0.65	0.47	2.99	1.50
Barley	1.78	0.79	0.52	3.29	1.64
Oats	1.48	0.67	0.52	3.13	1.57
Maize	1.42	0.60	0.37	2.41	1.20
Bran & other offals of wheat	2.54	2.36	1.49	8.61	4.30
Maize gluten 60%	9.68	0.58	0.12	4.05	2.03
Brewers' & distillers' grain (wet)	1.07	0.23	0.02	0.55	0.28
Brewers' and distillers' grain (dried)	3.42	1.03	0.06	1.89	0.95
Hay	1.49	0.51	2.16	10.40	5.20

Feeding stuff	Average % in feeding stuff			Compensation value (£) per tonne of food consumed	
	N	P ₂ O ₅	K ₂ O	Before 1	After 1
				growing season	growing season
Dried grass	2.80	0.73	2.92	14.34	7.17
Grass silage	0.69	0.19	0.79	3.85	1.93
Wheat straw	0.54	0.15	1.07	5.04	2.52
Barley straw	0.58	0.22	1.53	7.14	3.57
Oat straw	0.46	0.18	1.82	8.38	4.19
Straw treated with ammonia	0.96	0.18	1.22	5.86	2.93
Swedes	0.15	0.06	0.24	1.15	0.58
Turnips	0.19	0.08	0.20	1.00	0.50
Potatoes	0.30	0.09	0.58	2.74	1.37
Dried sugar beet					
pulp (molasses)	1.55	0.15	1.92	9.18	4.59
Pot ale syrup	2.52	2.26	1.25	7.48	3.74
Molasses (sugar cane)	0.65	0.20	3.42	15.61	7.81
Compound cakes & meals					
for each 1% crude protein	0.16	0.08	0.06	0.36	0.18
Feed additives containing					
urea for each 1% crude					
protein	0.16	0.00	0.00	0.05	0.03

For further feeding stuffs see PLANET (www.planet4farmers.co.uk).

The calculation of nutrients in FYM or slurry from feeding stuffs depends on the following principles:

- The proportions of nutrients present in FYM and slurry will under ideal conditions be 35% for N, 45% for P₂O₅ and 75% K₂O.
- Where storage conditions are sub-optimal then these percentages should be reduced by up to half.
- For slurry, the percentage given in a) for N should only be used for spring or summer application. For autumn and winter application the allowances should be reduced by 2/3 and 1/3 respectively.

An example calculation for the value of FYM taken from the nutrients from a feeding stuff is shown in the table overleaf:

e.g. residual value of one tonne of barley fed to livestock.

Plant Nutrient	kg/t	£/kg	Total £/t	%	Value of FYM (£/t)	
					Before 1 growing season	After 1 growing season
N	17.8	0.96	17.08	35	5.98	2.99
P₂O₅	7.9	1.02	8.09	45	3.64	1.82
K₂O	5.2	0.60	3.10	75	2.33	1.16
			28.27		11.94	5.97

In calculating the value of manures, instances occur where records of the feeds fed to livestock are not available. In this case, the value of stored farmyard manure or slurry can be estimated on the basis of the average nutrient content as shown in the following tables whilst also considering, in the case of slurry, the season of application.

Residual value of fertilisers and manures

The current value of the major plant nutrients, the principal forms used in agriculture, and proportions available for use over time for which compensation can be estimated is detailed in the following table:

Source		Proportion of applied plant nutrients available for crop use after (growing season)		
		1	2	3
N	(a) Inorganic fertilisers, dried blood, dried poultry manure and liquid digested sludge	nil	nil	nil
	(b) Other organic manures	1/5	1/10	nil
P₂O₅	All fertilisers and manures	1/2	1/4	1/8
K₂O	All fertilisers and manures	nil	nil	nil

Storage and application principals, as per those stated in the previous section, will affect the value of manures. In the following examples, the proportion of nutrients available in the three growing seasons following application as a compound fertiliser (for example 20:10:10), fresh cattle FYM and cattle slurry, are valued.

e.g. application of 1 tonne of 20:10:10 compound fertiliser.

Plant Nutrient	kg/t	£/kg	Total £/t	Value of fertiliser (£/t) after (growing season)		
				1	2	3
N	200	0.96	191.88	nil	nil	nil
P ₂ O ₅	100	1.02	102.39	51.20	25.60	12.80
K ₂ O	100	0.60	59.67	nil	nil	nil
			353.94	51.20	25.60	12.80

e.g. application of 1 tonne of fresh cattle FYM.

Plant Nutrient	kg/t	£/kg	Total £/t	Value of organic manure (£/t) after (growing season)		
				1	2	3
N	6.0	0.96	5.76	1.15	0.58	nil
P ₂ O ₅	3.2	1.02	3.28	1.64	0.82	0.41
K ₂ O	8.0	0.60	4.77	nil	nil	nil
			13.81	2.79	1.39	0.41

e.g. application of 1 tonne of fresh cattle slurry.

Plant Nutrient	kg/m ³	£/kg	Total £/t *	Value of organic manure (£/t) after (growing season)		
				1	2	3
N	2.6	0.96	1.66	0.33	0.17	nil
P ₂ O ₅	1.2	1.02	1.23	0.61	0.31	0.15
K ₂ O	3.2	0.60	1.91	nil	nil	nil
			4.80	0.95	0.47	0.15

* N adjustment for winter application timing.

Residual value of lime

The loss of lime from soils varies over time and for specific field circumstances (e.g. soil type, annual rainfall, high use of nitrogen) however, the average rate of loss from the soil is equivalent to about 0.35 tonnes of calcium oxide (CaO) per hectare per annum.

Considering this, there is a residual value for lime applications which may be useful when valuing farm assets in a farm valuation or a farm transfer between owners or tenants.

Compensation for lime residues should be based on the neutralising value (NV) of the lime applied, normally reduced by 0.35 tonnes of calcium oxide per hectare or by one-seventh, whichever is the greater for each growing season since the time of application. Compensation for

lime should be calculated on the basis of the current price (delivered and spread) for the residual quantity.

An appropriate calculation of residual quantity of liming materials is set out in the following table:

Quantity applied (NV %) t/ha	CaO equiv. applied t/ha	Annual loss of CaO equivalent t/ha	Residual quantity of CaO equivalent (t/ha) after (growing season)						
			1	2	3	4	5	6	7
7.0 (50%)	3.50	$\frac{1}{7}(0.50)$	3.0	2.5	2.0	1.5	1.0	0.5	nil
4.4 (46%)	2.02	0.35	1.67	1.32	0.97	0.62	0.27	nil	nil

Pesticide Use

For each of the arable and potatoes gross margins, and the grassland and forage crops variable cost data, pesticides (including herbicides, insecticides, fungicides, nematicides and plant growth regulators where applicable) are included as appropriate for each crop. Pesticide programs are from independent SAC agronomists.

Pesticide product prices used are only an indication of industry prices and do not account for volume/group discounts and regional variances. Agronomy fees (not included in gross margins and variable cost data) can range from £10/ha for spring cropping to £13/ha for winter cropping.

Read the label before you buy and use pesticides safely. Care must be taken to choose a brand of a pesticide product which has been authorised for use on the crop. Not all brands of a particular pesticide are authorised for the same uses or crops. Be on the lookout for counterfeit pesticides.

A full list of pesticides can be found in The UK Pesticide Guide 2024 (or online at www.plantprotection.co.uk) and also at Pesticides Register of Authorised Plant Protection Products.

The use of pesticides is controlled under the Food and Environment Protection Act 1985, and subsequent EU Regulations. All EU regulations were transferred into GB legislation on 1st January 2021.

Anyone who uses plant protection products or adjuvants must register as a professional user according to the 2020 regulations ([Professional plant protection products \(PPPs\): register as a user - GOV.UK \(www.gov.uk\)](http://www.gov.uk)). Anyone who uses a pesticide must take “reasonable precautions” to protect human health or the environment. Anyone with the need to use a professional pesticide product in the course of their business or employment may not use that pesticide or give instruction to others on the use of that pesticide unless they have received adequate instruction, training, and guidance in the correct use of that pesticide. They must

hold a Chemicals Regulation Directorate (CRD) recognised Certificate of Competence unless they are working under the direct supervision of someone who holds a certificate (i.e. they are being trained). Those previously operating under 'grandfathers rights' (i.e. born before 31 December 1964) must now also have a Certificate of Competence.

It is the responsibility of the purchaser of a professional pesticide product to ensure that the intended user holds a Certificate of Competence.

Those who hold a Certificate of Competence approved by the CRD for the safe application of pesticides can join the National Register of Spray Operators (NRoSO). The scheme ensures that operators participate in ongoing continuous professional development (CPD). UK quality assurance schemes such as Scottish Quality Crops generally require that the NRoSO membership number of the operator making spray applications to quality assured crops is recorded for each spray application.

Currently, the recognised Certificate of Competence for the use of pesticides are issued by the National Proficiency Tests Council (Tel: 024 7685 7300) and the Scottish Skills Testing Service (Tel: 0131 339 8739).

Quality assurance schemes, such as Scottish Quality Crops or Red Tractor Assurance, require that competence to advise on pesticide usage and to apply pesticides is demonstrated by evidence of appropriate training and qualifications, i.e. BASIS Professional Register numbers, Pesticide Application (PA) certificates or equivalent, and NRoSO membership details.

Off-label use

The product label does not cover every possible use of a pesticide product. Minor uses are often covered by an Extension of Authorisation for Minor Use (EAMU). Use of any chemical in accordance with an EAMU is entirely at growers' risk, and growers must obtain and read the appropriate document for that particular authorisation and the general Guidance Notes on off-label uses before using it (available at Extension of Authorisation - Search Page ([pesticides.gov.uk](https://www.pesticides.gov.uk))).

Pesticides no longer authorised

Pesticide product authorisations may be reviewed, amended, suspended or revoked at any time. Several pesticides are withdrawn each year. It is an offence to use a pesticide which is no longer authorised. To check if a pesticide product is still authorised, or is under revocation, take a note of the MAPP number from the label, then go to Pesticides Register of Authorised Plant Protection Products.

Arable

Introduction

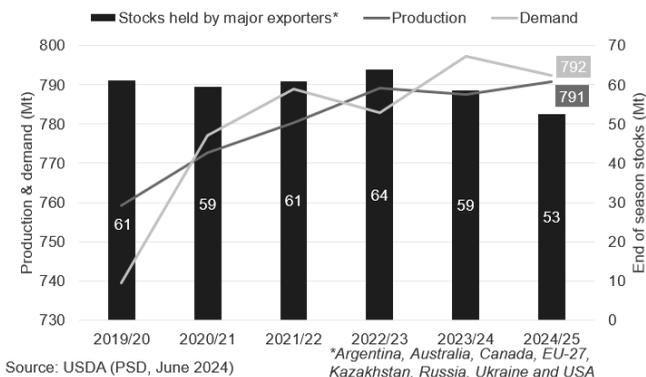
Markets and price drivers

The forecast for global cereal production in 2024 is estimated at 2,854 Mt, up fractionally from 2023 and marking a new all-time high. The increase reflects improved prospects for coarse grains, with the world production forecast at 1,530 Mt. The bolstered outlook for coarse grains largely rests on better production expectations for maize harvests in U.S, Argentina and Brazil. Nevertheless, Brazil's output is still anticipated to fall well short of the record of 2023. Forecasts for maize production are also raised for Ukraine and cumulatively these gains more than offset downgrades to production in eastern Asia and Southern Africa

Figure 1 represents the global wheat market. The USDA's summer wheat report estimates that Canada, the US, Argentina, and Australia will produce an additional 14 Mt of wheat in 2024, which will offset the anticipated 15 Mt drop in production from the EU and Black Sea regions. This is expected to heighten competition and drive more aggressive pricing in key export markets, creating a bearish outlook for global wheat markets and domestic prices. US wheat production is expected to increase by 55 Mt, a 10 Mt increase from the previous three-year average. The market going forward will thus consider both the negative impact of this rising US wheat stock combined with aggressive Russian wheat sales and factor in the upside potential to price from reduced EU production and associated EU quality concerns. The US will need to find new markets for their surplus, and US wheat prices are reflecting this shift. We may see stronger export figures from the US, including greater sales to "unusual" destinations like Europe or North Africa.

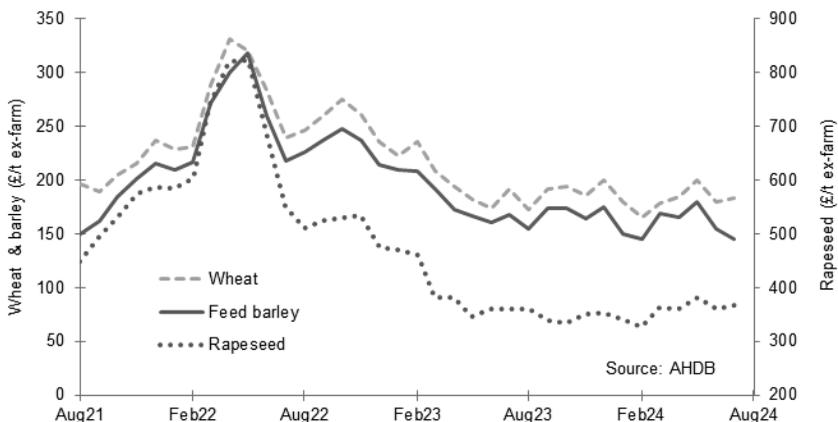
Overall, global markets should be well-supplied this season, with export surpluses more evenly distributed among various regions. Even if production decreases in Europe, the UK, Russia, and /or Ukraine, domestic prices may not rise automatically due to the relative ease with which grain ships between continents.

Figure 1 – Global Wheat Market



Despite a large carry in stock of wheat (3Mt), the UK will need to import large quantities of higher protein wheat in 2024/25 to offset the anticipated lower 2024 harvest output, estimated at 11-12Mt. This scenario will likely stimulate higher domestic wheat prices (figure 2) to attract imports. On the other hand, with the largest ending stocks of feed barley in several years, the UK will continue to be a net exporter of feed barley. Therefore, UK barley prices must remain low enough to stay competitive in the export market, particularly to Spain and Portugal.

Figure 2 – UK grain and oilseed prices (£/t ex-farm)



The EU-27+UK rapeseed crop is forecast at 19.4Mt down from last year's rapeseed crop of 21.4Mt. Of that, the UK is expecting to harvest 0.85Mt, less than half the annual UK crush requirement of 2Mt.

Livestock feed followed by milling, malting, distilling and exports are the main UK markets for wheat and barley. In Scotland, the whisky sector uses around half of total Scottish grain output.

The UK produces about 1 million tonnes of oats annually with usage dominated by the oat milling sector. Use as an animal feed depends on comparative barley price for ration inclusion. Oats have a high fibre content which is useful for ruminant diets and horses but not suitable for poultry.

Marketing

Achieving a satisfactory grain price is essential for profitable cereal production. Grain and oilseed producers benefit from well-developed futures markets which make for transparent pricing and enable crops to be bought and sold up to two years ahead of harvest. Given that prices readily swing by over £100/t between seasons, arable farmers should consider spreading sales to achieve a satisfactory average. It is essential

that arable farmers set their own target prices based on their costs and margin requirements.

Premium crops such as malting barley and milling oats are generally grown on contract as there can be little or no spot trade at harvest, particularly in Scotland. Contract conditions vary widely but will require that specific standards are attained such as moisture, germination, nitrogen levels and screenings. Many contracts offer growers flexibility in the pricing, through use of min-max or LIFFE wheat futures as a base.

Margins

Crop returns are highly sensitive to the yield and market price. Differences in fixed costs, particularly machinery, can have the greatest impact on profitability while variations in input costs such as fertiliser and sprays are relatively small between farms. Higher straw prices in the north and west can result in a good return from straw than in otherwise more marginal cereal cropping areas. Straw prices have been strong in recent years boosting returns across Scotland.

Variety choice

Crop varieties should be selected to match the farm conditions, the chosen agronomic strategy and intended end use. In Scotland for example, 90% of wheat grown is for distilling requiring soft endosperm characteristics. Feed markets are less demanding but may require some parameters to be met such as minimum specific weight. For home use other characteristics such as straw length can be important. Premium markets such as malting barley and milling wheat have very specific requirements and growers need to refer to the lists of approved varieties.

See links to relevant market and variety information:

Scottish varieties:

<https://www.sruc.ac.uk/media/4qybv20b/sruc-cereals-recommended-list-2024-tables-winter-edition-w1.pdf>

UK recommended lists:

<https://ahdb.org.uk/knowledge-library/recommended-lists-for-cereals-and-oilseeds-rl>

Malting requirements and varieties: www.ukmalt.com/

Milling requirements: www.nabim.org.uk/wheat/wheat-varieties/

Subsidies and support

For details of the latest subsidy arrangements see the Rural Aid Scheme section on page 467.

Wheat - Winter

PHYSICAL DATA

(a) Seed

Certified seed second generation (C2) sown at 230 kg/ha (1.83 cwt/acre).

(b) Fertiliser

200 : 67 : 83 kg/ha N : P₂O₅ : K₂O (160 : 54 : 66 units/acre). See page 4 for more information on nutrient planning.

(c) Sprays

Herbicides Autumn residual herbicide to control annual meadow grass and broad leaved weeds and one herbicide in spring.

Fungicides Four fungicide applications at GS25-30, GS31-32, GS39 and GS59 to cover eyespot, septoria and head diseases, including growth regulation.

Additional treatments to the basic programme could include:

Take all £180/t for seed treatment.

Mildew £15.50/ha

Aphids £6.51/ha

Wild oats £32.50/ha

Slugs £11.40/ha

Annual meadow grass £27.74/ha per application.

Black grass £52.00/ha (spring control).

Bromes £41.50/ha

Desiccant £6.80/ha

(d) Other crop expenses

For baling straw, costs for net wrap at £1.10/bale for large round straw bales average weight 200kg are included. Omit Other expenses costs if selling straw in the bout.

Additives can be used to preserve moist grain for feeding livestock. Cost will vary depending on product, length of storage period and moisture content at treatment. Alkaline grain treatments (for grain harvested at 16-22% moisture for long term storage), add £35/t. Propionic acid treatments (for grain harvested at 18-20% moisture for long term storage), add £15-20/t. Prices are subject to change at short notice. Treatment costs exclude grain processing and straw tubelining (see pages 380-381 for these costs).

Wheat - Winter

GROSS MARGIN DATA

Grain yield: t/ha (t/acre)	7.0	(2.8)	8.5	(3.4)	10.0	(4.0)
Straw yield: t/ha (t/acre)	3.2	(1.3)	4.2	(1.7)	5.2	(2.1)
OUTPUT			£/ha (acre)			
Grain @ £190/t*	1,330		1,615		1,900	
Straw @ £70/t	224		291		364	
	<u>1,554</u>	(629)	<u>1,906</u>	(771)	<u>2,264</u>	(916)
VARIABLE COSTS						
Seed @ £536/t	123		123		123	
Fertiliser	310		310		310	
Sprays	172		172		172	
Other expenses	16		21		26	
	<u>621</u>	(251)	<u>626</u>	(253)	<u>631</u>	(255)
GROSS MARGIN	<u>933</u>	(378)	<u>1,280</u>	(518)	<u>1,633</u>	(661)

GRAIN PRICE SENSITIVITY

£170 /t	793	(321)	1,110	(449)	1,433	(580)
£205 /t	1,038	(420)	1,408	(570)	1,783	(722)
£220 /t	1,143	(463)	1,535	(621)	1,933	(782)

* Feed price (milling premium £15-40/t, biscuit premium £5-15/t)

Basis of data:

Sale price estimate for 2025 harvest, November ex-farm spot price at 15% moisture content and average quality. Straw sold baled, ex-farm price estimate for arable areas.

Wheat - Spring

PHYSICAL DATA

(a) Seed

Certified seed second generation (C2) sown at 220 kg/ha (1.75 cwt/acre).

(b) Fertiliser

150 : 52 : 71 kg/ha N : P₂O₅ : K₂O (136 : 42 : 57 units/acre). See page 4 for more information on nutrient planning.

(c) Sprays

Herbicides One application for spring germinating broadleaved weeds.

Fungicides Two applications for leaf diseases at GS31-32 and GS39-49.

Additional sprays to the basic programme could include:

Mildew £15.50/ha

Wild oats £29.25/ha

Desiccant £6.80/ha

(d) Other crop expenses

For baling straw, costs for net wrap at £1.10/bale for large round straw bales average weight 200kg are included. Omit Other expenses costs if selling straw in the bout.

Additives can be used to preserve moist grain for feeding livestock. Cost will vary depending on product, length of storage period and moisture content at treatment. Alkaline grain treatments (for grain harvested at 16-22% moisture for long term storage), add £35/t. Propionic acid treatments (for grain harvested at 18-20% moisture for long term storage), add £15-20/t. Prices are subject to change at short notice. Treatment costs exclude grain processing and straw tubelining (see pages 380-381 for these costs).

Wheat - Spring

GROSS MARGIN DATA

Grain yield: t/ha (t/acre)	4.5	(1.8)	6.5	(2.6)	8.5	(3.4)
Straw yield: t/ha (t/acre)	2.5	(1.0)	3.6	(1.4)	4.7	(1.9)
OUTPUT			£/ha (acre)			
Grain @ £190/t*	855		1,235		1,615	
Straw @ £70/t	174		251		328	
	<u>1,029</u>	(416)	<u>1,486</u>	(601)	<u>1,943</u>	(786)
VARIABLE COSTS						
Seed @ £635/t	140		140		140	
Fertiliser	240		240		240	
Sprays	63		63		63	
Other expenses	12		18		23	
	<u>455</u>	(184)	<u>461</u>	(187)	<u>466</u>	(189)
GROSS MARGIN	<u>574</u>	(232)	<u>1,025</u>	(414)	<u>1,477</u>	(597)

GRAIN PRICE SENSITIVITY

£170 /t	484	(196)	895	(362)	1,307	(529)
£205 /t	641	(259)	1,123	(454)	1,604	(649)
£220 /t	709	(287)	1,220	(494)	1,732	(701)

* Feed price (milling premium £15-40/t, biscuit premium £5-15/t)

Basis of data:

Sale price estimate for 2025 harvest, November ex-farm spot price at 15% moisture content and average quality. Straw sold baled, ex-farm price estimate for arable areas.

Barley - Winter

PHYSICAL DATA

(a) Seed

Certified seed second generation (C2) sown at 220 kg/ha (1.75 cwt/acre). Alternatively, hybrid 6 row sown at 145 kg/ha (1.16cwt/ac). Conventional seed price used.

(b) Fertiliser

180 : 67 : 83 kg/ha N : P₂O₅ : K₂O (144 : 54 : 66 units/acre). See page 4 for more information on nutrient planning.

(c) Sprays

Herbicides Autumn residual herbicide to control annual meadow grass and broad leaved weeds and one herbicide in spring.

Fungicides Three fungicide applications at GS25-30, GS31 and GS49 for rhynchosporium, mildew and other leaf diseases.

Additional sprays to the basic programme could include:

Wild oats £32.67/ha

Aphids £6.51/ha

Desiccant £6.80/ha

(d) Other crop expenses

For baling straw, costs for net wrap at £1.10/bale for large round straw bales average weight 200kg are included. Omit Other expenses costs if selling straw in the bout.

Additives can be used to preserve moist grain for feeding livestock. Cost will vary depending on product, length of storage period and moisture content at treatment. Alkaline grain treatments (for grain harvested at 16-22% moisture for long term storage), add £35/t. Propionic acid treatments (for grain harvested at 18-20% moisture for long term storage), add £15-20/t. Prices are subject to change at short notice. Treatment costs exclude grain processing and straw tubelining (see pages 380-381 for these costs).

Barley - Winter

GROSS MARGIN DATA

Grain yield: t/ha (t/acre)	6.0	(2.4)	7.5	(3.0)	9.0	(3.6)
Straw yield: t/ha (t/acre)	3.3	(1.3)	4.1	(1.7)	5.0	(2.0)
OUTPUT			£/ha (acre)			
Grain @ £170/t*	1,020		1,275		1,530	
Straw @ £80/t	264		330		396	
	<u>1,284</u>	(520)	<u>1,605</u>	(650)	<u>1,926</u>	(779)
VARIABLE COSTS						
Seed @ £503/t	111		111		111	
Fertiliser	291		291		291	
Sprays	113		113		113	
Other expenses	17		21		25	
	<u>532</u>	(215)	<u>536</u>	(217)	<u>540</u>	(218)
GROSS MARGIN	<u>753</u>	(305)	<u>1,069</u>	(433)	<u>1,386</u>	(561)

GRAIN PRICE SENSITIVITY

£150 /t	633	(256)	919	(372)	1,206	(488)
£185 /t	843	(341)	1,182	(478)	1,521	(616)
£200 /t	933	(378)	1,294	(524)	1,656	(670)

* Feed price (malting price approx. £10-20/t higher)

Basis of data:

Sale price estimate for 2025 harvest, November ex-farm spot price at 15% moisture content and average quality. Straw sold baled, ex-farm price estimate for arable areas.

Barley - Spring

PHYSICAL DATA

(a) Seed

Certified seed second generation (C2) sown at 190 kg/ha (1.51 cwt/acre).

(b) Fertiliser

130 : 52 : 71 kg/ha N : P₂O₅ : K₂O (104 : 42 : 57 units/acre). See page 4 for more information on nutrient planning.

(c) Sprays

Herbicides Post emergence herbicide to control broadleaved weeds.

Fungicides Two applications at GS31 and GS45 for rhynchosporium, mildew and other leaf diseases.

Additional sprays to the basic programme could include:

Mildew £14.50/ha

Wild oats £26.00/ha

Aphids £6.51/ha

Desiccant £6.80/ha

(d) Other crop expenses

For baling straw, costs for net wrap at £1.10/bale for large round straw bales average weight 200kg are included. Omit Other expenses costs if selling straw in the bout.

Additives can be used to preserve moist grain for feeding livestock. Cost will vary depending on product, length of storage period and moisture content at treatment. Alkaline grain treatments (for grain harvested at 16-22% moisture for long term storage), add £35/t. Propionic acid treatments (for grain harvested at 18-20% moisture for long term storage), add £15-20/t. Prices are subject to change at short notice. Treatment costs exclude grain processing and straw tubelining (see pages 380-381 for these costs).

Barley - Spring

GROSS MARGIN DATA

Grain yield: t/ha (t/acre)	4.0	(1.6)	5.5	(2.2)	7.5	(3.0)
Straw yield: t/ha (t/acre)	2.1	(0.8)	2.9	(1.2)	3.9	(1.6)
OUTPUT			£/ha (acre)			
Grain @ £170/t*	680		935		1,275	
Straw @ £80/t	166		229		312	
	<u>846</u>	(342)	<u>1,164</u>	(471)	<u>1,587</u>	(642)
VARIABLE COSTS						
Seed @ £543/t	103		103		103	
Fertiliser	220		220		220	
Sprays	65		65		65	
Other expenses	10		14		20	
	<u>398</u>	(161)	<u>402</u>	(163)	<u>408</u>	(165)
GROSS MARGIN	<u>448</u>	(181)	<u>762</u>	(308)	<u>1,180</u>	(477)

GRAIN PRICE SENSITIVITY

£150 /t	368	(149)	652	(264)	1,030	(417)
£185 /t	508	(206)	844	(342)	1,292	(523)
£200 /t	568	(230)	927	(375)	1,405	(569)

* Feed price (malting price approx. £15-50/t higher)

Basis of data:

Sale price estimate for 2025 harvest, November ex-farm spot price at 15% moisture content and average quality. Straw sold baled, ex-farm price estimate for arable areas.

Oats - Winter

PHYSICAL DATA

(a) Seed

Certified seed second generation (C2) sown at 190 kg/ha (1.51 cwt/acre).

(b) Fertiliser

140 : 53 : 104 kg/ha N : P₂O₅ : K₂O (112 : 42 : 83 units/acre). See page 4 for more information on nutrient planning.

(c) Sprays

Herbicides Autumn residual herbicide to control annual meadow grass and broad leaved weeds and one herbicide in spring.

Fungicides Two sprays for mildew and crown rust at GS31 and GS49 including growth regulation.

(d) Other crop expenses

For baling straw, costs for net wrap at £1.10/bale for large round straw bales average weight 200kg are included. Omit Other expenses costs if selling straw in the bout.

Additives can be used to preserve moist grain for feeding livestock. Cost will vary depending on product, length of storage period and moisture content at treatment. Alkaline grain treatments (for grain harvested at 16-22% moisture for long term storage), add £35/t. Propionic acid treatments (for grain harvested at 18-20% moisture for long term storage), add £15-20/t. Prices are subject to change at short notice. Treatment costs exclude grain processing and straw tubelining (see pages 380-381 for these costs).

Oats - Winter

GROSS MARGIN DATA

Grain yield: t/ha (t/acre)	5.0	(2.0)	7.5	(3.0)	9.0	(3.6)
Straw yield: t/ha (t/acre)	3.2	(1.3)	4.7	(1.9)	5.7	(2.3)
OUTPUT			£/ha (acre)			
Grain @ £180/t*	900		1,350		1,620	
Straw @ £70/t	221		331		397	
	<u>1,121</u>	(454)	<u>1,681</u>	(680)	<u>2,017</u>	(816)
VARIABLE COSTS						
Seed @ £559/t	106		106		106	
Fertiliser	251		251		251	
Sprays	74		74		74	
Other expenses	16		24		28	
	<u>447</u>	(181)	<u>455</u>	(184)	<u>459</u>	(186)
GROSS MARGIN	<u>674</u>	(273)	<u>1,226</u>	(496)	<u>1,558</u>	(630)

GRAIN PRICE SENSITIVITY

£160 /t	574	(232)	1,076	(435)	1,378	(558)
£195 /t	749	(303)	1,339	(542)	1,693	(685)
£210 /t	824	(333)	1,451	(587)	1,828	(740)

* Milling price

Basis of data:

Sale price estimate for 2025 harvest, November ex-farm spot price at 15% moisture content and average quality. Straw sold baled, ex-farm price estimate for arable areas.

Oats - Spring

PHYSICAL DATA

(a) Seed

Certified seed second generation (C2) sown at 190 kg/ha (1.51 cwt/acre).

(b) Fertiliser

100 : 53 : 104 kg/ha N : P₂O₅ : K₂O (80 : 42 : 83 units/acre). See page 4 for more information on nutrient planning.

(c) Sprays

Herbicides Typical weed control for annual broadleaved weeds.

Fungicides Two sprays at GS25-30 and GS49 for mildew and crown rust including growth regulator.

(d) Other crop expenses

For baling straw, costs for net wrap at £1.10/bale for large round straw bales average weight 200kg are included. Omit Other expenses costs if selling straw in the bout.

Additives can be used to preserve moist grain for feeding livestock. Cost will vary depending on product, length of storage period and moisture content at treatment. Alkaline grain treatments (for grain harvested at 16-22% moisture for long term storage), add £35/t. Propionic acid treatments (for grain harvested at 18-20% moisture for long term storage), add £15-20/t. Prices are subject to change at short notice. Treatment costs exclude grain processing and straw tubelining (see pages 380-381 for these costs).

Oats - Spring

GROSS MARGIN DATA

Grain yield: t/ha (t/acre)	4.0	(1.6)	5.5	(2.2)	7.5	(3.0)
Straw yield: t/ha (t/acre)	2.1	(0.8)	3.0	(1.2)	3.9	(1.6)
OUTPUT			£/ha (acre)			
Grain @ £180/t*	720		990		1,350	
Straw @ £70/t	147		210		273	
	<u>867</u>	(351)	<u>1,200</u>	(486)	<u>1,623</u>	(657)
VARIABLE COSTS						
Seed @ £580/t	110		110		110	
Fertiliser	212		212		212	
Sprays	61		61		61	
Other expenses	11		15		20	
	<u>394</u>	(159)	<u>398</u>	(161)	<u>403</u>	(163)
GROSS MARGIN	<u>474</u>	(192)	<u>802</u>	(325)	<u>1,221</u>	(494)

GRAIN PRICE SENSITIVITY

£160 /t	394	(159)	692	(280)	1,071	(433)
£195 /t	534	(216)	885	(358)	1,333	(539)
£210 /t	594	(240)	967	(391)	1,446	(585)

* Milling price

Basis of data:

Sale price estimate for 2025 harvest, November ex-farm spot price at 15% moisture content and average quality. Straw sold baled, ex-farm price estimate for arable areas.

Triticale

PHYSICAL DATA

(a) Seed

230 kg/ha (1.83 cwt/acre).

(b) Fertiliser

180 : 52 : 71 kg/ha N : P₂O₅ : K₂O (144 : 42 : 57 units/acre). See page 4 for more information on nutrient planning.

(c) Sprays

Herbicides Pre-emergence application.

Fungicides Two sprays at GS31 and GS39-45 including growth regulation.

(d) Other crop expenses

For baling straw, costs for net wrap at £1.10/bale for large round straw bales average weight 200kg are included. Omit Other expenses costs if selling straw in the bout.

Triticale

GROSS MARGIN DATA

Grain yield: t/ha (t/acre)	4.0	(1.6)	6.0	(2.4)	8.0	(3.2)
Straw yield: t/ha (t/acre)	2.6	(1.1)	3.9	(1.6)	5.2	(2.1)
OUTPUT			£/ha (acre)			
Grain @ £190/t	760		1,140		1,520	
Straw @ £70/t	182		273		364	
	<u>942</u>	(381)	<u>1,413</u>	(572)	<u>1,884</u>	(762)
VARIABLE COSTS						
Seed @ £595/t	137		137		137	
Fertiliser	268		268		268	
Sprays	65		65		65	
Other expenses	13		20		26	
	<u>483</u>	(195)	<u>490</u>	(198)	<u>496</u>	(201)
GROSS MARGIN	<u>459</u>	(186)	<u>924</u>	(374)	<u>1,388</u>	(561)

GRAIN PRICE SENSITIVITY

£170 /t	379	(153)	804	(325)	1,228	(497)
£205 /t	519	(210)	1,014	(410)	1,508	(610)
£220 /t	579	(234)	1,104	(447)	1,628	(659)

Basis of data:

Sale price estimate for 2025 harvest, November ex-farm spot price at 15% moisture content and average quality. Straw sold baled, ex-farm price estimate for arable areas.

Oilseed Rape - Winter

PHYSICAL DATA

(a) Seed

Oil	45%
Seed rate	Hybrid - 4kg/ha : Conventional - 5kg/ha Conventional seed price used.

(b) Fertiliser

200 : 49 : 38 + 75 kg/ha N : P₂O₅ : K₂O + SO₃
(160 : 39 : 30 + 60 units/acre). See page 4 for more information on nutrient planning.

(c) Sprays

Herbicides Pre-emergence herbicide to control annual meadow grass and broadleaved weeds.

Fungicides Autumn and spring fungicides for sclerotinia, light leaf spot or phoma.

Desiccation Desiccation, including the use of a pod-sealant, has largely replaced swathing. If swathing is used over desiccation, reduce spray costs by £14.00/ha. For swathing costs see page 380.

Additional sprays to the basic programme could include:

Slugs £11.40/ha per application.

Sclerotinia £55.69/ha (high risk situations)

Rape winter stem weevil and pollen beetle £7.75/ha

Volunteer cereals £10.68/ha

Mayweed £28.35/ha

(d) Other crop expenses

Assuming straw has been chopped. If baling, include costs for net wrap at £1.10/bale for round straw bales, average weight 200 kg.

Oilseed Rape - Winter

GROSS MARGIN DATA

Grain yield: t/ha (t/acre)	3.0	(1.2)	4.0	(1.6)	5.0	(2.0)
Straw yield: t/ha (t/acre)	-	(0.0)	-	(0.0)	-	(0.0)
OUTPUT			£/ha (acre)			
Grain @ £370/t	1,110		1,480		1,850	
Straw @ £0/t	-		-		-	
	<u>1,110</u>	(449)	<u>1,480</u>	(599)	<u>1,850</u>	(749)
VARIABLE COSTS						
Seed @ £16/kg	80		80		80	
Fertiliser	265		265		265	
Sprays	164		164		164	
Other expenses	-		-		-	
	<u>509</u>	(206)	<u>509</u>	(206)	<u>509</u>	(206)
GROSS MARGIN	<u>601</u>	(243)	<u>971</u>	(393)	<u>1,341</u>	(543)

GRAIN PRICE SENSITIVITY

£320 /t	451	(183)	771	(312)	1,091	(442)
£420 /t	751	(304)	1,171	(474)	1,591	(644)
£470 /t	901	(365)	1,371	(555)	1,841	(745)

Basis of data:

Sale price estimate for 2025 harvest, November ex-farm price including oil bonus. An average oil content of 43% has been assumed resulting in a bonus of 4.5% above the base price. The oil bonus comprises a 1.5% increase in the price for every 1% rise in oil content above 40%.

Oilseed Rape - Spring

PHYSICAL DATA

(a) Seed

Oil	45%
Seed rate	5 kg/ha

(b) Fertiliser

100 : 28 : 22 + 40 kg/ha N : P₂O₅ : K₂O + SO₃
(80 : 22 : 18 + 32 units/acre). See page 4 for more information on nutrient planning.

(c) Sprays

Herbicides Pre-emergence herbicide for problem weeds such as shepherds' purse.

Fungicides One spray to control pollen beetle.

Desiccation Desiccation has largely replaced swathing. If swathing is used over desiccation, reduce spray costs by £14.00/ha. For swathing costs see page 380.

Additional sprays to the basic programme could include:

Volunteer cereals £10.68/ha

Sclerotinia £48.40/ha

Pod sticker £8.40/ha

(d) Other crop expenses

Assuming straw has been chopped. If baling, include costs for net wrap at £1.10/bale for round straw bales, average weight 200 kg.

Oilseed Rape - Spring

GROSS MARGIN DATA

GROSS MARGIN DATA

Grain yield: t/ha (t/acre)	1.8	(0.7)	2.5	(1.0)	3.0	(1.2)
Straw yield: t/ha (t/acre)	-	(0.0)	-	(0.0)	-	(0.0)

OUTPUT

	£/ha (acre)					
Grain @ £370/t	666		925		1,110	
Straw @ £0/t	-		-		-	
	<u>666</u>	(270)	<u>925</u>	(374)	<u>1,110</u>	(449)

VARIABLE COSTS

Seed @ £27/kg	135		135		135	
Fertiliser	138		138		138	
Sprays	59		59		59	
Other expenses	-		-		-	
	<u>332</u>	(134)	<u>332</u>	(134)	<u>332</u>	(134)

GROSS MARGIN	<u>334</u>	(136)	<u>593</u>	(240)	<u>778</u>	(315)
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GRAIN PRICE SENSITIVITY

£320 /t	244	(99)	468	(189)	628	(254)
£420 /t	424	(172)	718	(291)	928	(376)
£470 /t	514	(208)	843	(341)	1,078	(436)

Basis of data:

Sale price estimate for 2025 harvest, November ex-farm price including oil bonus. An average oil content of 43% has been assumed resulting in a bonus of 4.5% above the base price. The oil bonus comprises a 1.5% increase in the price for every 1% rise in oil content above 40%.

Spring Field Beans

PHYSICAL DATA

(a) Seed

250 kg/ha (1.99 cwt/acre).

(b) Fertiliser

0 : 40 : 40 kg/ha N : P₂O₅ : K₂O (0 : 32 : 32 units/acre). See page 4 for more information on nutrient planning.

(c) Sprays

Herbicides Pre-emergence herbicide and control of annual meadow grass and broadleaved weeds.

Fungicide Two applications to control chocolate spot and downy mildew.

Desiccation Cost included.

(d) Other crop expenses

Additives can be used to preserve pulses for feeding livestock. Cost will vary depending on product used, length of storage period and moisture of pulses at treatment. For pulses harvested at 20% moisture for long term storage, add £9-13/t grain treated with propionic acid, excluding processing (see page 380 for processing costs).

Spring Field Beans

GROSS MARGIN DATA

Grain yield: t/ha (t/acre)	2.5	(1.0)	4.5	(1.8)	5.5	(2.2)
OUTPUT	£/ha (acre)					
Grain @ £240/t	600		1,080		1,320	
	<u>600</u>	(243)	<u>1,080</u>	(437)	<u>1,320</u>	(534)
VARIABLE COSTS						
Seed @ £600/t	150		150		150	
Fertiliser	71		71		71	
Sprays	157		157		157	
Other expenses	-		-		-	
	<u>378</u>	(153)	<u>378</u>	(153)	<u>378</u>	(153)
GROSS MARGIN	<u>222</u>	(90)	<u>702</u>	(284)	<u>942</u>	(381)

GRAIN PRICE SENSITIVITY

£210 /t	147	(59)	567	(229)	777	(314)
£255 /t	260	(105)	770	(312)	1,025	(415)
£270 /t	297	(120)	837	(339)	1,107	(448)

Basis of data:

Sale price estimate 2025 harvest, November ex-farm price. Deductions for field beans, which do not meet minimum quality standards, can reduce the price considerably.

Spring Peas

PHYSICAL DATA

(a) Seed

250 kg/ha (1.99 cwt/acre).

White/Large Blue Compounding Pea

(b) Fertiliser

0 : 20 : 30 kg/ha N : P₂O₅ : K₂O (0 : 16 : 24 units/acre). See page 4 for more information on nutrient planning.

(c) Sprays

Herbicides A pre-emergence herbicide to control annual and broadleaved weeds.

Fungicide Two sprays at flowering for downy mildew and botrytis control.

Insecticide Aphid control.

Desiccation A desiccant is included.

(d) Other crop expenses

Additives can be used to preserve pulses for feeding livestock. Cost will vary depending on product used, length of storage period and moisture of pulses at treatment. For pulses harvested at 20% moisture for long term storage, add £9-13/t grain treated with propionic acid, excluding processing (see page 380 for processing costs).

Spring Peas

GROSS MARGIN DATA

Grain yield: t/ha (t/acre)	2.5	(1.0)	4.0	(1.6)	5.5	(2.2)
OUTPUT	£/ha (acre)					
Grain @ £255/t	638		1,020		1,403	
	<u>638</u>	(258)	<u>1,020</u>	(413)	<u>1,403</u>	(568)
VARIABLE COSTS						
Seed @ £640/t	160		160		160	
Fertiliser	38		38		38	
Sprays	120		120		120	
Other expenses	-		-		-	
	<u>318</u>	(129)	<u>318</u>	(129)	<u>318</u>	(129)
GROSS MARGIN	<u>320</u>	(129)	<u>702</u>	(284)	<u>1,085</u>	(439)

GRAIN PRICE SENSITIVITY

£225 /t	245	(99)	582	(236)	920	(372)
£270 /t	357	(144)	762	(308)	1,167	(472)
£285 /t	395	(160)	822	(333)	1,250	(506)

Basis of data:

Sale price estimate for 2025 harvest, November ex-farm price. Deductions for protein peas, which do not meet minimum quality standards, can reduce the price considerably. Bad weather at harvest can result in very high loss levels.

Timothy - Hay, Greencut

PHYSICAL DATA

(a) System

As practised on the Carse of Stirling and Clackmannan.

(b) Yield

Average between 7 t/ha (2.8 t/acre) and 8 t/ha (3.2 t/acre) with some aftermath grazing (or alternatively round bale silage).

Price rises usually as the season progresses but hay also loses weight with storage - as much as 15% over a winter, depending upon the conditions of storage.

(c) Seed

Annual charge: assumes a 10-year sward life and that 'Basic' seed will be sown to keep open the option of a seed crop.

Seed rate: 13-18 kg/ha.

(d) Fertiliser

Standard practice would see only N applied annually, usually as sulphate of ammonia, supported by periodic dressings of phosphate and potash.

The fertiliser costs overleaf consider an application of the rates below.

See page 4 for more information on nutrient planning.

kg/ha (units/acre)	Average	Premium
N	80 (64)	120 (96)
P ₂ O ₅ (annual allocation)	40 (32)	50 (40)
K ₂ O	48 (38)	60 (48)

(e) Sprays

Annual nominal charge to cover a range of circumstances.

(f) Other crop expenses

Net wrap cost is costed on the basis of 5-6 round bales/t and assuming one roll of net will wrap 410 bales.

Timothy - Hay, Greencut

GROSS MARGIN DATA

Average yield: t/ha (acre)	7.0	(2.8)	8.0	(3.2)
OUTPUT		£/ha (acre)		
Hay (ex-field or early store) @ £130/t	910		1,040	
Aftermath grazing let @ £40/ha	40		40	
	<u>950</u>	(384)	<u>1,080</u>	(437)
VARIABLE COSTS				
Seed (annual charge)	13		13	
Fertiliser	146		202	
Sprays (annual charge)	6		6	
Other expenses	13		15	
	<u>178</u>	(72)	<u>236</u>	(95)
GROSS MARGIN	<u>772</u>	(312)	<u>844</u>	(342)

Stubble to Stubble Arable Operations

The costs of stubble to stubble operations for winter wheat, winter barley, spring barley and winter oilseed rape are illustrated below. These calculations should be adapted and adjusted for site specific circumstances.

Assumptions:

- Yield data taken from crop gross margins on pages 21, 25, 27 and 35.
- All straw is assumed to be baled.
- Contractors assumed to undertake all cultivation, sowing, crop maintenance, harvesting and carting to store. See pages 379-382 for contractor costs.
- Fuel cost itemised separately to contractors charges. Machinery fuel use (l/ha) and fuel cost on page 376-377.
- Drying costs based on costs on pages 382-383.

	Winter wheat	Winter barley	Spring barley	Winter OSR
Yield - grain (t /ha)	8.0	7.5	5.5	4.0
Yield - straw (t /ha)	4.2	4.1	2.9	-
Grain MC at harvest (%)	18	17	15	10
	£/ha			
Cultivation costs				
<i>Plough and cultivate</i>	138	138	138	138
<i>Sow</i>	42	42	42	42
<i>Roll and destone</i>	23	23	23	23
<i>Spray</i>	77	61	46	61
<i>Fertilise</i>	37	25	25	25
<i>Fuel</i>	53	51	50	51
	370	340	323	340
Harvest costs				
<i>Harvest</i>	109	109	109	101
<i>Bale/stack</i>	83	81	57	-
<i>Carting</i>	8	12	8	4
<i>Dry grain</i>	61	43	10	15
<i>Fuel</i>	17	15	13	9
	277	259	198	129
Total cost (£/ha)	647	599	521	469
Total cost (£/ac)	262	242	211	190
Cost per t grain (£/t)	81	80	95	117

Equivalent Grain Weights at Varying Moisture Contents

The formula for converting wet grain weight to dry grain weight is:

$$\text{Weight loss} = \frac{W_1 (M_1 - M_2)}{100 - M_2}$$

where: W_1 = starting weight of grain.
 M_1 = starting moisture of grain.
 M_2 = final moisture of grain.

This formula accounts only for weight change due to moisture loss only.

100t at Moisture Content %	Final moisture content %								
	20	19	18	17	16	15	14	13	12
	Dried grain - t								
35	81.25	80.25	79.27	78.31	77.38	76.47	75.58	74.71	73.86
33	83.75	82.72	81.71	80.72	79.76	78.82	77.91	77.01	76.14
31	86.25	85.18	84.15	83.13	82.14	81.18	80.23	79.31	78.41
29	88.75	87.65	86.59	85.54	84.52	83.53	82.56	81.41	80.68
27	91.25	90.12	89.02	87.95	86.90	85.88	84.88	83.91	82.95
25	93.75	92.59	91.46	90.36	89.29	88.24	87.21	86.21	85.22
23	96.25	95.06	93.90	92.77	91.67	90.59	89.53	88.51	87.50
21	98.75	97.53	96.34	95.18	94.05	92.94	91.86	90.80	89.77
19	-	100.00	98.78	97.59	96.43	95.30	94.19	93.10	92.41
17	-	-	-	100.00	98.81	97.65	96.51	95.40	94.32
15	-	-	-	-	-	100.00	98.84	97.70	96.59

Further information on storage requirements for grain can be found on page 407, costs of grain storage are found on page 405, and costs of grain drying on page 382-383.

Futures and Options Markets

The futures markets offer a means to manage price risk in a wide range of agricultural commodities. In the UK, the most relevant markets are the UK LIFFE feed wheat futures (www.theice.com) and the Paris European Rapeseed futures and Milling Wheat futures (www.euronext.com). Contracts for futures (forward prices) and options (price insurance) are available in both of these markets. Further details on the market, lists of registered brokers and how to trade can be found at the website above.

On a global basis, the most important agricultural futures market is the Chicago Board of Trade which offers contracts on wheat, maize, oats, soyabeans, soyameal and others, see www.cmegroup.com. AHDB Cereals and Oilseeds has detailed market information on their website and also provides a guide to price risk management, futures and options.

See: <https://ahdb.org.uk/cereals-oilseeds-markets>

Potatoes

Introduction

Markets and Price Drivers

Following the AHDB announcement in May 2021 to wind down their potato sector, there is much less UK specific potato market information available. The potato market in the UK is split between seed, ware for fresh market, and ware for processing. The feeling from many industry experts is that the total UK planted area could be around 100,000 hectares, producing around 4.7 million tonnes (source: World Potato Markets) The seed market continues to be impacted by Brexit, however the Windsor framework, which replaced the Northern Ireland protocol, permits free flowing movement of goods to Northern Ireland, including seed potatoes. In turn, progeny crop grown in Northern Ireland can be used to supply the Republic of Ireland the following year. At the time of writing, seed potatoes grown in UK are prohibited for export directly into the EU, although there are significant efforts to reopen the market.

As mentioned above, formal estimates of total planted area in GB are no longer available, however, after a year of undersupply and high demand, it's possible the ware area may increase somewhat. SASA publish statistics for seed crops entered for inspection in Scotland. In 2024, the area of seed entered for inspection is 10,256ha; this is an increase of 190ha from 2023. Last year, 486 hectares did not meet the requirements of the strict certification process, with aphid vectored viruses being the main threat. In Northern Europe, the North-western European Potato Growers (NEPG) reported that across Belgium, Germany, France, and Netherlands, the total potato area has increased by 4-6%. This would see a total increase of 100,000 hectares in Europe over the last ten years. The seed area in Europe, despite increasing pressure from processors offering lucrative contracts, is likely to increase in most countries with the Netherlands being the exception.

The number of potato producers in the UK has been on a steady decline over the last decade with ever-increasing costs of production. Nevertheless, larger growers have increased production limiting the decline in overall area. Although grain prices have increased back to levels similar to before the start of the Ukrainian war, there could still be a reduction in the number of farms growing potatoes as cereal prices make them an attractive option, notwithstanding, the slight increase in hectareage in Northern Europe.

Consumer Trends

According to Defra (January 2022), the quantity of potatoes purchased by households in 2019/20 decreased by 1.4% from 2018/19. This continues the steady decline in retail sales of potatoes. In the last 15 years, the consumption of fresh potatoes in UK households has steadily decreased (Statista, February 2022). This is mirrored by the potato industry where the general feeling is that there is a decline in consumption of fresh potatoes. In 2019/20, the average UK consumer consumed 355g of fresh

potatoes per week. In 2010, this figure was 501g and in 1974, when the data was first gathered by Defra, 1316g of fresh potatoes were consumed on average, per person, per week in the UK. Processed potatoes have gone the opposite way. In 1974, 119g of processed potatoes were consumed per person per week. In 2010, this had increased to 242g and by 2019/20, this rose to 256g (Source: Defra, Family Food Survey).

Previous research carried out by AHDB in 2018 found that one third of consumers do not enjoy cooking or have a basic to no level of culinary skills which could be one of the reasons for this reduction over time. Instead, consumers tend to look for quick and easy meals and according to AHDB, potatoes are perceived to be the third most convenient source of carbohydrates behind pasta and rice (Source: AHDB: Latest Retail and Consumer Insights on Potatoes, 2019).

Potato Market Performance

As mentioned, without AHDB as a source for potato market information, it is difficult to comment on potato sales for 2023/24. Other sources indicate processed products are becoming more popular. Statista report that in general, the sale of processed and preserved potatoes has consistently increased in recent years. Crisps have seen a small increase in their sales value over the last decade while frozen potato products have increased notably. Last year, most retail sales of potatoes in GB came from crisps. This market has been rising steadily over the past decade, a trend which is expected to continue in the years ahead. The UK imports around 800,000 tonnes of potatoes annually, mostly for processing, with the UK the second largest importer of potato products in Europe (source: World Potato Markets).

Marketing

Contracts have been a standard feature of the ware and processing market for a long time where factories need to procure supplies well in advance and ensure that their growers attain a sustainable price, particularly for those who are forward planning, or obtaining capital from the bank to support business expansion.

The fresh market is more volatile and complex with some growers utilising cold storage facilities to lengthen their supply season with the prospect of higher free-buy prices later in the season. In seasons of oversupply in the market, contracts have become more popular where growers have tried to lock down a proportion of their crop for a known price. However, in a season of undersupply, growers will typically hold onto uncontracted stocks as long as possible to negotiate higher prices. Season 2023/24 was a perfect example of this, with growers selling for extremely high prices on the free buy market, breaking record sales of up to £700/t for clean packing ware. The grower's hand is also strengthened in negotiations by producing potatoes free from damage, disease, and skin blemish, as aesthetics (skin finish) are a major selling point in the fresh potato sector. Size, tuber count, and dry matter content are more

important features for processing crops, clean skins are less of a concern.

The seed market is virtually all conducted under contract where growers multiply seed stocks in partnership with the seed houses. Seed potatoes must be entered into the SPCS (Seed Potatoes Classification Scheme), administered in Scotland by SASA and by APHA in England & Wales. Crops receive in-season inspections for diseases and faults. Growers must attain high standards of crop health, seed purity and hygiene, good yields of the correct size band and timely and accurate supply. Reputation and reliability will gain growers higher quality contracts. In recent times, there has been a move towards growers supplying some export markets directly, most notably to Egypt, Scotland's largest export market (57% seed by volume). With Egyptian customer representatives actively procuring seed on Scottish farms. This has led to more competition, less contracts and a rise in the export price. There is however increased risk for the grower in taking this route.

Margins

Crop returns are highly sensitive to the net (packed out) yield achieved which also affects the price. Attention to crop health and damage minimisation are therefore critical. Seed costs are variable with growers looking to multiply their own seed where they can – certified seed at high grades has a premium. Fertiliser costs can be adjusted according to the market with savings on nitrogen and potassium for new, salad and seed potato growers. Sprays are relatively uniform across the board, but fewer foliar applications are required for shorter season crops (seed and salads). The need for nematicides to combat Potato Cyst Nematode (PCN) is a significant outlay. Generally, there is limited scope to reduce pesticide inputs (particularly for late blight sprays). Differences in fixed costs, particularly machinery and labour, have the greatest impact on overall profitability.

Variety Choice

The most important factor when selecting a potato variety is suitability for the end market. For crisps, tubers with good shape, high dry matter, resistance to damage and yellow flesh are required. For chips, oval tubers with good uniformity and low reducing sugar content are best. For the fresh packing market, taste and resistance to disease causing skin blemishes are important. Although there are many potato varieties available, buyers often have restricted lists which limits grower choice.

Maris Piper is still the most popular potato variety in the UK, both in terms of ware and seed production. This demand is mainly driven by consumer awareness and loyalty to the brand name 'Maris Piper', as it is familiar with many consumers and is an all-round cooking variety which can be boiled, chipped, or roasted equally well.

The seed market is largely split into two sectors, export and home (GB) trade. Export largely attracts a premium, especially on free (expired breeders rights) varieties such as Cara and Hermes - though, subject to market supply and demand. The home trade market is largely supplied with protected varieties and although margins are reduced in comparison to export, the risk is also greatly reduced.

Crisping varieties such as Lady Rosetta and Brooke continue to be popular choices for customers such as PepsiCo (i.e. Walkers crisps), due to their high yields, processing capabilities and round, uniform shape.

King Russet is becoming popular within the processing sector due to its PCN resistance and white flesh suitable for the fast-food service market. Varieties such as Markies is well established within the fish and chip shop sector, due to its long dormancy and reduced oil uptake when frying.

Innovation within the salad market, has seen varieties such as Charlotte and Maris Peer reduce market share but remain popular as they can be boiled within 15 minutes without peeling and chopping, which makes them competitive with pasta and rice.

Resistance to pests and diseases is becoming increasingly important due to the loss of key chemical active ingredients. The most valuable traits are resistance to PCN (which also helps to reduce the viable population of PCN in the field), blackleg, powdery scab, and late blight. Gross yield as with wheat and barley is not as important as net/sold yield is to potatoes. Emphasis is on quality over quantity in the pursuit of profitability.

Unfortunately, the end market drives producers to grow potato varieties with higher susceptibility to issues such as blight, PCN and common scab. There is also significant diversity amongst varieties in characteristics such as time of maturity and tuber numbers. For seed production, size fractions and tuber numbers are a more important metric than gross yield.

Potatoes - Pre-Pack Salads

PHYSICAL DATA

(a) Seed

Nominal planting rate of 5 t/ha. Bought in seed. Variety e.g. Charlotte etc. Cost varies with variety and seed size.

(b) Fertiliser

90 : 170 : 110 kg/ha N : P₂O₅ : K₂O (72 : 136 : 88 units/acre). See page 4 for more information on nutrient planning.

(c) Sprays

Seed treatment Seed treatment for Rhizoctonia. Assumption of 50% of the area treated with an in furrow fungicide for Blackdot control.

Herbicides Contact plus reduced rate residual herbicides applied pre-emergence.

Nematicide Assumption of 20% of area treated with reduced rate nematicide for free living nematode control.

Blight control 8-9 spray program including protectant, systemic, curative and tuber blight control chemicals. Cost may be higher in high blight pressure years.

Slug control 2 applications of slug pellets.

Desiccation Pulverizing followed by reduced rate chemical desiccation. For pulverising costs, see page 381.

(d) Other crop expenses

An average period of 6 months cold storage is included.

(e) Irrigation

Irrigation may be applied in some circumstances for yield and quality. These costs are not included. Annual capital charge could be £350-500/ha plus £1.60-1.90/ha.mm with a contract charge of approximately £5.40/ha.mm.

(f) Casual labour

These costs are not included. Costs calculated using the data below could be used. Labour charged at £15/hr (assumes lifting and grading done at the same time) at the rates below:

Operation	hr/ha
Lifting (by harvester)	20
Grading	
low yield	25
medium yield	38

Potatoes - Pre-Pack Salads

GROSS MARGIN DATA

Yield: t/ha (t/acre):		
Ware	37	(15.0)
Stockfeed	4	(1.6)
	<u>41</u>	<u>(16.6)</u>
OUTPUT	£/ha (acre)	
Ware @ £420 /t	15,540	
Stockfeed @ £30 /t	120	
	<u>15,660</u>	<u>(6,338)</u>
VARIABLE COSTS		
Seed @ £350/t	1,750	
Fertiliser	326	
Sprays	794	
Other expenses	1,808	
	<u>4,678</u>	<u>(1,893)</u>
GROSS MARGIN	<u>10,982</u>	<u>(4,444)</u>

WARE PRICE SENSITIVITY

£75 /t	-1,783	-(722)
£150 /t	992	(401)
£200 /t	2,842	(1,150)
£250 /t	4,692	(1,899)
£300 /t	6,542	(2,648)
£375 /t	9,317	(3,771)

Potatoes - Maincrop Ware (Pre-Pack Bakers)

PHYSICAL DATA

(a) Seed

Planted at 2.4 t/ha (can range from 2.0-3.0 t/ha for 35-55 mm seed depending on variety). Bought in. Cost varies with variety, seed size and classification grade.

(b) Fertiliser

200 : 130 : 200 kg/ha N : P₂O₅ : K₂O (160 : 104 : 160 units/acre). See page 4 for more information on nutrient planning.

Reduce N by 33% for indeterminate varieties, e.g. Vales Sovereign.

(c) Sprays

Seed treatment Seed treatment for rhizoctonia control. Assumption 50% of the area treated with in furrow fungicide for control of blackdot.

Nematicide Assumption of 15-20% of area treated for free living nematode or PCN control.

Herbicides Contact plus reduced rate residual herbicide tank mix.

Blight control 12 spray blight program for moderate blight pressure including protectant, systemic, curative and tuber blight protection chemicals.

Slugs control 2-3 applications.

Desiccation 2-3 spray chemical desiccation program.

(d) Other crop expenses

Costs for average cold storage period of 6 months are included.

(e) Irrigation

Irrigation may be applied in some circumstances for yield and quality. These costs are not included. Annual capital charge could be £350-500/ha plus £1.60-1.90/ha.mm with a contract charge of approximately £5.40/ha.mm.

(f) Casual labour

These costs are not included. Costs calculated using the data below could be used. Labour charged at £15/hr at the rates below:

Operation	hr/ha
Lifting (by harvester)	20
Grading (half the grading done by regular labour)	low yield 55 high yield 70

Potatoes - Maincrop Ware (Pre-Pack Bakers)

GROSS MARGIN DATA

Yield: t/ha (t/acre):

Bakers	16	(6.5)	24	(9.7)
Pre-pack	26	(10.5)	31	(12.5)
Outgrades	8	(3.2)	10	(4.0)
	<u>50</u>	<u>(20.2)</u>	<u>65</u>	<u>(26.3)</u>

OUTPUT

£/ha (acre)

Bakers @ £310/t	4,960		7,440	
Pre-pack @ £220/t	5,720		6,820	
Outgrades @ £30/t	240		300	
	<u>10,920</u>	<u>(4,419)</u>	<u>14,560</u>	<u>(5,892)</u>

VARIABLE COSTS

Seed @ £350/t	840		840	
Fertiliser	444		444	
Sprays	730		730	
Other expenses	2,205		2,867	
	<u>4,219</u>	<u>(1,707)</u>	<u>4,881</u>	<u>(1,975)</u>

GROSS MARGIN

	<u>6,701</u>	<u>(2,712)</u>	<u>9,680</u>	<u>(3,917)</u>
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WARE PRICE SENSITIVITY

£50 /t	2,281	(923)	4,410	(1,785)
£130 /t	4,361	(1,765)	6,890	(2,788)
£210 /t	6,441	(2,607)	9,370	(3,792)
£290 /t	8,521	(3,448)	11,850	(4,796)

Note:

Many packers will split grade the pack size (e.g. 45/50-65/70 mm) from the baker (65/70-85 mm), paying a flat rate for all sizes above the 45/50 mm bottom riddle.

Potatoes - Maincrop Ware (Pre-Pack Premium Varieties)

PHYSICAL DATA

(a) Seed

Planted at 1.9 t/ha (varies with variety e.g. Maris Piper, Desiree, King Edward etc). Bought in. Cost varies with variety, seed size and classification grade.

(b) Fertiliser

180 : 130 : 200 kg/ha N : P₂O₅ : K₂O (144 : 104 : 160 units/acre). See page 4 for more information on nutrient planning.

(c) Sprays

Seed treatment Full rate seed treatment for rhizoctonia control. Treated with in furrow fungicide for control of blackdot.

Nematicide Assumption of 15-20% of area treated for free living nematode or PCN control.

Herbicides Contact plus reduced rate residual herbicides applied pre-emergence.

Blight control 12 spray blight program for high blight pressure including protectant, systemic, curative and tuber blight protection chemicals.

Slugs control Comprehensive reduced dose season program.

Desiccation 3 spray chemical desiccation program.

(d) Other crop expenses

Average cold storage period of 6 months and sprout suppression are included.

(e) Irrigation

Irrigation may be applied in many circumstances for yield and quality. These costs are not included. Annual capital charge could be £350-500/ha plus £1.60-1.90/ha.mm with a contract charge of approximately £5.40/ha.mm.

(f) Casual labour

These costs are not included. Costs calculated using the data below could be used. Labour charged at £15/hr at the rates below:

Operation	hr/ha
Lifting (by harvester)	20
Grading (half the grading done by regular labour)	low yield high yield
	55 70

Potatoes - Maincrop Ware (Pre-Pack Premium Varieties)

GROSS MARGIN DATA

Yield: t/ha (t/acre):				
Pre-pack	45	(18.2)	57	(23.1)
Outgrades	5	(2.0)	8	(3.2)
	<u>50</u>	<u>(20.2)</u>	<u>65</u>	<u>(26.3)</u>
OUTPUT		£/ha (acre)		
Pre-pack @ £320/t	14,400		18,240	
Outgrades @ £30/t	150		240	
	<u>14,550</u>	<u>(5,888)</u>	<u>18,480</u>	<u>(7,479)</u>
VARIABLE COSTS				
Seed @ £350/t	665		665	
Fertiliser	425		425	
Sprays	768		768	
Other expenses	2,430		3,159	
	<u>4,288</u>	<u>(1,735)</u>	<u>5,017</u>	<u>(2,030)</u>
GROSS MARGIN	<u>10,262</u>	<u>(4,153)</u>	<u>13,463</u>	<u>(5,449)</u>

WARE PRICE SENSITIVITY

£50 /t	-1,888	-(764)	-1,927	-(780)
£100 /t	362	(146)	923	(374)
£150 /t	2,612	(1,057)	3,773	(1,527)
£200 /t	4,862	(1,968)	6,623	(2,680)
£250 /t	7,112	(2,878)	9,473	(3,834)

Potatoes - Maincrop Ware (Processing - Chips)

PHYSICAL DATA

(a) Seed

Planted at 3.0 t/ha with 35/55mm seed (varies depending on variety, e.g. Maris Piper, Markies, etc). Bought in. Cost varies with variety, seed size and classification grade.

(b) Fertiliser

180 : 130 : 300 kg/ha N : P₂O₅ : K₂O (144 : 104 : 240 units/acre). See page 4 for more information on nutrient planning.

Organic manures may be best avoided for processing crops – late and variable release of N could affect fry quality.

(c) Sprays

Seed treatment None unless rhizoctonia infection present on seed.

Nematicide Assumption of 15-20% of area treated for free living nematode or PCN control.

Herbicides Contact plus reduced rate residual herbicides applied pre-emergence.

Blight control 12 spray blight program for high blight pressure including protectant, systemic, curative and tuber blight protection chemicals.

Slug control Comprehensive reduced dose season program.

Desiccation 3 spray chemical desiccation program.

(d) Other crop expenses

Storage and sprout suppressant costs are included. Chip processing in Scotland is mainly for chip shops, so costs of bags need to be included (£9.00-9.50/t of crop for 25 kg bags).

(e) Casual labour

These costs are not included. Costs calculated using the data below could be used. Labour charged at £15/hr at the rates below:

Operation	hr/ha
Lifting (by harvester)	20
Grading (half the grading done by regular labour)	40

Potatoes - Maincrop Ware (Processing - Chips)

GROSS MARGIN DATA

	Off-field		Ex-store	
Yield: t/ha (t/acre):				
Ware	52	(21.0)	52	(21.0)
Stockfeed	5	(2.0)	5	(2.0)
	<u>57</u>	<u>(23.1)</u>	<u>57</u>	<u>(23.1)</u>
OUTPUT	£/ha (acre)			
Off-field @ £175/t	9,100		-	
Ex-store @ £300/t	-		15,600	
Stockfeed @ £30/t	150		150	
	<u>9,250</u>	<u>(3,743)</u>	<u>15,750</u>	<u>(6,374)</u>
VARIABLE COSTS				
Seed @ £350/t	1,050		1,050	
Fertiliser	485		485	
Sprays	635		635	
Other expenses	-		2,864	
	<u>2,170</u>	<u>(878)</u>	<u>5,034</u>	<u>(2,037)</u>
GROSS MARGIN	<u>7,080</u>	<u>(2,865)</u>	<u>10,716</u>	<u>(4,337)</u>
WARE PRICE SENSITIVITY				
£50 /t	580	(235)	- 2,284	-(924)
£110 /t	3,700	(1,497)	836	(338)
£170 /t	6,820	(2,760)	3,956	(1,601)
£230 /t	9,940	(4,023)	7,076	(2,864)
£300 /t	13,580	(5,496)	10,716	(4,337)

Note:

Prices quoted include typical bonus additions for good dry matter, low tuber count, good size (length), good fry colour and low defect levels.

Potatoes - Maincrop Ware (Processing - Crisps)

PHYSICAL DATA

(a) Seed

Planted at 3.0 t/ha. 35/55mm seed, varies depending on variety, e.g. Hermes, Saturna, Lady Rosetta, Lady Claire, etc. Bought in. Cost varies with variety, seed size and classification grade.

(b) Fertiliser

200 : 130 : 300 kg/ha N : P₂O₅ : K₂O (160 : 104 : 240 units/acre). See page 4 for more information on nutrient planning.

Organic manures may be best avoided for processing crops – late and variable release of N could affect fry quality.

(c) Sprays

Seed treatment None unless rhizoctonia infection present on seed.

Nematicide Assumption of 15-20% of area treated for free living nematode or PCN control.

Herbicides Contact plus reduced rate residual herbicides applied pre-emergence.

Blight control 12 spray blight program for high blight pressure including protectant, systemic, curative and tuber blight protection chemicals.

Slug control 3 applications.

Desiccation 3 spray chemical desiccation program.

(d) Other crop expenses

Processing storage for a 4-month period and sprout suppressant costs are included.

(e) Irrigation

Irrigation may be applied in some circumstances for yield and quality. These costs are not included. Annual capital charge could be £350-500/ha plus £1.60-1.90/ha.mm with a contract charge of approximately £5.40/ha.mm.

(f) Casual labour

These costs are not included. Costs calculated using the data below could be used. Labour charged at £15/hr at the rates below:

Operation	hr/ha	
Lifting (by harvester)	20	
Grading (half the grading done by low yield regular labour)	44	
	high yield	55

Potatoes - Maincrop Ware (Processing - Crisps)

GROSS MARGIN DATA

	Off-field		Ex-store	
Yield: t/ha (t/acre):				
Ware	44	(17.8)	44	(17.8)
Stockfeed	4	(1.6)	4	(1.6)
	<u>48</u>	<u>(19.4)</u>	<u>48</u>	<u>(19.4)</u>
OUTPUT	£/ha (acre)			
Off-field @ £170/t	7,480		-	
Ex-store @ £270/t	-		11,880	
Stockfeed @ £20/t	80		80	
	<u>7,560</u>	<u>(3,059)</u>	<u>11,960</u>	<u>(4,840)</u>
VARIABLE COSTS				
Seed @ £320/t	1,120		1,120	
Fertiliser	504		504	
Sprays	646		646	
Other expenses	-		2,412	
	<u>2,270</u>	<u>(919)</u>	<u>4,682</u>	<u>(1,895)</u>
GROSS MARGIN	<u>5,290</u>	<u>(2,140)</u>	<u>7,278</u>	<u>(2,945)</u>
WARE PRICE SENSITIVITY				
£50 /t	10	(4)	-2,402	-(972)
£110 /t	2,650	(1,072)	238	(96)
£170 /t	5,290	(2,141)	2,878	(1,165)
£230 /t	7,930	(3,209)	5,518	(2,233)
£300 /t	11,010	(4,456)	8,598	(3,480)

Note:

Prices quoted include typical bonus additions for good dry matter, low tuber count, good size (length), good fry colour and low defect levels.

Potatoes - Seed (Low and High Number Varieties)

PHYSICAL DATA

(a) Seed

Planted at 4.8 t/ha (can range from 3.5-6.1 t/ha for 35/55 mm seed depending on variety and top riddle size on which daughter crop will be sold). Half bought in. Cost varies with variety, seed size and classification grade.

(b) Fertiliser

80 : 170 : 110 kg/ha N : P₂O₅ : K₂O (64 : 136 : 88 units/acre). See page 4 for more information on nutrient planning.

Reduce N by 25% for indeterminate varieties, e.g. Cara and Markies.

(c) Sprays

Seed treatment Multipurpose seed treatment applied at grade plus reduced rate fungicide applied for rhizoctonia.

Nematicide Assumption of no treatment applied. Application may be required in field and varieties at risk of spraing.

Herbicides Contact plus reduced rate residual herbicides applied pre-emergence.

Blight control 8-9 spray program with protectant, systemic, curative and tuber blight protection products for moderate-high blight pressure.

Aphid control Up to 8 applications.

Slug control 2 applications.

Desiccation Pulverising followed by chemical desiccation. For pulverising costs, see page 381.

(d) Other crop expenses

SPCS field inspection fees, roguing and labels are included. Positive ventilation and cold storage. Other costs may include bags (£7.50-11.20/t of crop), chemical treatment at storage time and royalties (which will depend on variety).

(e) Casual labour

These costs are not included. Costs calculated using the data below could be used. Labour charged at £15/hr at the rates below:

Operation	hr/ha
Lifting (by harvester)	20
Grading (half the grading done by regular labour)	40

Potatoes - Seed (Low and High Number Varieties)

GROSS MARGIN DATA

	Low		High	
Yield: t/ha (t/acre): seed	25	(10.1)	35	(14.2)
Yield: t/ha (t/acre): ware	6	(2.4)	6	(2.4)
Yield: t/ha (t/acre): s/feed	2	(0.8)	2	(0.8)
	<u>33</u>	(13.4)	<u>43</u>	(17.4)
OUTPUT	£/ha (acre)			
Seed @ £360/t	9,000		-	
Ware @ £200/t	1,200		-	
Stockfeed @ £30/t	60		-	
Seed @ £360/t	-		12,600	
Ware @ £200/t	-		1,200	
Stockfeed @ £30/t	-		60	
	<u>10,260</u>	(4,152)	<u>13,860</u>	(5,609)
VARIABLE COSTS				
Seed @ £390/t	1,872		1,658	
Fertiliser	316		316	
Sprays	820		805	
Other expenses	2,602		3,362	
	<u>5,610</u>	(2,270)	<u>6,141</u>	(2,485)
GROSS MARGIN	<u>4,650</u>	(1,882)	<u>7,719</u>	(3,124)
SEED PRICE SENSITIVITY				
£150 /t	-600	-(243)	369	(149)
£250 /t	1,900	(769)	3,869	(1,566)
£300 /t	3,150	(1,275)	5,619	(2,274)

Potatoes - Dual Purpose (Seed and Ware)

PHYSICAL DATA

(a) Seed

Planted at 3.8 t/ha (can range from 3.5-5 t/ha for 35x55 mm seed depending on variety. Half bought in. Cost varies with variety, seed size and classification grade.

(b) Fertiliser

150 : 150 : 200 kg/ha N : P₂O₅ : K₂O (120 : 120 : 160 units/acre). See page 4 for more information on nutrient planning.

(c) Sprays

Seed treatment Multipurpose seed treatment applied at grade plus reduced rate fungicide applied for rhizoctonia. Fungicide incorporated into soil on 50% area for powdery scab control.

Nematicide Assumption of no treatment applied. Application may be required in field and varieties at risk of spraing.

Herbicides Contact plus reduced rate residual herbicides applied pre-emergence.

Blight control 8-9 spray program with protectant, systemic, curative and tuber blight protection products for moderate blight pressure.

Aphid control Up to 8 applications.

Slug control 2-3 applications.

Desiccation Pulverising followed by chemical desiccation. For pulverising costs, see page 381.

(d) Other crop expenses

SPCS field inspection fees; roguing and labels and positive ventilation and cold storage are included. Other costs include bags (£7.50-£11.20/t of crop), chemical treatment at storage time and royalties, depending on variety.

(e) Irrigation

Irrigation may be applied in some circumstances for yield and quality. These costs are not included. Annual capital charge could be £350-500/ha plus £1.60-1.90/ha.mm with a contract charge of approximately £5.40/ha.mm.

(f) Casual labour

These costs are not included. Labour charged at £15/hr as per labour rates on page 60 for low yields.

Potatoes - Dual Purpose (Seed and Ware)

GROSS MARGIN DATA

Yield: t/ha (t/acre): seed	22	(8.9)
Yield: t/ha (t/acre): ware	19	(7.7)
Yield: t/ha (t/acre): s/feed	4	(1.6)
	<u>45</u>	<u>(18.2)</u>
OUTPUT	£/ha (acre)	
Seed @ £300/t	6,600	
Ware @ £250/t	4,750	
Stockfeed @ £30/t	120	
	<u>11,470</u>	<u>(4,642)</u>
VARIABLE COSTS		
Seed @ £300/t	1,140	
Fertiliser	417	
Sprays	741	
Other expenses	3,469	
	<u>5,767</u>	<u>(2,334)</u>
GROSS MARGIN	<u>5,703</u>	<u>(2,308)</u>

WARE PRICE SENSITIVITY

£50 /t	1,903	(770)
£110 /t	3,043	(1,231)
£170 /t	4,183	(1,693)
£230 /t	5,323	(2,154)

Grassland

Introduction

With increasing weather extremes, grassland is getting more challenging to manage. This puts a greater onus on managing grass flexibly and being prepared to reduce pressure on grass if required by reducing stocking or through feeding. The 2024 grass growing season was slow to start with a burst of grass in May when weather conditions were favourable and dropped again in June due to unseasonably cold conditions.

To optimise grassland productivity and quality, consider the following management strategies:

- **Soil Health:** Regular soil testing and appropriate nutrient management are crucial. Monitor pH, phosphorus and potassium levels as a minimum to prevent deficiencies.
- **Reseeding:** Fields with poor growth and less than 60% of desired species should be reseeded with high-yielding varieties.
- **Grazing Management:** Implement rotational grazing systems to maximise grass utilisation and maintain sward quality. Avoid overgrazing, particularly during drought or excessive rain periods.
- **Fertilisation:** Apply nitrogen fertilisers if required when other factors such as drought or cold soils are not limiting grass production. Use organic manures for additional nutrient supply.
- **Weed Control:** Maintain vigilance with weed control measures. Persistent weeds like docks and thistles can be managed through a combination of chemical and mechanical methods.

Grass yield can range from 1t dry matter (DM)/ha on hill ground to 20t DM/ha on good dairy land. The average grass yield is around 6t DM/ha on Scottish upland/lowland grazing livestock farms.

Environmental Considerations

Biodiversity: Enhance biodiversity by maintaining field margins, incorporating diverse grass species and increasing pasture rest.

Water Management: Efficient water use and drainage systems are essential to prevent waterlogging and soil erosion.

Carbon Sequestration: Grasslands are a vital soil carbon store. Conserving this store is important for climate change mitigation.

Potential dry matter yields (kgDM/ha) at different N levels/ha

kg N/ha	Yield (kgDM/ha)	Cow grazing days /ha	Stocking density (LU/ha)
0	3,000	240	0.46
75	4,200	335	0.64
125	5,500	439	0.84
175	7,000	559	1.07
250	8,000	639	1.23
310	10,000	799	1.53

The values in the table above assume a low clover content. Use the table below to account for clover contribution.

Accounting for clover: Clover Content (%DM)	Potential Nitrogen supply (kg N/ha)
20-30%	180
40%	240
50-60%	300

Analysis of grazed leafy grass often ranges from 15-25% DM, 10-12.5 megajoules of metabolizable energy (MJ ME)/kg DM and 12-26% crude protein – it is often as nutritious as concentrate feed. The cost per kg DM depends on the yield.

The variable cost data tables for grass, silage and hay provide the basis of the forage costs for the livestock enterprise gross margin figures.

Grazing systems defined

The following table illustrates the main grazing methods practised in Scotland.

	Grazing Interval	Rest Period*	Grass Height Targets		Grass Utilisation
			Entry	Exit	
Set stocking	over 1 week	NA	5-8cm		50%
Paddock grazing	0.5 days-1 week	15-30 days	8-10cm	5cm	65-80%
Mob grazing	0.5 days-3 days	40 days+	30cm+	10-20cm	30-50%

* Guide during the growing season, this should be flexible according to the growing conditions.

More information on mob grazing and rotational grazing is available in the following FAS New Entrants Factsheets:

- Mob Grazing with Beef Cattle:
<https://www.fas.scot/publication/mob-grazing-with-beef-cattle/>
- Rotational Grazing:
<https://www.fas.scot/downloads/rotational-grazing/>

Stocking rate

Stocking rate is expressed as grazing livestock units (see page 112 – Livestock section), GLU per effective (adjusted) hectare where:

- 2.5 GLU/ha (1 per acre) is very intensive (very high N input)
- 2.0 GLU/ha is intensive (high N input)
- 1.5 GLU/ha is semi-intensive (moderate N input or high clover %)
- 1.0 GLU/ha is extensive (low N input/clover based)
- 0.5 GLU/ha is very extensive (very low/no N inputs)

Choice of seed mixtures

The seed mixture should be chosen using recommended varieties tested in Scotland by SRUC, England & Wales by NIAB-TAG or Northern Ireland by DAERA. Grass swards will contain mainly perennial ryegrass, white clover, and timothy. Varieties chosen should be compatible and chosen according to the farm system, the use of the ley (silage, hay, dual purpose), special requirements such as disease resistance and winter hardiness.

Inclusion of herbs such as Plantain and Chicory have proven benefits to animal performance, but these plants may not persist for long. Rotational grazing is recommended to make the most of these herbs. Red clover is another great addition to the mix due to its high N fixation (over 300 kg N/ha is possible) and nutritional quality.

Sward Improvement

Options for sward improvement range from full ploughing (reseeding/replacement) to oversowing (renovation). The approximate costs of different improvement methods are outlined in the table overleaf. These include variable costs as well as the cultivation costs.

Assumptions:

- A long-term seed mixture at full rate, 37kg/ha, for ploughing and direct drilling, and half rate, 18kg/ha, for oversowing.
- Fertiliser inputs are based on moderate P and K soil status. No fertiliser assumed for the over sow. pH is assumed to be ideal thus no cost for lime is included.
- Chemical costs for the destruction of the old sward prior to cultivation have been assumed for ploughing and direct drilling options. Other pesticides may be required for specific circumstances.
- Cultivation methods are assumed to be carried out by contractors. Contractor costs can be found on pages 379-382.
- Machinery fuel use (l/ha) and fuel cost on page 376-377.

	Plough	Direct drill	Over sow
Reliability	High	Mod/High	Moderate
Speed of improvement	Moderate	Moderate	Rapid
Loss of grass production	High	High	Low
	£/ha (acre)		
Variable costs			
<i>Seed</i>	215	215	104
<i>Fertiliser</i>	129	129	-
<i>Sprays</i>	14	14	-
	358 (145)	358 (145)	104 (42)
Cultivation costs			
<i>Spray</i>	15	15	-
<i>Plough</i>	73	-	-
<i>Power harrow/subsoil</i>	65	-	-
<i>Harrow</i>	-	-	34
<i>Roll and destone</i>	21	-	-
<i>Sow</i>	37	65	37
<i>Roll</i>	28	28	28
<i>Fertilise</i>	12	12	-
<i>Fuel cost</i>	55	18	12
	307 (124)	138 (56)	111 (45)
Total costs	665 (269)	496 (201)	216 (87)
<i>No. of years per cultivation</i>	7	7	7
Total cost per annum	95 (38)	71 (29)	31 (12)

Preserved Grass Production Costs

The table on the following page shows the cost of producing preserved grass as silage or hay.

Assumptions:

- Yield and N fertiliser are outlined on pages 76 and 78.
- Establishment costs based on figures on pages 70-71.
- Annual variable costs are based on variable cost data (less annual share of seed) shown on pages 77 and 79.
- Annual production costs are assumed to be carried out by contractors. Contractor costs can be found on pages 379-382.
- Machinery fuel use (l/ha) and fuel cost on page 376-377.
- Other crop expenses for ensiled silage are based on using plastic sheets. For baled silage, this includes net wrap and plastic wrap as described on page 77. For hay, the cost for net wrap is included in the annual variable costs.
- Land rent and maintenance or a finance charge associated with a silage clamp have not been included in the calculations.
- Yield potential will vary and no account has been taken for wastage in the preserved state and at feeding.

Cost of producing preserved grass as silage or hay

	Silage 1 cut ensiled	Silage 1 cut bales	Hay 1 cut bales
N fertiliser use (kgN/ha)	125	125	125
Yield (t FW/ha)	20	20	6
Yield (t DM/ha)	6	6	5
Bale weight (round 4' x 4' - kg)	-	650	250
		£/ha	
Establishment costs (annual share)	95	95	95
Annual variable costs	184	184	257
Annual production costs			
<i>Spray</i>	15	15	15
<i>Fertiliser</i>	12	12	12
<i>Mow</i>	33	33	33
<i>Rake</i>	19	-	41
<i>Lift, cart and clamp crop</i>	143	-	-
<i>Bale, wrap and stack</i>	-	299	70
<i>Other crop expenses</i>	3	108	-
<i>Fuel</i>	42	19	25
	<u>267</u>	<u>486</u>	<u>196</u>
Total cost per annum (£/ha)	<u>546</u>	<u>765</u>	<u>548</u>
Cost per t FW (£/t)	27	38	91
Cost per t DM (£/t)	91	127	107
Cost per bale (£/bale)	-	25	23

Grassland - Grazing

PHYSICAL DATA

(a) System

Assume a 7-year sward life.

Establishment costs are described on pages 70-71.

(b) Yield

See pages 70-72 for the dry matter yield and stocking rate (LU/ha) assumptions for varying Nitrogen application rates.

(c) Seed

A nominal annual charge (assume a 7-year sward life, for longer leys reduce the annual charge accordingly):

Mixture	£/ha
One year	98-185
Two-three years	117-224
Four-six years	159-223
Permanent	175-237

(d) Fertiliser

See page 4 for more info on nutrient planning.

kg/ha (units/acre)/annum										
N	0	(0)	75	(60)	125	(100)	175	(140)	250	(200)
P ₂ O ₅	0	(0)	10	(8)	15	(12)	20	(16)	30	(24)
K ₂ O	0	(0)	15	(12)	15	(12)	20	(16)	30	(24)

(e) Sprays

A nominal annual charge (assume a 7-year sward life, for longer leys reduce the annual charge accordingly) to cover a herbicide during establishment, followed by a herbicide to control a broader range of perennial weeds, such as docks, thistles, and nettles.

Grassland - Grazing

VARIABLE COST DATA

Fertiliser kg N/yr	0	(0)	75	(60)	125	(100)	175	(140)	250	(200)
VARIABLE COSTS *	£/ha (acre)									
Seeds	23		23		23		23		23	
Fertiliser	0		91		144		200		288	
Sprays	10		10		10		10		10	
Other expenses	-		-		-		-		-	
	<u>33</u>	(13)	<u>124</u>	(50)	<u>177</u>	(72)	<u>233</u>	(94)	<u>321</u>	(130)

FERTILISER PRICE SENSITIVITY (+/-)

10 p/kg N	0	(0)	8	(3)	13	(5)	18	(7)	25	(10)
10 p/kg P ₂ O ₅	0	(0)	1	(0)	2	(1)	2	(1)	3	(1)
10 p/kg K ₂ O	0	(0)	2	(1)	2	(1)	2	(1)	3	(1)

* The cost per tonne of dry matter grown depends on yield and should also include a share of reseed costs (contractor/machinery upkeep/fuel). Cost will also depend on the response to nitrogen (see page 68), and grazing utilisation.

Grassland - Silage and Aftermath Grazing

PHYSICAL DATA

(a) System

Assume a 7-year sward life.

Establishment and harvest costs are described on pages 70-71 and 73.

(b) Yield

Settled silage (kg fresh weight) at 25%DM.

Fertiliser N kg/ha (units/acre)/annum	70	(56)	130	(104)	250	(200)	310	(248)
Silage t/ha (t/acre)								
1st cut	20	(8.1)	20	(8.1)	25	(10.1)	20	(8.1)
2nd cut	-	-	10	(4.0)	15	(6.1)	16	(6.5)
3rd cut	-	-	-	-	-	-	16	(6.5)
Total	20	(8.1)	30	(12.1)	40	(16.2)	52	(21.0)

Apportionment - the following yield ratios are suggested:

Silage	50	80	80	95
Aftermath	50	20	20	5

(c) Seed

A nominal annual charge (assume a 7-year sward life, for longer leys reduce the annual charge accordingly):

Mixture	£/ha
One year	98-185
Two-three years	117-224
Four-six years	159-223
Permanent	175-237

(d) Fertiliser

Neither P₂O₅ nor K₂O is assumed for aftermaths, although their use would be recommended subject to nutrient management planning. See page 4 for more info on nutrient planning.

Silage cuts	kg/ha (units/acre)/annum							
	One		Two		Two		Three	
For silage								
N	70	(56)	100	(80)	220	(176)	310	(248)
P ₂ O ₅	34	(27)	51	(41)	68	(54)	88	(70)
K ₂ O	120	(96)	180	(144)	240	(192)	312	(250)
For aftermath								
N	0	(0)	30	(24)	30	(24)	-	-

Grassland - Hay and Aftermath Grazing

PHYSICAL DATA

(a) System

Assume a 7-year sward life.

Establishment and harvest costs are described on pages 70-71 and 73.

(b) Yield

Fertiliser N kg/ha units/acre)/annum	80 (64)	140 (112)	180 (144)
Hay t/ha (t/acre)	5 (2.0)	6 (2.4)	7 (2.8)
Aftermath (cow grazing days)	125	140	180

Apportionment - a yield ratio of 75 : 25, hay : aftermath should be used.

To prevent heating in store, aim to bale hay at 15-20% moisture and leave to stand in field until heating ceases.

(c) Seed

A nominal annual charge (assume a 7-year sward life, for longer leys reduce the annual charge accordingly):

Mixture	£/ha
One year	98-185
Two-three years	117-224
Four-six years	159-223
Permanent	175-237

(d) Fertiliser

Neither P₂O₅ nor K₂O is assumed for aftermaths, although their use would be recommended subject to nutrient management planning. See page 4 for more info on nutrient planning.

		kg/ha (units/acre)/annum					
For hay	N	80	(64)	80	(64)	80	(64)
	P ₂ O ₅	30	(24)	35	(28)	42	(34)
	K ₂ O	90	(72)	108	(86)	126	(101)
For aftermath	N	-	-	60	(48)	100	(80)

(e) Sprays

A nominal annual charge (assume a 7-year sward life, for longer leys reduce the annual charge accordingly) to cover a herbicide during establishment, followed by a herbicide to control a broader range of perennial weeds, such as docks, thistles and nettles.

(f) Other crop expenses

Net wrap cost is costed at 50p/bale, based on 4 round bales/t and assuming one roll of net will wrap 410 bales.

Grassland - Hay and Aftermath Grazing

VARIABLE COST DATA

Fertiliser kg N/ha (units/acre)/annum	80	(64)	140	(112)	180	(144)
VARIABLE COSTS			£/ha (acre)			
Seeds	23		23		23	
Fertiliser	161		235		291	
Sprays	10		10		10	
Other expenses	10		12		14	
	<u>204</u>	(83)	<u>280</u>	(113)	<u>338</u>	(137)

FERTILISER PRICE SENSITIVITY (+/-)

10 p/kg N	8	(3)	14	(6)	18	(7)
10 p/kg P ₂ O ₅	3	(1)	3	(1)	4	(2)
10 p/kg K ₂ O	9	(4)	10	(4)	12	(5)

Forage Crops

Introduction

Home-grown forage crops offer high yielding alternatives to grass, but establishment cost, crop failure risk and time out of pasture production must be considered. Yield, quality, and utilisation are key to cost-effective forage crop production. Increasing the amount of grazed forage in the diet reduces reliance on expensive purchased feed and aids with filling the forage gap in the winter months.

Forage crops can be useful in both arable and grazing rotations; they make a good break crop between grass-to-grass re-seeds and provide time to correct deficiencies in pH, P and K, soil compaction and weed control. They can also be used as a pioneer crop in uncultivated areas.

Crops can be either full-season crops or quick growing catch crops. To ensure high yields and to justify the cost of production and length of time taken out of production a full-season crop should be grown on good land with correct agronomy. A catch crop can be grown after silage, wholecrop cereal or early harvested cereals to give a bonus crop of forage and allow an early re-seed the following spring. Catch crops can be very cost-effective and aid in filling the forage gap when grass growth slows in the late Autumn/early winter.

Wholecrop silage

Wholecrop silage can provide a high-starch, high-fibre feed, replacing some, or all, of the grass silage in the ration. As it is high-yielding, production costs per kilogram of dry matter (DM) are competitive with other forages. Although the crude protein can be lower, unless using a legume or a cereal-legume mix. The earlier harvest reduces risk of bad weather at harvest time and provides time for winter cropping.

Brassicas and root crops

Brassica and beet crops such as kale, forage rape, rape/kale hybrids, fodder beet, grazing turnips, swedes and stubble turnips provide nutritious, cost-effective feeds. Out-wintering on brassicas and beet crops can extend the grazing season and allow for more animals to be kept, with minimal extra infrastructure investment. However, a contingency plan must be in place for when ground conditions/weather make grazing challenging.

Leafy forage crops are generally high in protein while roots/bulbs are higher in energy. Fodder beet is the highest yielding energy crop for livestock, allowing high stocking densities – some farmers will manage over 100 ewes per hectare for around two and a half months (Jan- Mar).

Forage brassica and root crops should comprise up to 70% of the total DM intake of livestock. A grass runback and drier lying area with fresh water should always be provided. Livestock should be transitioned slowly and carefully onto forage crops to allow for rumen adaption. In addition, another source of forage should be supplied such as straw for dry cows

and silage for more productive stock. For lamb finishing, concentrates can help balance the diet. Correct mineral/trace element supplementation is important when feeding forage crops.

The use of an electric fence is advisable to encourage stock to eat the whole crop evenly for high utilisation and to ensure the ration has an adequate mix of energy and protein.

It is important to assess the yield of the crop by cutting and weighing several 1m² sections and then accurately calculating the area the group of stock require each day. To assess the yield, make a frame that is 1m² and cut several representative samples of the crop. Place the sample in a bag and weigh using a scale. Multiply the average of your samples by 10,000 to give a fresh weight per hectare then again by the DM% (from the following tables - overleaf) to give DM yield/ha. The crop can then be rationed to the stock based on their nutritional requirements, taking into account the likely utilisation (%) and any other forages provided.

The yield for fodder beet is assessed differently and will depend on the width of the rows. If the rows are 45cm apart, then measure 5.5 metres along a drill, if they are 50cm apart, then measure 5 metres along a drill. Lift the whole plant (bulb and leaf) from both sides of the area measured, lifting 2 rows of beet at either 5m or 5.5 metres length (depending on row width). Weigh the leaf and the bulb separately. Repeat this over 5 different sample areas, to sample 25m² in total. Calculate the total fresh weight of the bulb and leaf over the 5 sites. Multiply this by 400 and divide by 1,000 to get the tonnes of fresh weight per hectare. Then multiply this figure by the dry matter (bulb ~15%, leaf ~10%) to calculate the tonnes of dry matter/ha. Dry matter analysis is recommended to understand the actual values for the crop.

Forage Crop Technical Data

The following tables provide technical data that can be used in conjunction with the variable cost data for all the crops illustrated later in the section.

Variable costs include seed, chemical and fertiliser as per variable cost data for each crop. Costs of establishment are not included and will vary enormously depending on previous cropping, nutrients in the soil, whether it is a full season or catch crop and past experience of the various methods of establishment. Machinery costs on pages 379-382 can be referred to for typical ploughing, cultivation and drilling costs.

	Kale	Forage rape	Kale/rape hybrid	Forage Rye
Sown	May- Jul	Apr- Aug	Apr-Aug	Aug-Oct
Utilised	July-Mar	Aug- Dec	Jun-Jan	Mar-Nov
Variable cost (£/ha)	554	328-456	318-554	393
Grazings	1	1	1-2	Several
DM (%)	14-16	10-14	12-13	20
ME (MJ/kgDM)	10.5	9.5	10.5	10
CP (%)	16-17	19-20	19-20	11
% utilisation	80	80	80	70
Av DM yield (t/ha)	7.5	4.5	6	5.5
Cow graze days/ha ¹	1,260	684	1,008	1,680
ha/50 cows/100days ¹	4.0	7.3	5.0	3.0
Lamb graze days/ha ²	6,000	3,600	4,800	3,850
ha/250 lambs/100days ²	4.2	6.9	5.2	6.5

	Swede	Turnips	Stubble turnips	Fodder beet
Sown	Mar-May	Apr- Jun	May-Sept	Mar-May
Utilised	Oct-Apr	Sep-Apr	Aug-Dec	Oct-May
Variable cost (£/ha)	275	309	511	865
Grazings	1 or lifted	1	1	1
DM (%)	10-13	9-10	8-9	13-16
ME (MJ/kgDM)	13	13	11	13
CP (%)	10-11	10-12	17-18	6-8
% utilisation	80	80	80	80
Av DM yield (t/ha)	8	5	4	15
Cow graze days/ha ¹	1,664	1,040	704	-
ha/50 cows/100days ¹	2.6	4.6	7.9	-
Lamb graze days/ha ²	6,400	4,000	3,200	12,000
ha/250 lambs/100days ²	3.9	6.3	7.8	2.1

¹ Cows getting 50MJ/day from crop and the rest from other forage.

² Lambs allowed 1kg DM/day of crop.

The nutritional qualities shown above represent an average; crops vary, and it is advised to analyse high value crops for dry matter (DM), Metabolisable Energy (ME) and protein (CP) to ensure appropriate allocations are being made.

Dry cow wintering example - A herd of dry suckler cows require 75MJ/hd/day ME. On a diet of kale and straw, 50MJ is expected to come from kale. At 7.5tDM/ha, 10.5ME and 80% utilisation each m² of kale will

contain 6.3 MJ. Therefore, the herd of 50 cows require 397m² of kale per day.

Ewe grazing example - 100 ewes are given an allowance of 1kg DM of forage rape per head/day. With a yield of 4.5tDM/ha and utilisation of 80%, the group will require 278m²/day or approximately 0.19ha (0.5 acres) per week.

Preserved Forage Crop Technical Data and Production Costs

The following table shows the cost of preserving forage crops including arable silage, forage maize and wholecrop wheat.

Assumptions:

- All crops ensiled.
- Yield potential will vary depending on site, timing, weather conditions and wastage at feeding.
- For breakdown, see variable cost data for each individual crop.
- Establishment and production costs based on contractor charges on pages 379-382, and fuel use (l/ha) and fuel cost on page 376-377.
- Total cost per annum does not include land rent and maintenance or finance charge associated with a silage clamp. The true cost will be higher due to wastage.

	Arable silage pea/ cereal mix ensiled	Forage maize under plastic ensiled	Wholecrop ferm'd winter wheat ensiled	crack'd winter wheat ensiled
Yield (t FW/ha)	30	40	25	15
Yield (t DM/ha)	8	15	10	12
ME (MJ/kgDM)	10	10.5	10.5	10.5
CP (%)	16	9	9.5	9.5
	£/ha			
Variable costs	374	718	495	679
Establishment costs				
<i>Plough</i>	73	73	73	73
<i>Sow</i>	75	163	75	75
<i>Roll and de-stone</i>	21	21	21	21
<i>Fuel</i>	50	50	50	50
	219	307	219	219
Production costs				
<i>Spray</i>	15	15	46	46
<i>Fertilise/Slurry/FYM</i>	12	18	37	37
<i>Lift, cart and clamp crop</i>	194	206	194	194
<i>Other crop expenses</i>	3	3	3	3
<i>Fuel</i>	19	43	23	23
	245	285	304	304
Total cost per annum (£/ha)	837	1,310	1,017	1,201
Cost per t FW (£/t)	28	33	41	80
Cost per t DM (£/t)	105	87	102	100

Forage Peas and Pea/Cereal Mixtures (Arable Silage)

PHYSICAL DATA

(a) System

Forage peas (sown Mar-Jun) are grown as a catch crop to be grazed *in situ*, zero-grazed or ensiled/baled (harvested at flowering when pods have formed but not yet filled and wilted for 1-2 days). Peas can be grown alone, or in mixtures with barley or oats and undersown with grass for arable silage. Peas are highly palatable to livestock so must be introduced gradually and monitored to prevent bloat. Total production costs including establishment and harvest are described on page 86.

(b) Yield (in 12-16 weeks)

	Fresh t/ha (t/acre)	Dry matter t/ha (t/acre)
Forage peas	20-30 (8-12)	6-8 (2.4-3.2)
Arable silage	20-35 (8-14)	6-10 (2.4-4.0)

(c) Seed rates (kg/ha)

Forage peas:		Arable silage undersown with grass:	
direct drill	125	peas	40-60
(broadcast	150)	cereal	60-80
		total	100-140

Seed mixtures cost (p/kg):

Cereal	38.3
Peas	57

(d) Fertiliser – kg/ha (units/acre)

	Forage peas		Undersown arable silage			
			at sowing		after harvest	
N	0	(0)	40-60	(32-48)	50	(40)
P ₂ O ₅	50	(40)	90	(72)	25	(20)
K ₂ O	50	(40)	90	(72)	25	(20)

Apportionment of the cost of fertiliser in the seed bed and the residual value of nitrogen to the subsequent crop may be justified. See page 4 for more information on nutrient planning.

(e) Sprays

Pre emergence herbicide for forage peas can be used. There are no broad-spectrum post emergence herbicides available for this crop. Varietal tolerance to a proposed spray should be ascertained.

A silage additive (£1.00-£1.60 per tonne silage – depending on the product chosen and its rate of application) is recommended for silages with a high pea content.

Forage Peas and Pea/Cereal Mixtures (Arable Silage)

VARIABLE COST DATA

	Forage Peas		Arable silage undersown	
VARIABLE COSTS			£/ha (acre)	
Seed	104		80	
Fertiliser	81		294	
Sprays	-		-	
Other expenses	-		-	
	<u>185</u>	(75)	<u>374</u>	(151)

FERTILISER PRICE SENSITIVITY (+/-)

10 p/kg N	0	(0)	10	(4)
10 p/kg P ₂ O ₅	5	(2)	12	(5)
10 p/kg K ₂ O	5	(2)	14	(6)

Forage Maize

PHYSICAL DATA

(a) System

Forage maize is ensiled and the clamp should be monitored for overheating. Introduce gradually into the animal's diet, ensuring there is an adequate source of long fibre in the ration and protein supplementation is essential. Contractor costs for establishment and harvest are described on page 86.

(b) Yield

	Without plastic	With plastic
Fresh (t/ha)	40	50
DM (t DM/ha)	12	15

(c) Seed

Target established plant density 100,000 plants/ha; sow at 15% above target plant density. Do not sow too early (soil temperature 8-10°C, 10 cm depth for 7 days).

(d) Fertiliser

	kg/ha	(units/acre)
N	120	(96)
P ₂ O ₅	60	(48)
K ₂ O	165	(132)

(e) Sprays

Pre-emergence herbicide, then later before 8 leaf stage (without plastic).

In some years, slugs can be a problem.

Maize silage generally ferments effectively on its own, and additives are not usually necessary. However, using additives can help minimise aerobic spoilage, especially in situations where the silage clamp is large, and the maize is removed slowly

Forage Maize

VARIABLE COST DATA

	Without plastic		With plastic	
VARIABLE COSTS			£/ha (acre)	
Seed	212		212	
Fertiliser	275		-	
Sprays etc.	91		91	
Other expenses	-		415	
	<u>578</u>	(234)	<u>718</u>	(290)

FERTILISER PRICE SENSITIVITY (+/-)

10 p/kg N	12	(5)	-
10 p/kg P ₂ O ₅	6	(2)	-
10 p/kg K ₂ O	17	(7)	-

Whole Crop Cereal - Winter Wheat

PHYSICAL DATA

(a) System

Whole cropping of wheat provides an alternative feed to silage providing a good source of starch and fibre. The crop can be harvested at various growth stages creating different products. Additives can be used to improve preservation and feed quality. For example, grain moisture >45% (soft dough, soft cheese) fermented whole crop, grain moisture 30% (hard cheese) crimped grain or urea treated whole crop and <30% treated and processed whole crop. See page 20 for more detail on growing winter wheat.

(b) Yield

	Fermented whole crop	Cracked whole crop
Fresh (t/ha)	29	14
DM (t DM/ha)	10	12

(c) Seed

Certified seed second generation (C2) sown at the rate of 220 kg/ha.

(d) Fertiliser

See page 4 for more information on nutrient planning.

	kg/ha	(units/acre)
N	200	(160)
P ₂ O ₅	67	(54)
K ₂ O	83	(66)

(e) Sprays

Herbicides Autumn residual herbicide to control annual meadow grass and broad leaved weeds.

Fungicides Two applications at GS31-32 and GS39 for eyespot, leaf diseases (e.g. septoria).

For sprays against other hazards see page 20.

(f) Other crop expenses

Fermented whole crop wheat can be made successfully without an additive, but the use of additives can improve aerobic stability. Additive costs range from £1.00-£1.60 per tonne - depending on the product chosen and its rate of application. Refer to page 86 for other crop expenses such as plastic covers.

Whole Crop Cereal - Winter Wheat

VARIABLE COST DATA

	Fermented whole crop		Cracked whole crop	
VARIABLE COSTS		£/ha (acre)		
Seed @ £455/t	100		100	
Fertiliser	310		310	
Sprays etc.	85		85	
Other expenses	-		184	
	<u>495</u>	(200)	<u>679</u>	(275)

FERTILISER PRICE SENSITIVITY (+/-)

10 p/kg N	20	(8)	20	(8)
10 p/kg P ₂ O ₅	7	(3)	7	(3)
10 p/kg K ₂ O	8	(3)	8	(3)

Forage Rye

PHYSICAL DATA

(a) System

A catch crop of winter rye sown after early harvested cereal (Sep/Oct) and followed by light grazing at the end of the calendar year and subsequent cropping.

(b) Yield

Can be variable but, given early sowing, dry matter yields of up to 0.75t DM/ha in autumn and 2.25t DM/ha in spring can be achieved. Total dry matter yields up to 5.5t DM/ha can be achieved.

Forage rye can provide early spring grazing for 15-20 cows or 50-60 sheep per hectare over a three-week period.

(c) Seed

Rate – 185 kg/ha.

Early sowing is important. Rye seed for grazing is large and should be sown at a depth of 2-3 cm. After sowing, the soil should be rolled to enhance contact between the soil and the seed.

(d) Fertiliser

See page 4 for more information on nutrient planning.

	kg/ha (units/acre)				Total	
	Seed bed		Early spring			
N	-	-	80	(64)	80	(64)
P ₂ O ₅	30	(24)	-	-	30	(24)
K ₂ O	30	(24)	-	-	30	(24)

Forage Rye

VARIABLE COST DATA

VARIABLE COSTS	£/ha (acre)	
Seed	141	
Fertiliser	125	
Sprays etc.	-	
Other expenses	-	
	<hr/>	
	266	(107)
	<hr/>	

FERTILISER PRICE SENSITIVITY (+/-)

10 p/kg N	8	(3)
10 p/kg P ₂ O ₅	3	(1)
10 p/kg K ₂ O	3	(1)

Kale

PHYSICAL DATA

(a) System

Strip grazing behind an electric fence is recommended for optimal utilisation. Often grazed with cattle but can be grazed by sheep. Allow at least 3m of space per cow and a runback including hay/straw, minerals (unless bolussed) and water. Kale can be fed as part of a catch crop mixture with stubble turnips and forage rape.

The advantages of kale include winter hardiness and a prolonged utilisation period of the crop. Early and late-maturing varieties are available. Watch out for flea beetle, a problem for Kale due to its slow early establishment.

(b) Yield

	Fresh		DM t/ha (t/acre)	
Autumn kale	70	(28.3)	8	(3.2)
Winter kale	50	(20.2)	7	(2.8)

(c) Seed

Rate – 5.0 kg/ha.

Seed treated with neonicotinoid which is still approved for animal feed, game and seed.

(d) Fertiliser

	kg/ha	(units/acre)
N	160	(128)
P ₂ O ₅	50	(40)
K ₂ O	170	(136)

Fertiliser rates will vary greatly with circumstances. Assume following grass, greater N requirements if following harvested crops. Some farmers may also choose to top dress some of the N. See page 4 for more information on nutrient planning.

(e) Sprays

Herbicides Stale seed bed and a pre-emergence herbicide.

Slugs Slug pellets may be broadcast or drilled with the seed.

Flea Beetle Insecticide may be required.

Kale

VARIABLE COST DATA

VARIABLE COSTS	£/ha (acre)
Seed	84
Fertiliser	182
Sprays etc.	29
Other expenses	-
	<hr/>
	295 (119)

FERTILISER PRICE SENSITIVITY (+/-)

10 p/kg N	12	(5)
10 p/kg P ₂ O ₅	3	(1)
10 p/kg K ₂ O	7	(3)

Forage Rape & Hybrids

PHYSICAL DATA

(a) System

Grazed system which must be introduced gradually with an area of runback with alternative forage, e.g. grass/hay/straw, as well as free access minerals and water.

There are several hybrids (rape/kale) on the market which are quick to establish and can be utilised within 10-12 weeks after sowing. They offer the benefit of early grazing in summer/autumn if other forage supplies are limited. Hybrid crops can be managed for multiple grazings with sheep by sowing at a higher seed rate for greater leaf cover.

White-faced sheep breeds are prone to photosensitisation on this crop, be vigilant and remove any affected.

(b) Yield

Total dry matter yield of approximately 4.5t DM/ha. About 50 lambs/ha (20 lambs/acre) (starting weight approx. 27 kg) will finish off rape, with a suitable 'run back' on to grass or stubble.

(c) Seed

	kg/ha	(lb/acre)
Drilled	6	(5.3)
Broadcast	8	(7.1)

These rates will need to be varied with soil condition.

Seed cost – £4.78/kg.

(d) Fertiliser

	kg/ha (units/acre)	
	Drilled/broadcast	Direct drilled
N	100 (80)	140 (112)
P ₂ O ₅	25 (20)	25 (20)
K ₂ O	35 (28)	35 (28)

Catch crops after early potatoes would require less fertilisers. See page 4 for more information on nutrient planning.

(e) Sprays

Burn off land pre-drilling for direct drilled crops only.

Insecticide for flea beetle may be required.

Forage Rape & Hybrids

VARIABLE COST DATA

	Broadcast		Drilled		Direct drilled	
VARIABLE COSTS			£/ha (acre)			
Seeds	38		29		38	
Fertiliser	123		123		162	
Sprays etc.	-		-		14	
Other expenses	-		-		-	
	<u>161</u>	(65)	<u>152</u>	(62)	<u>214</u>	(87)

FERTILISER PRICE SENSITIVITY (+/-)

10 p/kg N	8	(3)	8	(3)	12	(5)
10 p/kg P ₂ O ₅	3	(1)	3	(1)	2	(1)
10 p/kg K ₂ O	4	(2)	4	(2)	3	(1)

Stubble Turnips

PHYSICAL DATA

(a) System

Grazed system which must be introduced gradually with an area of run-back with alternative forage e.g. grass/hay/straw as well as free access to minerals and water. Strip grazing is preferred to reduce wastage.

It can be grown with other brassicas e.g. rape, which would offer an element of protection for the stubble turnip from frost prior to grazing.

(b) Yield

Can be highly variable particularly affected by date of sowing; but drilled crops sown in early July can finish 50-70 lambs/ha (20-28 lambs/acre) (starting weight approx. 27kg), although often requiring cereal supplementation. Total dry matter yield approximately 4-5t DM/ha.

(c) Seed

Seed rates can be varied to alter the proportions of leaf to bulb.

	kg/ha
Direct drilled	5.0

Seed cost – £6.36/kg

(d) Fertiliser

These rates are variable, higher N rates increase the leaf to bulb ratio. See page 4 for more info on nutrient planning.

	kg/ha (units/acre)	
N	50	(40)
P ₂ O ₅	25	(20)
K ₂ O	50	(40)

(e) Sprays

Burn off land pre-drilling for direct drilled crops only.

Insecticide for flea beetle may be required.

Stubble Turnips

VARIABLE COST DATA

	Drilled		Direct drilled	
VARIABLE COSTS			£/ha (acre)	
Seed	29		29	
Fertiliser	219		219	
Sprays etc.	-		14	
Other expenses	-		-	
	<u>248</u>	(100)	<u>262</u>	(106)

FERTILISER PRICE SENSITIVITY (+/-)

10 p/kg N	9	(4)	9	(4)
10 p/kg P ₂ O ₅	10	(4)	10	(4)
10 p/kg K ₂ O	5	(2)	5	(2)

Swedes and Turnips

PHYSICAL DATA

(a) System

Hardy winter forage options which can be grazed or lifted and stored in a clamp. With any bulb crop, conserving the protein-rich leaf can be valuable to maintain a balanced diet, hence strip grazing is beneficial as it stops the animals grazing off the leaf first. A hard frost will kill the leaf, in which case additional protein will be required. For lifting and storing, roots must be clean and undamaged to prevent the risk of fungal disease.

(b) Yield

	Swedes		Turnips	
	Fresh	DM	Fresh	DM
	<i>roots, t/ha (t/acre)</i>			
Average	75 (30.4)	8.0 (3.2)	60 (24.3)	5.0 (2.0)
Premium	100 (40.5)	9.5 (3.8)	80 (32.4)	7.5 (3.0)

In addition, turnips will yield 15 to 30 t leaf/ha (1.5 to 3.0 t DM).

(c) Seed

Swede sown at 3.75kg/ha. A precision drill can be used if available to reduce the amount of seed to 0.4 to 1 kg/ha.

Turnip sown at 2.5 to 5kg/ha.

Seed cost (£/kg):

Swedes – graded 100

Turnips – treated 14.00

(d) Fertiliser

See page 4 for more info on nutrient planning.

	Swedes		Turnips	
	<i>kg/ha (units/acre)</i>			
N	90	(72)	90	(72)
P ₂ O ₅	200	(160)	200	(160)
K ₂ O	150	(120)	125	(100)

(e) Sprays

Pre-emergence herbicide for annual grass and broad-leaved weeds.

Insecticide for flea beetle may be required.

Swedes and Turnips

VARIABLE COST DATA

	Swedes		Turnips	
VARIABLE COSTS			£/ha (acre)	
Seed	41		70	
Fertiliser	94		94	
Sprays etc.	28		28	
Other expenses	-		-	
	<u>163</u>	(66)	<u>192</u>	(78)

FERTILISER PRICE SENSITIVITY (+/-)

10 p/kg N	4	(2)	4	(2)
10 p/kg P ₂ O ₅	2	(1)	2	(1)
10 p/kg K ₂ O	5	(2)	5	(2)

Multi-Species Sward

PHYSICAL DATA

(a) System

Reseed incorporating various grasses, herbs and legumes such as chicory, plantain and white clover. The crop is best utilised in a rotational grazed system. Around five days longer rest period and greater residuals required compared with ryegrass and white clover swards. Longevity of the sward is better when not winter grazed. The crop should be rested, typically by mid-September in the year of establishment and by November thereafter. Additional animal health benefits provided, along with drought resilience benefits.

(b) Yield

Variable, better in warmer soils. Adopt a restricted grazing period in year one. 10-20 ewes and twins/ha (4-8 ewes and twins/acre) can be grazed in years 2 and 3, typically from June, and lambs during that autumn.

(c) Seed

Rate – 10 kg/ha.

Sow into a fine, warm and firm seedbed by early June.

Seed costs: Cost annualised over an assumed three-year rotation.

(d) Fertiliser

	kg/ha	(units/acre)
N	50	(40)
K ₂ O	25	(20)
P ₂ O ₅	25	(20)

Little or no fertiliser is required where established on a prime site using legumes. See page 4 for more info on nutrient planning.

(e) Sprays

An annual charge to cover pre-drilling stale seed bed preparation.

Otherwise, few clover-safe herbicides available for use. Poor competitor so good establishment is critical. The only option to control tall weeds post-emergence is topping.

Multi-Species Sward

VARIABLE COST DATA

VARIABLE COSTS	Direct drilled £/ha (acre)
Seed	55
Fertiliser	88
Sprays etc.	5
Other expenses	-
	<hr/>
	148 (60)

FERTILISER PRICE SENSITIVITY (+/-)

10 p/kg N	5	(2)
10 p/kg P ₂ O ₅	3	(1)
10 p/kg K ₂ O	3	(1)

Fodder Beet

PHYSICAL DATA

(a) System

Fodder beet can be grazed behind an electric fence or harvested and fed as chopped or whole. If harvesting the crop, try to minimise soil contamination. It has a large yield potential, for a palatable, digestible feed for animals through the winter. This crop is not a brassica.

Transition of animals on and off the crop requires careful consideration, especially that of cattle *(continued on next page).

(b) Yield

	Roots - t/ha (t/acre)			
	Fresh		DM	
Average	60	(24.3)	10	(4.0)
Premium	90	(36.4)	14	(5.7)

In addition, fodder beet will yield 35 t leaf/ha (3 to 4 t DM at 18-20%CP); as winter progresses this may die off with frost and snow damage, additional protein should be fed.

(c) Seed

Pelleted monogerm seed precision drilled at 15 cm spacing in 55 to 65 cm rows (approx. 3-4 kg/ha). Treated seed is available at a premium cost.

(d) Fertiliser

	kg/ha	(units/acre)
N	100	(80)
P ₂ O ₅	60	(48)
K ₂ O	150	(120)

Potash level may be reduced to 75 kg/ha where agricultural salt (400 kg/ha) is applied.

All or part of the nutrient requirement can be satisfied with slurry or FYM. See page 4 for more info on nutrient planning.

(e) Sprays

Pre-emergence broad leaved weed control and then up to four post emergence applications at low rates.

Fodder Beet

VARIABLE COST DATA

VARIABLE COSTS	£/ha (acre)
Seed	200
Fertiliser	247
Sprays etc.	184
Other expenses	-
	<hr/>
	631 (255)

FERTILISER PRICE SENSITIVITY (+/-)

10 p/kg N	10	(4)
10 p/kg P ₂ O ₅	6	(2)
10 p/kg K ₂ O	15	(6)

* Cattle should be transitioned over 21 days, starting with 1kg DM per animal per day until all cattle are eating bulbs readily, then increase by 1kg DM every two days until they start to leave some beet behind.

Ensure animals have received vaccinations for clostridial infections prior to grazing the crop, as beet can increase the chance of such infections due to the high sugar load in the intestines. See Fodder Beet page on the FAS website (www.fas.scot) for more information.

Red Clover

PHYSICAL DATA

(a) System

Red clover-ryegrass mixtures provide a good silage crop whilst offering high quality aftermaths for finishing lambs. Up to 300g per day growth rate is possible for weaned lambs grazing red clover. Not suitable for winter grazing or intense autumn grazing. Be vigilant of digestive issues such as bloat or twisted gut.

Phyto-oestrogens affect ewe fertility so avoid grazing 6 weeks either side of tupping and limit the grazing of replacement breeding animals on swards with over 30% red clover as there is some evidence that it affects reproductive tract development.

(b) Yield

	t/ha (t/acre) Fresh	DM
Average	37	10
Premium	56	15

(c) Seed

For a high red clover sward:

15kg/ha (6kg/acre) red clover

5kg/ha (2kg/acre) grass seed

Spring sowing at 10-15mm depth when soil temperatures exceed 10°C works best.

(d) Fertiliser

	kg/ha	(units/acre)
N	0	(0)
P ₂ O ₅	70	(56)
K ₂ O	70	(56)

P and K application should be guided by recent soil analysis. Clover require higher pH than grasses, target 6-6.5. Nitrogen application is not required. See page 4 for more information on nutrient planning.

(e) Sprays

Do not use residual herbicides on previous crops that could affect germination of clover.

Red Clover

VARIABLE COST DATA

VARIABLE COSTS	£/ha (acre)
Seed @ £10.6/kg	183
Fertiliser	113
Sprays etc.	-
Other expenses	-
	<hr/>
	296 (120)

FERTILISER PRICE SENSITIVITY (+/-)

10 p/kg N	0	(0)
10 p/kg P ₂ O ₅	7	(3)
10 p/kg K ₂ O	7	(3)

Livestock

Livestock Units

	Livestock units		Livestock units
Dairy cows	1.00	<u>Ewes and ewe replacements</u> ³	
Dairy bulls	0.65	Hill Ewes	0.06
Beef cows	0.75	Upland Ewes	0.08
Beef bulls	0.65	Lowland Ewes	0.11
Heifers in calf (rearing)	0.80	Rams	0.08
<u>Other cattle</u> ¹		<u>Lambs</u>	
0-12 months	0.34	Store lambs <1 year	0.04
12-24 months	0.65	Breeding ewe hoggs:	
Over 24 months ²	0.80	6 months – 1 year	0.06
Horses	0.80	Other sheep > 1 year	0.08

¹ excluding intensive beef systems

² reduced in proportion to time animal on farm

³ excluding suckling lambs

Notes

1. A Livestock Unit is usually defined in terms of feed requirements. The ratios in the table above are based on metabolisable energy requirements, with one unit being considered as the maintenance of a mature 625 kg Friesian cow and the production of a 40-45 kg calf, and 4,500 litres of milk at 36 g/kg of butterfat and 86 g/kg solids-not-fat.
2. To calculate the stocking density of grazing livestock allowances should strictly be made for variation in output, e.g., yield per cow or liveweight gain per head, and also for quantities of non-forage feed consumed by each category of stock.
3. To calculate the total livestock units on a farm, reduce in proportion the time animals are on farm within any year. The appropriate livestock units should be multiplied by the monthly average livestock numbers, except in the case of lambs and purchased stores where throughput should be used.
4. Because of the range in breed and type of animal within any one category (e.g. Friesian and Jersey dairy cows), the results obtained from the use of these figures must be interpreted with care.
5. Livestock units used by the Scottish Government for calculating stocking densities as part of eligibility for subsidy schemes differ slightly. See page 468 for more detail.

Basis of data: Defra, 'Definitions of Terms used in Agricultural Business Management' (July 2024).

Livestock Traceability

Cattle

All cattle are required to have a 'passport'. Without a passport, cattle cannot be slaughtered for human consumption.

Cattle are required to be double tagged. Beef calves must have both tags fitted within 20 days of birth. Dairy calves must have one tag fitted within 36 hours of birth and the second tag fitted within 20 days of birth. **NOTE:** For all calves born in Scotland, births must be registered with ScotMoves+ (www.scoteid.com) within **7 days of tagging** and within 27 days of birth. Lost or illegible tags (including those with backs or fronts missing), must be replaced within 28 days of discovery.

Deaths must be reported and passports returned within 7 days. If the animal is over 24 months of age, it must be tested for BSE.

When an animal moves from one holding to another, both off and on movements should be recorded in the holding register within 36 hours of the movement taking place. For further guidance see www.scoteid.com.

An on-farm record must be retained for all cattle on the holding. All dairy births (within 7 days), any other calf (within 30 days), deaths (within 7 days) and movements (within 48 hours) all need to be recorded in farm records. These records must be retained for a 10-year period. A copy of a herd register can be downloaded at www.fas.scot/downloads/sample-blank-herd-register-bovine-animals/.

In Scotland, links between holdings no longer apply. To keep cattle you must register each holding that you use (owned, rented, or seasonally rented) with ScotMoves (<http://www.scoteid.com/>). Cattle moving to and from the different holdings (location codes) within a business must be recorded with ScotMoves within 48 hours of moving. This can be done by email, online, telephone/fax, paper or by using software packages. The keeper must be registered as a keeper of cattle at the receiving holding and no more than one keeper can be registered on that holding. Full details including possible exemptions can be found at www.scoteid.com.

Exporting Livestock to EU

Following Brexit, all animals exported need to have an ear-tag with the country code 'GB', there are various options depending on whether the animals are currently tagged with UK tags or not. The simplest approach is to speak to your tag supplier.

Cattle tagging EID changes

Each country (England, Wales, Scotland and Northern Ireland) are developing their own traceability systems for cattle and sheep as part of a replacement scheme for BCMS.

There has been a recognition that EID is the way forward but timescales and the systems to be used are under discussion in each country. However, it should be noted that EID is not compulsory in cattle.

In Scotland, Ultra-High Frequency (UHF) tagging is the preferred technology by ScotGov as it has many advantages. The technology is cheaper, they are WYSIWYG (what you see is what you get) compatible, they can be read singly or in batches at a greater distance, they don't interfere with LF tags, and they can be encoded with information.

Currently, UHF tags are voluntary and available. ScotEID are encouraging producers to switch voluntarily to them, due to their advantages. A new consultation was undertaken in June 2024 to gauge the level of support across the whole supply chain. This must be evaluated before decisions are made. Implementation will require new domestic legislation, this can't happen until a decision on the future is made. At present, until there is an agreed UK position on cattle re-numbering for LF (Low Frequency), Scottish cattle keepers have two options regarding EID for cattle, to use current LF non-WYSIWYG tags and readers or to voluntarily use ScotEID UHF WYSIWYG tags.

Sheep

To keep sheep, you must register each holding that you use (owned, rented or seasonally rented) with your local Rural Payments and Inspections Directorate (RPID) office. It is compulsory for all Scottish sheep born after 31 December 2009 to be tagged with an Electronic Identifier (EID) before they leave the holding of birth (unless under a concession) or are 9 months old, whichever comes first.

There are three types of tag that can be used:

- Slaughter Tags (a single EID tag with a flock mark and no visible individual identifier).
- A matching set of double tags with individual identifiers, one of which must be an EID tag.
- An EID bolus and black ear tag.

All sheep that are to be sold or slaughtered by the time they are one year old can be identified with any one of the above tags (tag types must not be mixed). However, the most common type for sheep under 12 months old are slaughter tags for store and finished lambs.

Any animals kept beyond 12 months of age must have a matching set of double tags with individual numbers – one an EID tag. Any slaughter tagged animals that are to remain on the holding after they are a year old, must be upgraded (provided they are completely traceable) by removing the slaughter tag and replacing with a matching set of double tags with individual identifiers one of which must be an EID tag on or before they are one year old. These must be recorded in the replacement register.

A record of identification must be kept in the flock records with the date the animals were EID tagged and their individual number if double tagged or flock number if slaughter tagged. Batch recording can be used.

Any homebred sheep losing their tags must have them replaced within 28 days of discovery. If they are on the holding of birth you can use your existing double tags one of which must be EID. If the sheep are not on the holding of birth, then red replacement EID tags must be used. The exception to this is upgrading bought in ewe lambs that can be upgraded to your own existing tags provided they are fully traceable. Replacement tags must be recorded in the flock records.

Flock books should include a section on identification and replacements and a continuous record must be kept. The register must be retained for three years. A holding register (orange book) is downloadable from the Farm Advisory Service website www.fas.scot/downloads/blank-flock-register/.

Records for all on/off movements, identification and replacement of tags must be completed in the register within 48 hours. An annual flock inventory must be completed usually with the December Census.

All sheep movements in Scotland must be reported to SAMU (Scottish Animal Movements Unit) within 3 days. Any EID animals moving through Scottish Critical Control points (markets, abattoirs etc) are logged and uploaded to the ScotEID database. These movements can form part of your records. The ScotEID website (www.scoteid.com) is a source of information on tagging rules and regulations as is Scottish Government's own website at www.gov.scot/Topics/farmingrural/Agriculture/animal-welfare/IDtraceability/SheepandGoats

Goats

The rules for goats are identical to sheep except the EID component is not compulsory and tattoos can be used.

Deer

To keep deer, you must register each holding that you use (owned, rented or seasonally rented) with your local Rural Payments and Inspections Directorate (RPID) office. Deer must be identified as required by the Tuberculosis (Deer) Order 1989 (as amended) before moving on or off a holding and before a TB test (unless under 16 weeks old). The owner/keeper must complete a movement declaration found at: <https://www.gov.scot/publications/animal-health-movement-restrictions/pages/exemptions/>

The movement declaration must be retained on the premises of departure for six months.

Pigs

To keep pigs, you must register your holding with the local RPID office and obtain a County Parish Holding (CPH) number for every holding that

you use within 30 days of when pigs are first kept. You must also contact your local Animal Health Office (AHPA) to register as a keeper of pigs and also to obtain a pig herdmark. All pigs born on your holding must be identified before leaving the holding of birth by an eartag or a permanent tattoo (either on the ear or a slapmark on the shoulder). See www.gov.scot/publications/pig-identification-registration-guidance-keepers-scotland/.

If under 12 months old, a temporary mark (paint) can be used for farm-to-farm movements only. For all movements to a show or exhibition, for breeding purposes, to a semen collection centre or, intra-community trade or export or under a walking licence, all pigs must also have an eartag or a tattoo with the herd mark and a unique individual identification number) not a slapmark. A slapmark, eartag or tattoo can be used for movement to a market or slaughterhouse. All replacement tags must be cross referenced in the holding register.

Movements must be notified either prior to leaving the holding or on the day of the move. This can be done electronically through www.scoteid.com or by telephone or in writing to the ScotEID information Centre. The receiving keeper must check and confirm receipt of pigs within 3 days of their arrival. The movements also need to be noted in the holding register within 48 hours of the move. These records must be kept for a minimum of 3 years and once a year, the pigs on the holding must be recorded. ScotEID can be used for this. Rules for movements between England, Wales and Northern Ireland, and for imports and exports can be found at: www.gov.scot/publications/pig-identification-registration-guidance-keepers-scotland/pages/5/

Poultry

Following the UK's worst ever outbreak of Avian Influenza in October 2021, new measures have been taken to protect the poultry industry from bird flu. From 1st September 2024, all bird keepers – even those who keep a single bird - must register their bird location(s) on the new Scottish Kept Bird Register (SKBR). A link will be available at <https://www.gov.scot/publications/avian-influenza-bird-flu/pages/register-your-birds/> from the 1st September.

Premises where birds are kept must be re-registered on the new SKBR on 1 September if they were previously registered on the Great Britain Poultry Register (GBPR).

Keepers must register, or re-register, their bird location(s) online or by telephone between 1 September and 1 December 2024. This is a legal requirement. Details must be updated at least annually.

The registration requirement does not apply to birds on the premises that belong to the order Psittaciformes (parrot family, including budgerigars) or Passeriformes (perching birds, including jays and finches), which have no access to the open air.

Registration will be free, quick and simple. Once registered, keepers can access their information online at any time. Movement records must be kept for poultry and/or eggs. Where the breeding, laying or broiler flock has more than 250 birds, salmonella testing records must be kept.

All livestock movements

All movements of cattle, sheep, goats and other ruminating animals (except camelids) and swine are subject to a standstill period (unless an exemption applies). This period of standstill, in effect, does not permit the movement of any animal to a market if it has been presented at a market within the previous 13 days (20 for pigs), or an English or Welsh market within the previous 6 days (20 for pigs), except any animal marketed in a livestock market in any of the Scottish island areas. Many exemptions apply and they can be found at:

<https://www.gov.scot/publications/animal-health-movement-restrictions/pages/exemptions/>

Animal Health Planning

Effective livestock health planning is an auditable, team driven process that continuously safeguards and improves animal health, welfare, and production efficiency.

SRUC Veterinary Services have been working on the development of the HerdPlan, a new health planning tool that aims to make effective livestock health management quicker and easier for farmers and vets. The HerdPlan is currently available to early adopter farmer and vet users and will be launched in autumn 2024.

The tool can be used to:

- Connect the whole team, including the farmer, their staff, vet and consultants.
- Make an effective livestock health plan with the team quickly and easy.
- Ensure that livestock health events get done timely by using reminders.
- Respond to new health threats by accessing flexible modules for individual diseases or health problems.
- Work continuously with the whole team to improve herd/flock performance.
- Ensure compliance with farm assurance schemes.

Interested UK farmers and vets can register their interest at www.herdplan.co.uk. The current health planning service (SAHPS: The Scottish Animal Health Planning System) will continue to be supported while HerdPlan is further developed and launched. SRUC's Health Planning Services and developments have been supported by the Scottish Government.

The Scottish Government has also introduced Animal Health and Welfare Interventions under their Preparing for Sustainable Farming (PSF) support package. There is a total of nine interventions that Scottish farmers can undertake and any investigations and actions related to those interventions must be completed by 31 December 2024 and any claims submitted by 28 February 2025.

Full details can be found at <https://www.ruralpayments.org/topics/all-schemes/preparing-for-sustainable-farming--psf-/>

Premium livestock health schemes

The Premium Health Schemes run by SRUC Veterinary Services provide an important framework for establishing the disease status of a flock or herd. These national schemes offer an effective programme of testing and management to control multiple infectious endemic diseases in cattle, sheep and goats for both pedigree and commercial flocks and herds across the UK. Buyers of breeding replacements and breed societies are increasingly demanding stock sold with Certified Accredited health status and it is a requirement for export in some countries.

SRUC works in close partnership with veterinary practices and farmer subscribers to offer a cost-effective programme for the reduction, eradication, and certification of freedom from infectious endemic disease. SRUC has two health schemes:

- **The Premium Cattle Health Scheme (PCHS)** which is one of the largest Cattle Health Certification Standards (CHeCS) licensed schemes and covers bovine viral Diarrhoea (BVD), Johne's disease, infectious bovine rhinotracheitis (IBR), leptospirosis and neospora, alongside the CHeCS Bovine TB Herd Accreditation programme www.cattlehealth.co.uk.
- **The Premium Sheep and Goat Health Schemes (PSGHS)** offers both Accreditation and a newer Monitoring option and covers Maedi Visna (MV), Caprine Arthritis Encephalitis (CAE) and Johne's Disease. SRUC also provides a Scrapie Monitoring Scheme for export and Scrapie Genotyping for selective breeding www.sheepandgoathealth.co.uk.

Veterinary medicine records

The principle behind record keeping requirements is to ensure the traceability of medicines, which is crucial for public health and animal welfare. For example, the veterinary medicine records can be reviewed in case the recall of a medicine, due to contamination or a manufacturing defect in a particular batch, is required. The review will allow to identify the keeper of food-producing animals supplied with the affected batch and the animals that have been treated with it. This will permit the appropriate measures to be in place to prevent any potential harmful residues entering the food chain.

Keepers of food-producing animals or people that treat farm animals intended for human consumption, must keep records for at least 5 years following the administration or other disposal of the product, irrespective of whether or not the animal concerned is no longer in the keeper's possession or has been slaughtered or has died during that period.

They must include:

- A record of the proof of purchase or, where medicines were not bought, documentary evidence of how they were acquired.
 - ✓ name and batch number of the product
 - ✓ date of purchase
 - ✓ quantity purchased
 - ✓ name and address of the supplier
- A record of all veterinary medicine products administered to the animals, including those administered by the vet.
 - ✓ name and batch number of the product
 - ✓ date of administration
 - ✓ quantity administered
 - ✓ identification of the animal treated
 - ✓ withdrawal period
 - ✓ name of person/vet that administered the product
- A record of the disposal of all veterinary medicine products that have not been used for animal treatment.
 - ✓ date of disposal
 - ✓ quantity of product involved
 - ✓ how and where it was disposed

All records must be durable, permanent, and made available for inspection on request by an authorised person. The records may be kept electronically either at the various Farm Management Software Applications and/or at <https://emb-pigs.ahdb.org.uk> and <https://ahdb.org.uk/medicine-hub> for pig and dairy, beef, sheep producers respectively.

Nutritive Values and Relative Values (£) of Feedingstuffs

The feedingstuffs tables overleaf are provided as a general guide and should be used with care. Each foodstuff has been attributed a specific nutritive value and often this will vary, e.g. the nutritive value of draff (see page 121). The relative values of the feedingstuffs are also affected by the rationing situation.

The relative values for ruminants are calculated on an ME (metabolisable energy) and CP (crude protein) basis using barley and rapeseed meal as standard reference foods. The relative values for pigs are calculated on

a NE (net energy) and Dig Lys (digestible lysine) basis, using barley and hipro soya as standard reference foods.

If the relative value of a foodstuff is higher than the price then it is good value for money. For ruminants, this does not take into account other characteristics of the feedstuff, for example, the high digestible undegradable protein (DUP) content of soya bean meal for ewes in late pregnancy or digestible fibre properties of sugar beet pulp. For pigs, relative value does not take into account the content of other amino acids and for both types of animal the negative characteristics such as low palatability.

Nutritive values of feedingstuffs-ruminants

	Dry matter (g/kg)	ME (MJ/kg DM)	CP (g/kg DM)
Rapeseed meal	900	12.0	400
Barley	860	13.2	115
Hay (average)	850	8.6	85
Hay (good)	860	9.2	100
Silage (average)	240	10.6	130
Silage (good)	240	11.2	140
Barley straw	860	6.3	35
Oats	870	12.0	100
Wheat	860	13.6	115
Maize	860	13.8	95
Brewers grains (draff)	230	11.1	200
Wheat dark grains	900	13.5	340
Maize dark grains	900	14.0	317
Maize gluten (20%)	880	12.9	220
Soya bean meal (47%)	890	13.3	530
Potatoes	210	13.3	90
Swedes	105	14.0	90
Molassed sugar beet feed	890	12.5	100

Relative values (£) of feedingstuffs-ruminants

	£/t					
	300		350			
RAPESEED MEAL						
BARLEY	175	200	225	175	200	225
Hay (average)	115	131	146	116	132	148
Hay (good)	129	145	161	131	147	164
Silage (average)	43	48	53	45	50	55
Silage (good)	46	51	56	48	53	58
Barley straw	74	87	101	70	84	97
Oats	157	181	204	155	179	203
Wheat	170	198	227	166	194	221
Maize	174	202	231	169	193	226
Brewers grains (draff)	51	55	58	55	59	62
Wheat dark grains	287	296	305	324	319	331
Maize dark grains	281	294	306	314	326	338
Maize gluten (20%)	221	238	255	238	255	272
Soya bean meal (47%)	368	361	354	438	431	424
Potatoes	40	46	53	39	45	52
Swedes	21	24	28	20	24	27
Molassed sugar beet feed	165	191	217	163	189	214

Nutritive values of feedingstuffs-pigs

	NE (MJ/kg as fed)	Dig Lys (g/kg as fed)
Hipro soya bean meal	8.4	26.6
Barley	9.6	2.8
Oats	8.0	3.0
Wheat	10.5	2.5
Wheat feed	7.7	4.6
Wheat bran	6.2	4.0
Maize	11.1	1.8
Wheat dark grains	9.3	5.6
Maize gluten (20%)	7.0	4.0
Peas	9.7	12.5
Beans	8.6	12.8
Molassed sugar beet feed	6.6	2.9
Molasses	7.0	0.1
Biscuit waste	11.7	2.5
Rapeseed meal	6.5	14.0

Relative values (£) of feedingstuffs-pigs

	£/t					
HIPRO SOYA BEAN MEAL	350		400			
BARLEY	175	200	175	200	175	200
Oats	151	171	192	153	173	193
Wheat	187	215	243	186	214	241
Wheat feed	160	177	195	164	182	200
Wheat bran	131	145	159	135	150	164
Maize	191	221	251	188	218	248
Wheat dark grains	193	215	236	199	221	242
Maize gluten (20%)	144	160	176	148	164	181
Peas	256	272	289	276	292	309
Beans	241	254	267	262	275	288
Molassed sugar beet feed	128	145	161	130	147	163
Molasses	112	132	152	108	128	148
Biscuit waste	206	237	268	204	235	267
Rapeseed meal	217	223	229	242	248	254

Gestation Table

Gestation Table

Date of service	Births due			Date of service			Births due			Date of service			Births due			
	Cow	Ewe	Hind	Sow	Cow	Ewe	Hind	Sow	Cow	Ewe	Hind	Sow	Cow	Ewe	Hind	Sow
01-Jan	12-Oct	30-May	19-Aug	24-Apr	06-May	15-Feb	03-Oct	23-Dec	28-Aug	08-Sep	20-Jun	05-Feb	27-Apr	31-Dec		
06	17	04-Jun	24	29	11	20	08	28	02-Sep	13	25	10	02-May	05-Jan		
11	22	09	29	04-May	16	25	13	02-Jan	07	18	30	15	07	10		
16	27	14	03-Sep	9	21	02-Mar	18	07	12	23	05-Jul	20	12	15		
21	01-Nov	19	8	14	26	07	23	12	17	28	10	25	17	20		
26	06	24	13	19	31	12	28	17	22	03-Oct	15	02-Mar	22	25		
31	11	29	18	24	05-Jun	17	02-Nov	22	27	08	20	07	27	30		
05-Feb	16	04-Jul	23	29	10	22	07	27	02-Oct	13	25	12	01-Jun	04-Feb		
10	21	09	28	03-Jun	15	27	12	01-Feb	07	18	30	17	06	09		
15	26	14	03-Oct	8	20	01-Apr	17	06	12	23	04-Aug	22	11	14		
20	01-Dec	19	8	13	25	06	22	11	17	28	09	27	16	19		
25	06	24	13	18	30	11	27	16	22	02-Nov	14	01-Apr	21	24		
02-Mar	12	30	19	24	05-Jul	16	02-Dec	21	27	07	19	06	26	01-Mar		
07	17	04-Aug	24	29	10	21	07	26	01-Nov	12	24	11	01-Jul	06		
12	22	09	29	04-Jul	15	26	12	03-Mar	06	17	29	16	06	11		
17	27	14	03-Nov	9	20	01-May	17	08	11	22	03-Sep	21	11	16		
22	01-Jan	19	8	14	25	06	22	13	16	27	08	26	16	21		
27	06	24	13	19	30	11	27	18	21	02-Dec	13	01-May	21	26		
01-Apr	11	29	18	24	04-Aug	16	01-Jan	23	26	07	18	06	26	31		
06	16	03-Sep	23	29	09	21	06	28	01-Dec	12	23	11	31	05-Apr		
11	21	08	28	03-Aug	14	26	11	02-Apr	06	17	28	16	05-Aug	10		
16	26	13	03-Dec	8	19	31	16	07	11	22	03-Oct	21	10	15		
21	31	18	8	13	24	05-Jun	21	12	16	27	08	26	15	20		
26	05-Feb	23	13	18	29	10	26	17	21							
01-May	10	28	18	23	03-Sep	15	31	22	26							

Note: Refer to the Miscellaneous section for gestation values for the above livestock. Values will change for different breed types.

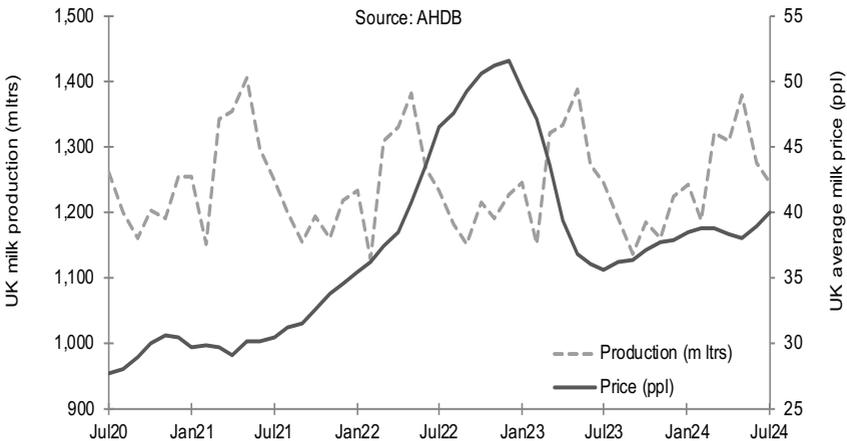
Dairying

Introduction

Farm-gate milk prices and price drivers

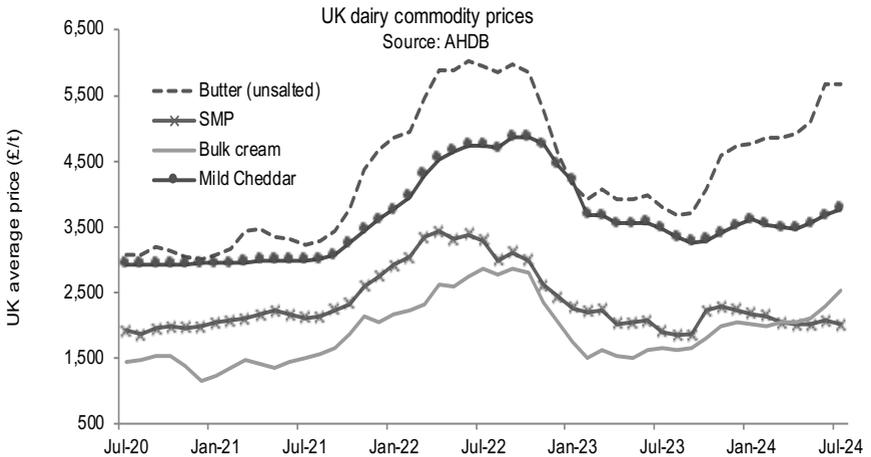
The UK average farm-gate milk price has slowly risen from 36.43ppl in September 2023 to 41.06ppl in August 2024, a rise of 4.63ppl over the 12 month period. For the start of the 2024/25 milk year, UK milk production has been below the previous year on the back of a very wet spring, with cold weather lasting well into June, meaning a late turnout and poorer grass growth than normal. As a result, the spring flush was subdued, peaking at 44.99 million litres/day compared to 45.35 million litres/day in the previous year, helping keep milk prices firm and rising slightly into the summer months. UK milk supply for the 2023/24 milk year was 14,890 million litres, down 17 million litres from the previous year. The UK average farm-gate milk price declined initially at the start of the 2023/24 milk production year with a high of 39.45ppl in April 2023, and finishing the milk year at 38.84ppl for March 2024.

UK average farmgate milk price versus UK production



The UK farm-gate milk price is mainly driven by the commodities market. Dairy fats (butter and cream) have increased significantly in price over the 12-month period from July 2023 to July 2024, due to lower milk volumes in the autumn of 2023, both in the UK and on the continent, and overall lower global production. During this period butter has increased from £3,790/t in July 2023 to £5,680/t in July 2024. Cream has followed the butter trend, from a low of £1,644 in July 2023 to a high of £2,528/t in July 2024. The market for cheddar also increased, reaching £3,770/t in July 2024, from a low of £3,260/t in September 2023. Going into 2024, cheese prices started to rise as stocks became tight and there was a significant drop in Irish milk production on the back of low milk prices, poor weather for grazing conditions and new nitrate regulations. At the time of writing August 2024), the skim milk powder (SMP) price (July

2024) was £2,010/t, back £160/t from the start of 2024. The increase in commodity prices over the last 12 months has mainly been due to lower milk output, tightening stocks and increased consumer demand as inflation started to fall.



World milk supplies for April 2024 were 0.5% below the same month in 2023, with average daily deliveries of 832.5 million litres. According to Rabobank, recovery of global milk prices has been slower than expected as inflation remains above target in many countries and high interest rates are still impacting consumer spending. Global demand has still been weak and with increasing domestic production in China, their import demand has been reducing, particularly for SMP. China's dairy imports are expected to be 8% lower than they were in 2023.

The US and South America have seen their dairy herd numbers decline due to low margins, and adverse weather conditions have impacted milk output in the EU (excess rain) and New Zealand (drought). It is predicted that global milk production from the key exporting regions will start to show some modest growth during the second half of 2024, after production being slightly below the previous year for the first half of 2024 because of sluggish global demand. Growth is expected to be driven by improved margins as the year progresses, with feed costs expected to reduce.

Milk supply contracts

All UK dairy farmers are contracted to supply milk to an individual milk purchaser/processor. A select number of dairy farmers are on retailer-aligned contracts. Farmers on these contracts receive a milk price based on a cost of production formula used by the individual retailer. As of July 2024, aligned milk contracts were in the region of 40ppl–43ppl for a liquid standard litre. The majority of non-aligned farm-gate milk prices are in the region of 37ppl–40ppl for a liquid standard litre, based on 4% butterfat

and 3.3% protein (as at June 2023) and are likely to remain firm into the autumn of 2024.

The price paid for milk sold for manufacturing purposes places more emphasis on compositional quality, with a standard manufacturing litre being based on 4.2% butterfat and 3.4% protein. These contracts typically pay around 1.3ppl more than the liquid standard litre. Depending on the contract, bonuses and penalties are awarded with milk composition and hygiene quality being either above or below the standard litre respectively. For hygiene quality, a standard litre is based on a bactoscan of 30,000/ml, somatic cell count (SCC) of 200,000/ml and thermodurics of 500/ml.

Additional bonuses for milk collections may include every other day collections, volume bonuses and flexible collection times.

Fixed price contracts

From time to time, some milk purchasers offer fixed contracts, allowing producers to fix a certain proportion of their milk volume at a given price for a period of time. 'Futures contracts' allow farmers to reduce their exposure to market volatility with regards milk price and to plan ahead with purchasing key inputs such as feed and fertiliser. Futures broker StoneX Group Inc. calculates regular forward milk prices based on European milk futures contracts and currency exchange rates.

Cost of production

For the 2023/24 milk year the cost of production was estimated at 43.4ppl by The Dairy Group. Despite variable costs easing over the last two years, fixed costs have continued to increase, due to higher labour costs, interest rates, and inflation. It is unlikely that the cost of production will fall below 40ppl anytime soon, meaning margins are extremely tight given that milk price is around 40ppl.

Outlook

Domestic milk production (for GB) is predicted to reach 12.20 billion litres for the 2024/25 season, which is 1% lower than 2023/24 (AHDB Dairy). While farmgate prices have been rising slightly throughout the summer of 2024, input costs are still at historically high levels although inflation on input costs has eased recently. However, forage quality is in question, given the very wet spring and summer, and concerns around forage shortages and high prices for straw mean that winter feeding could be costly to maintain current levels of production. More milk price rises are needed to incentivise production, given that cost of production is currently higher than the price being paid by many processors. The extent of a return to positive margins (and when) is always difficult to predict, with increasing volatility in dairy markets from both domestic and global supply, as well as demand fluctuations, adverse weather patterns, and geopolitical events which can impact greatly on input costs.

Lactation Curves

The table below is an example of a lactation curve for a cow yielding 7,000 litres and can be used for budgeting purposes.

Month	Yield each month for a cow yielding 7,000 litres											
	Month of calving											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
January	12.3	-	-	4.7	6.4	7.4	8.5	9.6	10.6	11.8	12.9	13.4
February	12.0	11.0	-	-	4.5	5.9	6.8	7.7	8.6	9.7	10.8	11.6
March	13.0	13.5	12.4	-	-	5.3	6.8	7.7	8.6	9.8	10.9	12.0
April	11.9	12.8	13.4	12.4	-	-	5.3	6.7	7.6	8.6	9.8	10.8
May	12.1	13.2	14.3	15.1	14.1	-	-	6.0	7.5	8.6	9.7	10.8
June	10.4	11.7	12.8	13.8	14.6	13.8	-	-	6.0	7.3	8.3	9.4
July	8.7	9.9	11.0	12.0	13.2	14.1	13.1	-	-	5.5	6.9	7.9
August	7.5	8.5	9.4	10.6	11.7	13.0	13.9	12.8	-	-	5.3	6.6
September	6.7	7.5	8.4	9.5	10.8	12.0	13.4	13.9	12.8	-	-	5.3
October	5.4	6.8	7.6	8.6	9.7	11.2	12.5	13.6	14.2	13.1	-	-
November	-	5.1	6.1	7.0	7.9	9.1	10.3	11.5	12.5	13.0	12.1	-
December	-	-	4.6	6.3	7.1	8.2	9.4	10.5	11.6	12.6	13.3	12.2
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

These figures are broadly applicable to other yield levels.

It should be noted that the figures are intended only as a general guide and that annual yield and that annual yield, milking frequency, lactation number, calving index, feeding regime and geographical area will all affect the actual curve obtained.

Dairy Cow - Summary of Assumptions

(a) Milk Price 2024

The following gross margins include four annual yield levels, based on average production of 1,000,000 litres per annum:

Litres /cow	Calving system	Contract type	Average price (ppl) *
5,000	Spring	Manufacturing	41.0
7,000	All year round	Manufacturing	41.0
8,500	All year round	Liquid	40.0
10,000	All year round	Liquid	40.0

* Use price sensitivity to change gross margins to reflect current milk price.

Note that calving system and contract type are not specific to average yield per cow and it is not unusual for higher yielding herds to be on manufacturing contracts. Similarly, block calving herds (whether spring or autumn or both, are capable of much higher yields than 5,000 litres).

(b) Feeding

The systems shown are all based on a grass silage feeding regime. As milk yield increases, forage quality becomes more critical. Although high milk yields can be achieved using conventional systems based on grass, grass silage and concentrates, the inclusion of a second forage, such as a wholecrop cereal or maize silage, will normally enhance intake and performance as will forage replacers such as draff or grainbeet along with other distillery by-products, fodder beet and potatoes. To avoid excessive concentrate use (target concentrate use per litre should be less than 0.4kg), good grassland management and well-preserved grass silage with high intake characteristics are key. Multi-cut silage, with 4 or 5 cuts/year can improve forage quality and reduce demand for purchased concentrates and protein sources.

Many different feeding systems exist. A TMR (Total Mixed Ration) is where cows receive 100% of their nutrition in a mixed ration fed in the feed trough. PMR (Partial Mixed Ration) is where cows are fed a base ration with additional concentrates fed at a rate depending on their level of milk production. Typically, feeding to yield is based on providing 0.45kg concentrate per litre over the base ration through the parlour, robot or out of parlour feeders.

Dairy farmers can replace part or all the purchased compound dairy cake or blends with home mixes using home-grown cereals and purchased straights. These mixes typically cost around £20/t less than purchased product, but they do, however, incur greater demand on labour and machinery and require more storage

capacity.

(c) Other livestock expenses

These are based on commercial dairy herds and include milk recording, sawdust, dairy detergents, and feeding straw.

Dairy Cow - Spring Block Calving

PHYSICAL DATA

Calving period	Spring
	/cow
Average annual yield (litres)	5,000
Herd life (years)	5.0
Calving interval (days)	370
Cow size (kg)	500
Feed requirements (kg):	
Silage	5,500
Concentrates	750
Concentrates fed (kg/litre)	0.15
Overall forage area (ha):	
Silage & aftermath grazing	0.11
Grazing	0.33
Total	<u>0.44</u>

Basis of data:

1. A spring calving herd managed on a low input system. Calving between February and April. Maximum utilisation of grazed grass - 150 days winter feeding period.
2. A herd of 200 cows producing 1 million litres, assumed at 4.4% BF and 3.5% Protein.
3. The dry cow diet includes 165kg feeding straw (based on an inclusion of 3kg/hd/day over a 55 day dry period).
4. Calf sale/transfer value is an average of dairy heifers, males and beef cross calves at £164.75/hd then adjusted for calving interval and mortality. The calf value can be altered by £9.27 for each £10 difference in the sale/transfer price.
5. Cull cow sale price of £686.25/hd has been adjusted for herd life and mortality. The annual share can be altered by £1.95 for each £10 difference in cull cow price.
6. Heifer purchase/transfer price varies according to yield. A purchase price equating to 18ppl has been used. This has been adjusted for herd life and mortality. The annual share can be altered by £2.08 for each £10 difference in purchase/transfer price.

Dairy Cow - Spring Block Calving

GROSS MARGIN DATA

Calving period	Spring
	/cow
Average annual yield (litres)	5,000
OUTPUT	
Spring milk @ 41 p/litre	2,050
Calf value	153
Cull cow (annual share)	137
	<hr/>
	2,340
Heifer replacement (annual share)	187
	<hr/>
	2,153
VARIABLE COSTS	
Concentrates @ £315/t	236
AI	50
Vet & medicines	55
Other livestock expenses	100
	<hr/>
	441
Gross Margin before forage	<hr/>
	1,712
Forage variable costs:	
silage @ £607/ha	67
grazing @ £321/ha	106
Total Variable Costs	<hr/>
	614
GROSS MARGIN £/cow	<hr/>
	1,539
GROSS MARGIN £/forage ha	<hr/>
	3,498
Sensitivity-Change ±	Change in Gross Margin/head (£)
1 p/litre in milk price	50
£10/t in concentrate price	8

Dairy Cow – Moderate Input

PHYSICAL DATA

Calving period	All year
	/cow
Average annual yield (litres)	7,000
Herd life (years)	4.2
Calving interval (days)	380
Cow size (kg)	600
Feed requirements (kg):	
Silage	8,700
Concentrates	1,800
Concentrates fed (kg/litre)	0.26
Overall forage area (ha):	
Silage & aftermath grazing	0.17
Grazing	0.24
Total	<u>0.41</u>

Basis of data:

1. A moderate input system calving all year round; 200 days winter feeding period with cows at grass day and night during the grazing period.
2. A herd of 143 cows producing 1 million litres, assumed at 4.2% BF and 3.4% Protein.
3. The dry cow diet includes 115kg feeding straw (based on an inclusion of 3kg/hd/day over a 52 day dry period).
4. Calf sale/transfer value is an average of dairy heifers, males and beef cross calves at £166.00/hd then adjusted for calving interval and mortality. The calf value can be altered by £8.93 for each £10 difference in the sale/transfer price.
5. Cull cow sale price of £823.50/hd has been adjusted for herd life and mortality. The annual share can be altered by £2.34 for each £10 difference in cull cow price.
6. Heifer purchase/transfer price varies according to yield. A purchase price equating to 18ppl has been used. This has been adjusted for herd life and mortality. The annual share can be altered by £2.50 for each £10 difference in purchase/transfer price.

Dairy Cow – Moderate Input

GROSS MARGIN DATA

Calving period	All year /cow
Average annual yield (litres)	7,000
OUTPUT	
All year milk @ 41 p/litre	2,870
Calf value	148
Cull cow (annual share)	197
	<hr/>
	3,215
Heifer replacement (annual share)	314
	<hr/>
	2,901
VARIABLE COSTS	
Concentrates @ £315/t	567
AI	55
Vet & medicines	89
Other livestock expenses	100
	<hr/>
	811
Gross Margin before forage	<hr/>
	2,089
Forage variable costs:	
silage @ £607/ha	103
grazing @ £321/ha	77
Total Variable Costs	<hr/>
	991
GROSS MARGIN £/cow	<hr/>
	1,909
GROSS MARGIN £/forage ha	<hr/>
	4,657

Sensitivity-Change ±

1 p/litre in milk price
£10/t in concentrate price

Change in Gross Margin/head (£)

70
18

Dairy Cow – Moderate/High Output

PHYSICAL DATA

Calving period	All year
	/cow
Average annual yield (litres)	8,500
Herd life (years)	3.6
Calving interval (days)	390
Cow size (kg)	650
Feed requirements (kg):	
Silage	11,200
Concentrates	2,800
Concentrates fed (kg/litre)	0.33
Overall forage area (ha):	
Silage & aftermath grazing	0.22
Grazing	0.24
Total	<u>0.46</u>

Basis of data:

1. A moderate input system calving all year round; 230 days winter feeding period. During the grazing period cows are housed at night and grazed during the day.
2. A herd of 118 cows producing 1 million litres assumed at 4.1% BF and 3.3% Protein.
3. The dry cow diet includes 160kg feeding straw (based on an inclusion of 4kg/hd/day over a 51 day dry period).
4. Calf sale/transfer value is an average of dairy heifers, males and beef cross calves at £203/hd then adjusted for calving interval and mortality. The calf value can be altered by £8.70 for each £10 difference in the sale/transfer price.
5. Cull cow sale price of £785/hd has been adjusted for herd life and mortality. The annual share can be altered by £2.71 for each £10 difference in cull cow price.
6. Heifer purchase/transfer price varies according to yield. A purchase price equating to 18ppl has been used. This has been adjusted for herd life and mortality. The annual share can be altered by £2.94 for each £10 difference in purchase/transfer price.

Dairy Cow – Moderate/High Output

GROSS MARGIN DATA

Calving period	All year /cow
Average annual yield (litres)	8,500
OUTPUT	
All year milk @ 40 p/litre	3,400
Calf value	135
Cull cow (annual share)	220
	<hr/>
	3,755
Heifer replacement (annual share)	450
	<hr/>
	3,305
VARIABLE COSTS	
Concentrates @ £315/t	882
AI	65
Vet & medicines	108
Other livestock expenses	116
	<hr/>
	1,171
Gross Margin before forage	<hr/>
	2,134
Forage variable costs:	
silage @ £607/ha	134
grazing @ £321/ha	77
Total Variable Costs	<hr/>
	1,382
GROSS MARGIN £/cow	<hr/>
	1,923
GROSS MARGIN £/forage ha	<hr/>
	4,181
 Sensitivity-Change ±	
1 p/litre in milk price	Change in Gross Margin/head (£)
£10/t in concentrate price	85
	28

Dairy Cow - High Output

PHYSICAL DATA

Calving period	All year
	/cow
Average annual yield (litres)	10,000
Herd life (years)	3.0
Calving interval (days)	400
Cow size (kg)	650
Feed requirements (kg):	
Silage	12,600
Concentrates	3,800
Concentrates fed (kg/litre)	0.38
Overall forage area (ha):	
Silage & aftermath grazing	0.24
Grazing	0.00
Total	<u>0.24</u>

Basis of data:

1. A high input, high output system calving all year round and housed for 365 days on a complete winter ration (assumes no access to grass or zero grazing).
2. A herd of 100 cows producing 1 million litres assumed at 4.0% BF and 3.2% Protein.
3. The dry cow diet includes 245kg feeding straw (based on an inclusion of 5kg/hd/day over a 49 day dry period).
4. Calf sale/transfer value is an average of dairy heifers, males and beef cross calves at £213/hd then adjusted for calving interval and mortality. The calf value can be altered by £8.49 for each £10 difference in the sale/transfer price.
5. Cull cow sale price of £785.07/hd has been adjusted for herd life and mortality. The annual share can be altered by £3.11 for each £10 difference in cull cow price.
6. Heifer purchase/transfer price varies according to yield. A purchase price equating to 18ppl has been used. This has been adjusted for herd life and mortality. The annual share can be altered by £3.15 for each £10 difference in purchase/transfer price.

Dairy Cow - High Output

GROSS MARGIN DATA

Calving period	All year /cow
Average annual yield (litres)	10,000
OUTPUT	
All year milk @ 40 p/litre	4,000
Calf value	172
Cull cow (annual share)	262
	<hr/>
	4,434
Heifer replacement (annual share)	567
	<hr/>
	3,867
VARIABLE COSTS	
Concentrates @ £315/t	1,197
AI	71
Vet & medicines	127
Other livestock expenses	132
	<hr/>
	1,527
Gross Margin before forage	<hr/>
	2,340
Forage variable costs:	
silage @ £607/ha	146
grazing @ £321/ha	-
Total Variable Costs	<hr/>
	1,673
GROSS MARGIN £/cow	<hr/>
	2,194
GROSS MARGIN £/forage ha	<hr/>
	9,142
 Sensitivity-Change ±	
1 p/litre in milk price	Change in Gross Margin/head (£) 100
£10/t in concentrate price	38

Replacement Heifer Rearing

Fodder requirements of Holstein Friesian heifers

The following tables provide forage data to budget for the cost of replacement heifers. Also see pages 142-143.

		Approx. closing lwt (kg)	Heifer grazing (days)	Mainly silage ration		
				Conc (kg)	Straw (kg)	Silage (kg)
Early autumn						
(1st Sept)/24 months						
Birth		40	-	-	-	-
0-3	S-N	110	-	140	45	-
4-8	D-A	220	-	410	135	800
9-14	My-O	355	123	125	-	1,160
15-20	N-A	490	-	275	-	4,290
21-24	My-A	585	102	42	85	440
Total			<u>225</u>	<u>992</u>	<u>265</u>	<u>6,690</u>
Forage (ha)			0.21	-	-	0.13
Early spring						
(1st April)/24 months						
Birth		40	-	-	-	-
0-3	A-J	110	-	140	45	-
4-8	J-N	220	-	415	140	800
9-14	D-My	355	-	275	-	3,150
15-20	J-N	490	61	185	-	2,890
21-24	D-M	585	-	205	170	2,910
Total			<u>61</u>	<u>1,220</u>	<u>355</u>	<u>9,750</u>
Forage (ha)			0.06	-	-	0.19

		Approx. closing lwt (kg)	Heifer grazing (days)	Mainly silage ration		
				Conc (kg)	Straw (kg)	Silage (kg)
Early autumn						
(1st Sept)/27 months						
Birth		40	-	-	-	-
0-3	S-N	100	-	170	45	-
4-8	D-A	205	-	330	180	820
9-14	My-O	335	153	47	-	560
15-20	N-A	455	-	275	-	4,100
21-27	My-N	600	153	60	185	1,735
Total		-	<u>306</u>	<u>882</u>	<u>410</u>	<u>7,215</u>
Forage (ha)			0.29	-	-	0.18
Early spring						
(1st April)/27 months						
Birth		40	-	-	-	-
0-3	A-J	100	-	170	45	-
4-8	J-N	205	-	335	185	820
9-14	D-My	335	50	200	-	1,980
15-20	J-N	455	122	60	-	1,630
21-27	D-M	600	60	155	63	4,565
Total		-	<u>232</u>	<u>920</u>	<u>293</u>	<u>8,995</u>
Forage (ha)			0.23	-	-	0.22

Replacement Heifer Rearing

PHYSICAL DATA

Time of birth	Early autumn	Early spring	Early autumn	Early spring
Age at calving	24 months	24 months	27 months	27 months
Ration type	Mainly silage	Mainly silage	Mainly silage	Mainly silage
Milk, whole	litre 0	0	0	0
Milk, substitute	kg 45	45	45	45
Concentrates:				
starter (proprietary)	kg 90	90	110	110
rearer	kg 360	360	325	325
cereal mix	kg 542	770	447	485
straw	kg 265	355	410	293
Forage: silage	kg 6,690	9,750	7,215	8,895
silage	ha 0.13	0.19	0.18	0.22
grazing	ha 0.21	0.06	0.29	0.23
Total forage	ha 0.34	0.25	0.47	0.45
<i>Basis of data:</i>				
(a) Quality of forage:	ME (MJ/kg DM)	DM (g/kg)	'Substitution Rate'	
Silage - 24m calving	11.0	300	3 - 3.5	
Silage - 27m calving	10.5	300	3 - 3.5	
Straw	6.3	850	1	

- (b) The forage hectares shown are derived from the Grassland section for silage (310 kgN, 3 cuts for heifers calving at 24 months; 220 kgN, 2 cuts for heifers calving at 27 months and grazing (175 kgN). The hectares for silage include a proportion of aftermath grazing, which in turn has been deducted from the grazing requirement.
- (c) Intensification of grazing can save up to 25% of the area allocated.

Replacement Heifer Rearing

GROSS MARGIN DATA

Time of birth	Early autumn	Early spring	Early autumn	Early spring
Age at calving	24 months	24 months	27 months	27 months
Ration type	Mainly silage	Mainly silage	Mainly silage	Mainly silage
OUTPUT - Heifer at calving	1,480	1,480	1,480	1,480
Less heifer calf	163	163	163	163
	<u>1,317</u>	<u>1,317</u>	<u>1,317</u>	<u>1,317</u>
VARIABLE COSTS				
Milk, whole @ 40.5 p/litre	0	0	0	0
Milk, substitute @ £2200/t	99	99	99	99
Concentrates starters @ £360/t	32	32	40	40
rearing @ £330/t	119	119	107	107
mainly cereal mix @ £260/t	141	200	116	126
straw @ £100/t	27	36	41	29
Vet & medicines	47	47	47	47
AI & other livestock expenses	74	74	74	74
	<u>539</u>	<u>607</u>	<u>524</u>	<u>522</u>
	<u>779</u>	<u>711</u>	<u>794</u>	<u>796</u>
Gross margin before forage				
Forage variable costs:				
silage @ £607/ha, silage @ £486/ha,	79	115	88	108
grazing @ £233/ha	49	14	68	54
	<u>667</u>	<u>736</u>	<u>680</u>	<u>684</u>
Total Variable costs	<u>651</u>	<u>582</u>	<u>638</u>	<u>634</u>
GROSS MARGIN (birth to calving)	1,913 (774)	2,326 (941)	1,355 (548)	1,400 (567)

GROSS MARGIN/forage ha (acre)

Note: The calf price of £200 and value of heifer sold of £1600 have been adjusted to allow for mortality (5-10%) and barren and reject heifers (5-10%) respectively.

Contract Dairy Heifer Rearing

Contract rearing dairy heifers by a dedicated rearer allows the farmer to focus purely on the milking herd and reduces time and resources previously allocated to youngstock.

As achieving target body weight at different stages throughout the rearing process is the basis of efficient heifer rearing programmes, contracts are often based on certain targets being met, such as growth rate, age at first service and age at first calving. The aim should be for heifers calving at 22-24 months to reach 85-90% of mature body weight at calving.

Contract rearers tend to take delivery of heifers from between 2 to 4 months of age, returning them to the dairy farmer at 4 to 6 weeks before calving.

There are various types of contract:

- *Contract payment based on per animal per day.* This is where the farmer pays a flat rate fee per head per day based on the actual rearing costs.
- *Weight gain on a per kilogram basis contract.* The difference between the delivery weight to the rearer and the return weight to the farmer is divided by the number of days to determine the growth rate per day. The danger with this type of contract is that the rearer must avoid producing heifers that are over-conditioned.
- *Sell and buy-back contract.* The rearer buys the calves at an agreed price, with the farmer retaining the right to buy back the heifers 4 to 6 weeks prior to calving. The rearer retains control of the system but is responsible for all costs and losses incurred. The farmer runs the risk of buying back heifers at an age or weight that is not desirable in their system.
- *Labour and facilities only contract.* A contract where the farmer stipulates the rearing policy and covers all costs such as feed, semen, veterinary medicines, and transport costs (as well as any losses). The rearer only provides the labour and facilities.

Care must be taken to ensure that both the rearer and the dairy farmer's responsibilities are clearly defined, including performance targets and who covers what costs. The rearer should have insurance to cover any third-party claims involving the heifers in his care.

A summary of charges is given below. These are based on the rearer paying all costs associated with the heifers in their care, excluding transport.

	Charge	
	£/day	£/month
From 14 days to 3 months of age	1.88	56.50
From 3 months to pre-calving (at 22 months of age)	2.18	65.40

These are based on the requirements for a spring born heifer calving at 24 months.

Beef Cattle

Introduction

Markets and price drivers

The dynamic of the UK beef herd is altering, with BCMS cattle population data showing, annual decreases in the suckler breeding herd, however, it shows growth in production of beef from the dairy. Data from December 2023 shows the UK beef herd at 1.33 million head, a decrease of 4.4% since 2022. The dairy herd is also decreasing at 1.84 million head, a decrease of 0.5% since 2022. In 2023, there was a year-on-year decrease of beef sired calves registered by 66,100 head (2.5%), which is the largest decrease in five years. It is noticeable in this data, that beef sired calves being registered from dairy dams has increased.

The reduction in the national herd has largely happened due to low profitability in beef enterprises, due to high production costs. These have come around due to volatility of global markets due to world conflict and extreme weather events making inputs at a premium price. In addition, the cull beef price has been at a premium, which has allowed many producers to look at the efficiency of individual animals, which has resulted in culls of older and non-efficient animals.

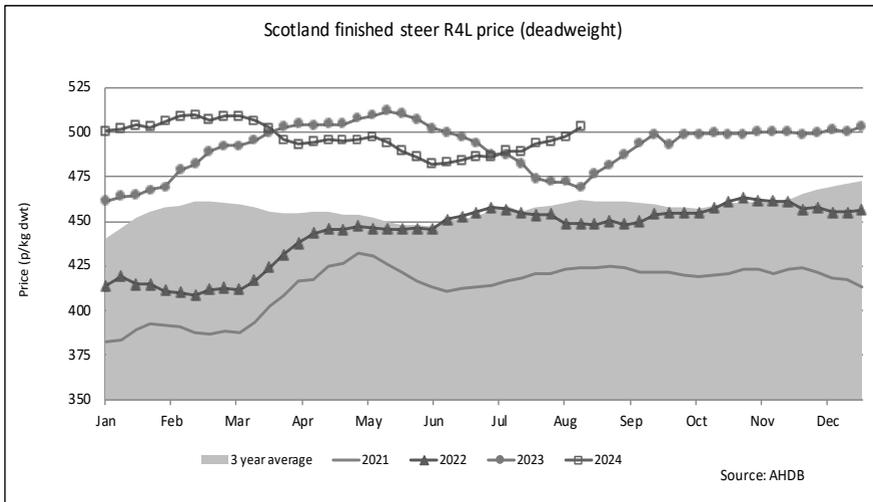
The beef price is largely dictated by domestic and global demand, supply and the price point, and how competitive our product is against other countries.

With this in mind, Scottish prices fluctuated through 2023. Prices were at a high level of 515-520p/kg in late spring / early summer 2023 then fell to a low of 460-470p/kg during August. Carcase weights fell in the first quarter of the year - a reflection on the dry weather and inflated feed and fertiliser costs. The increasing influence of dairy beef bred animals – registrations for beef calves out of the dairy herd have increased by 1.7% - will contribute to lower weights and cattle killing out lighter. To illustrate the rise of dairy beef, registrations of these calves has increased 77% in the last 10 years. In the prime market (12-30 months old), dairy beef cattle contributed to 35% of the slaughter in 2023; this accounted for 28% in 2019. The majority of Scottish processing capacity is now controlled by Irish companies.

The UK is still heavily reliant on imports of beef, particularly from Ireland. However, imports from Australia and New Zealand have also risen during 2023. The Irish and UK have aligned closer together, making our price competitive. The volume of beef imported to the UK has a major effect on the UK price. The UK also exports beef and has seen increasing levels to countries such as Hong Kong, Canada and the Philippines.

Volatility and lack of certainty impacts producer confidence especially considering beef production's long lead-time. Meeting carcase specification of the intended market is essential, and a short finishing period is likely to be most cost effective. Carcase balance issues also influence the producer price, for example, demand for higher value

steaks over the BBQ season can lift whole carcass value. Beef demand is equally sensitive to inflation, the competitiveness of beef imports and alternative proteins such as chicken.



In 2023, cull cow slaughter prices started ahead of 2022 levels, with an increase in demand for mince and a global shortage of manufacturing beef, the cull cow trade reached unprecedented levels. Many markets reported cull cow trade exceeding £2,500/head. Cow prices in 2024 have returned to more normal levels relative to prime cattle prices.

With few exceptions, beef is traded on the commodity spot market and therefore most producers cannot use forward contracts or other price levelling mechanisms as a risk management tool. There is now a great deal of interest in shortening supply chains and dealing with or close to the end consumer. While the whole beef industry can't do this, there are opportunities for some businesses to deal directly with their consumer and ensure both profitability and business resilience.

Marketing

The vast majority of prime cattle marketed in Scotland are marketed direct to the slaughterhouse and sold deadweight. However, a large proportion will be traded at some stage in their lives through the auction system. The live cattle auction provides a valued service, bringing many buyers and sellers together and creating genuine, healthy competition to buy livestock.

While some farmers sell all their cattle on one day, many seek to spread their risk by targeting several large sales per year. Price can be influenced by gaining feedback from buyers and selling the right type of cattle at the appropriate sales. Similarly, when selling direct to processors, a higher price might be achievable if a large number of in-

specification cattle can be delivered at pre-arranged times and/or agreed to be spread throughout the year.

Margins

The bottom-line contribution of cattle is highly sensitive to the sales price. With the current market system, farmers have very limited options to influence the price they receive. For most farmers, efficiency savings are the key to improving financial performance. Efficiency savings also bring about a reduction to the carbon footprint for individual farm businesses.

The most profitable suckler cow enterprises make a positive net margin before subsidy. Top performing suckler beef systems tend to rear more calves per cow, to heavier weights, using less purchased feed. To achieve this, grassland management is key. Furthermore, while fixed costs may be lower, they are also diluted by selling more kilos of beef. The best farmers target investment in infrastructure and equipment towards things that lead to cost savings.

Suckler cow margins were under pressure going into the 2022/23 winter with high fertiliser and feed costs. From early 2023 onwards, the prices paid for store cattle rose to a point where many sales averaged over 300p/kg. This increase in output will have helped the margins on many suckler enterprises.

The high cull cow price resulted in large numbers of cows being culled. Scotland now has less than 400,000 suckler cows, sitting at 394,709, which is a fall of 3.5% in the year.

This contraction of the breeding herd will continue to have ramifications for both store cattle availability and the supply of finished cattle to maintain critical mass in the country. Numbers look to tighten in the autumn as the reduced 2023 spring calf crop starts to dominate slaughtering. Finisher's margins have been under pressure this year, with prices behind 2023 levels. The high price of store cattle has reduced any possible improvement in the margin.

Other benefits

It is important to remember that the cows form part of a business. How the enterprise complements other parts of the business is also important. For example, the share and spread of demand for labour and machinery will affect the success of the enterprise mix in a business. Furthermore, well managed multiple enterprises can spread risk and improve cash flow, having additional and multiple sale dates.

Suckler cows play a vital role in managing upland grazings, providing benefit to biodiversity, landscape management and grazing quality. Mixed livestock grazing systems also contribute to reduced worm burdens for both cattle and sheep. Their manure is also an important source of nutrients for arable cropping as part of a crop rotation. Consequently, any enterprise should not be viewed in isolation.

Subsidies and support

The Scottish Suckler Beef Support Scheme (SSBSS), commenced in 2015. Payment is made on male and female calves, which are at least 75% beef bred, born on your holding and have been kept there for at least 30 days. For the 2023 Scheme year, the net payment rate per eligible calf on the mainland was £105.24 and £151.24 on the islands. Actual payment rates are determined by the number of calves claimed each year and the exchange rate for that year. In 2023, there were 76 fewer claims than in 2022, and 4% fewer calves, making the payment rate per calf increase. Payments are confirmed once applications are validated in the spring following the year of claim. From 2025 onwards, calves will only be eligible for a SSBSS payment if their dam has a calving interval of 410 days or less. Heifers' calves will be eligible provided they meet the other conditions of the scheme as for first calvers, no calving interval is established.

For further details on payments and the requirements of the SSBSS see pages 474 in the Rural Aid Schemes section.

General Reference Data

Store cattle valuations

The sale value of store cattle can vary depending on time of sale. This variation has been removed for the gross margins.

The age and weight of calves at sale varies depending on season or month of calving - *be cautious when comparing spring and autumn calving herds.*

Note that an increasing share of fixed costs are attributable as the length of time trading stock spend on farm increases – this is true where other breeding or trading stock could have made use of the farm resources.

Foster calves

To reduce risk of disease, it is assumed that no foster calves are bought to replace dead calves. No cost for replacement calves has been included in the margins thus, if foster calves are bought, the appropriate adjustment should be made to the gross margin.

Liveweight to deadweight-price conversion

In order to calculate the deadweight price, divide the liveweight price by the killing out percentage (KO %). For example: $200 \text{ p/kg} / 0.52 = 385 \text{ p/kg deadweight.}$

See quick reference table overleaf:

Liveweight Price (p/kg)	Killing out %					
	50%	52%	54%	56%	58%	60%
	Deadweight price (p/kg)					
200	400	385	370	357	345	333
202	404	388	374	361	348	337
204	408	392	378	364	352	340
206	412	396	381	368	355	343
208	416	400	385	371	359	347
210	420	404	389	375	362	350
212	424	408	393	379	366	353
214	428	412	396	382	369	357
216	432	415	400	386	372	360
218	436	419	404	389	376	363
220	440	423	407	393	379	367
222	444	427	411	396	383	370
224	448	431	415	400	386	373
226	452	435	419	404	390	377
228	456	438	422	407	393	380
230	460	442	426	411	397	383
232	464	446	430	414	400	387
234	468	450	433	418	403	390
236	472	454	437	421	407	393
238	476	458	441	425	410	397
240	480	462	444	429	414	400
242	484	465	448	432	417	403
244	488	469	452	436	421	407
246	492	473	456	439	424	410
248	496	477	459	443	428	413
250	500	481	463	446	431	417

Hill Suckler Cows

PHYSICAL DATA

	Spring Feb-Apr	Autumn Sep-Nov
Calving period		
Calves weaned per 100 cows put to the bull	90%	90%
Month of weaning	October	July
Days to weaning	220	270
Month of sale	October	October
Lwt of calves: at weaning (kg)	235	270
Lwt of calves: at sale/transfer (kg)	235	335
Herd life of cows (years)	7	7
Herd life of bulls (years)	4	4
Cow mortality (%)	1	1
Calf mortality (%)	4.5	4.5
Cow:bull ratio (:1)	35	35
Feeding/cow and calf (winter days):	210	210
silage (t)	5.5	7.5
straw (kg)	-	-
creep feed (kg) (incl. pre sale)	-	250
cow concentrates (kg)	50	200
cow cobs (kg)	50	50
grazing (hill/rough pasture)	>0.5	>0.6
Silage fertiliser (kg N/ha)	125	125
Silage:		
yield (t/ha from 1-cut)	20	20
DM quality (g/kg)	300	300
ME quality (MJ/kg DM)	10	10
Rough grazing (ha)	>0.6	>0.5
Silage & aftermath grazing (ha)	0.28	0.375
Housing system:		
Straw for general use incl. calving pens	0.33	0.42
Straw bedding (if in bedded courts) (t)	1.25	1.50

Based on bought-in straw.

* Amend bedding costs for cows outwintered or housed on straw.

Assumptions:

1. Grazing is assumed to be hill grazing with some improvements, carrying a maintenance charge of £50/grazing livestock unit.
2. SSBSS value is based on mainland payments, adjusted for living calves at 30 days of age. For further detail on this scheme see pages 151 and 474.

Hill Suckler Cows

GROSS MARGIN DATA

	Spring	Autumn
Calving period	Feb-Apr	Sep-Nov
OUTPUT	£/cow	£/cow
Calf sales (lwt)		
Steers		
350 kg @ 300 p	-	905
250 kg @ 300 p	635	-
Heifers		
320 kg @ 300 p		
220 kg @ 300 p		
Scottish Suckler Beef Support Scheme	97	97
	732	1002
Less: Replacement - cow	26	26
bull	26	26
	680	950
VARIABLE COSTS		
Cow concentrates @ £274/t	14	55
Cow cobs @ £326/t	16	16
Creep feed @ £260/t	-	65
Vet & medicines	37	37
Straw bedding @ £125/t (bought-in)	41	53
Commission, haulage & tags	49	60
	157	286
Gross Margin before forage	523	664
Forage variable costs:		
silage @ £207/ha	57	78
grazing @ £10/grazing livestock unit	11	15
	68	93
Total Variable Costs	225	379
GROSS MARGIN £/cow	455	571

Sensitivity-Change ±

10 p/kg in lwt sale price	
Sale weight ± 10kg	
Herd life ± 1 year	

Change in Gross Margin/head (£)

21	30
27	27
12	12

Replacement Cost prices:

Cull cow	£1,150	In-calf heifer (purch.)	£1,250
Cull bull	£1,400	Replacement bull	£5,000

Upland Suckler Cows - Mainly Silage Diets

PHYSICAL DATA

Breed: Commercial cows bred to a range of bulls, mostly continental.

Calving period	Feb-Apr	May-Jun	Aug-Oct
Calves weaned	92%	92%	92%
Month of weaning	October	December	July
Days to weaning	220	200	300
Month of sale	October	April	October
Lwt of calves: at weaning (kg)	275	260	330
Lwt of calves: at sale/transfer (kg)	275	350	400
Herd life of cows (years)	7	7	7
Herd life of bulls (years)	4	4	4
Cow mortality (%)	1	1	1
Calf mortality (%)	4.5	4.5	4.5
Cow:bull ratio (:1)	35	35	35
Feeding/cow and calf (winter days):	180	180	200
silage (t)	4.8	6.9	7.5
straw (t)	0.3	0.2	0.35
calf concentrates (kg)	100	280	365
cow concentrates (kg)	100	150	200
Grazing fertiliser (kg N/ha)	125	125	125
Silage & aftermath fertiliser (kgN/ha)	200	200	200
Silage:			
yield (t/ha from 1-cut)	23	23	23
DM quality (g/kg)	300	300	300
ME quality (MJ/kg DM)	10.5	10.5	10.5
Overall forage area (ha):			
silage and aftermath grazing	0.24	0.25	0.38
grazing	0.30	0.30	0.34
	<u>0.54</u>	<u>0.55</u>	<u>0.72</u>

Housing system: In cubicles*

Straw for general use incl. calving pens	0.33	0.33	0.42
Straw bedding (if in bedded courts) (t)	1.25	1.75	1.50

Based on bought-in straw, adjust if home-grown.

* Amend bedding costs for cows overwintered or housed on straw.

Assumptions:

1. Mainly grass farm either buying in all straw and concentrates or growing small amount of cereals. May/June calves weaned in February when on silage diets.
2. SSBSS value is based on mainland payments, adjusted for living calves at 30 days of age. For further detail on this scheme see pages 151 and 474.

Upland Suckler Cows - Mainly Silage Diets

GROSS MARGIN DATA

Calving period	Feb-Apr	May-Jun	Aug-Oct
OUTPUT	£/cow	£/cow	£/cow
Calf sales (lwt - 92% crop)			
Steers			
290 kg @ 300 p	759	-	-
370 kg @ 300 p	-	966	-
420 kg @ 300 p	-	-	1104
Heifers			
330 kg @ 300 p			
380 kg @ 300 p			
Scottish Suckler Beef Support Scheme	99	99	99
	<hr/>	<hr/>	<hr/>
	858	1065	1203
Less: Replacement -			
cow	41	41	41
bull	32	32	32
	<hr/>	<hr/>	<hr/>
	785	992	1130
VARIABLE COSTS			
Cow concentrates @ £274/t	27	41	55
Calf concentrates @ £260/t	26	73	95
Vet & medicines	39	39	39
Feeding straw @ £125/t (bought-in)	38	25	44
Bedding straw @ £125/t (bought-in)	41	41	53
Commission, haulage, tags & levies	54	63	68
	<hr/>	<hr/>	<hr/>
	225	282	354
Gross Margin before forage	<hr/>	<hr/>	<hr/>
	560	710	776
Forage variable costs:			
silage @ £207/ha	50	52	79
grazing @ £177/ha	53	53	60
	<hr/>	<hr/>	<hr/>
	103	105	139
Total Variable Costs	<hr/>	<hr/>	<hr/>
	328	387	493
GROSS MARGIN £/cow	<hr/>	<hr/>	<hr/>
	457	605	637
GROSS MARGIN £/ha	<hr/>	<hr/>	<hr/>
	846	1099	884

Sensitivity-Change ±

	Change in Gross Margin/head (£)		
10 p/kg in lwt sale price	25	32	37
Sale weight ± 10kg	28	28	28
Herd life ± 1 year	16	16	16

Replacement cost prices:

Cull cow	£1,360	In-calf heifer (purch.)	£1,550
Cull bull	£1,575	Replacement bull	£6,000

Suckler Cows - Mainly Straw Diets

PHYSICAL DATA

Breed: Dairy-beef cross cows bred to range of bulls, mostly continental.

Calving period	Feb-Apr	May-Jun	Aug-Oct
Calves weaned (%)	92%	92%	92%
Month of weaning	October	December	July
Days to weaning	220	200	300
Month of sale	October	April	October
Lwt of calves: at weaning (kg)	275	260	330
Lwt of calves: at sale/transfer (kg)	275	350	400
Herd life of cows (years)	7	7	7
Herd life of bulls (years)	4	4	4
Cow mortality (%)	1	1	1
Calf mortality (%)	4.5	4.5	4.5
Cow:bull ratio (:1)	35	35	35
Feeding/cow and calf (winter days):	180	180	200
silage (t)	1.5	-	-
straw (t)	1.5	2.2	1.3
calf concentrates (kg)	100	330	415
cow concentrates (kg)	600	550	1,500
Grazing fertiliser (kg N/ha)	125	125	125
Silage & aftermath fertiliser (kg N/ha)	175	-	-
Silage:			
yield (t/ha from 1-cut)	23	23	23
DM quality (g/kg)	300	300	300
ME quality (MJ/kg DM)	10.5	10.5	10.5
Overall forage area (ha):			
silage and aftermath grazing	0.07	-	-
grazing	0.34	0.38	0.40
	<u>0.41</u>	<u>0.38</u>	<u>0.40</u>

Housing system: Straw bedding assumed*

Straw bedding (t)	0.75	1.05	0.90
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Based on home-grown straw, adjust if bought-in.

* Amend bedding costs for cows outwintered or housed elsewhere.

Assumptions:

1. Mixed farm growing sufficient grain to cover concentrate and straw feeding/bedding requirements. Only purchasing protein and minerals. May/June calves weaned earlier to reduce cow wintering costs. Small amount of silage made to cover extra grass growth in early season.
2. SSBSS value is based on mainland payments, adjusted for living calves at 30 days of age. For further detail on this scheme see pages 151 and 474.

Suckler Cows - Mainly Straw Diets

GROSS MARGIN DATA

Calving period	Feb-Apr	May-Jun	Aug-Oct
OUTPUT	£/cow	£/cow	£/cow
Calf sales (lwt - 92% crop)			
Steers			
290 kg @ 300 p	759	-	-
370 kg @ 300 p	-	966	-
420 kg @ 300 p	-	-	1090
Heifers			
260 kg @ 300 p			
330 kg @ 300 p			
370 kg @ 300 p			
Scottish Suckler Beef Support Scheme	99	99	99
	<u>858</u>	<u>1065</u>	<u>1189</u>
Less: Replacement - cow	41	41	41
bull	32	32	32
	<u>785</u>	<u>992</u>	<u>1116</u>
VARIABLE COSTS			
Cow concentrates @ £304/t (home-mix)	182	167	456
Calf concentrates @ £416/t (home-mix)	42	137	173
Feeding straw @ £100/t (home-grown)	150	220	130
Bedding straw @ £100/t (home-grown)	75	105	90
Vet & medicines	39	39	39
Commission, haulage & tags	54	63	68
	<u>542</u>	<u>731</u>	<u>956</u>
Gross Margin before forage	<u>243</u>	<u>261</u>	<u>160</u>
Forage variable costs:			
silage @ £207/ha	14	-	-
grazing @ £233/ha	79	89	93
	<u>93</u>	<u>89</u>	<u>93</u>
Total Variable Costs	<u>635</u>	<u>820</u>	<u>1049</u>
GROSS MARGIN £/cow	<u>150</u>	<u>172</u>	<u>67</u>
GROSS MARGIN £/ha	<u>369</u>	<u>452</u>	<u>167</u>

Sensitivity-Change ±

	Change in Gross Margin/head (£)		
10 p/kg in lwt sale price	25	32	37
Sale weight ± 10kg	28	28	28
Herd life ± 1 year	16	16	16

Replacement cost prices:

Cull cow	£1,360	In-calf heifer (purch.)	£1,550
Cull bull	£1,575	Replacement bull	£6,000

Spring Calving Cows Producing 18 - 20 Month Finished Cattle

PHYSICAL DATA

Breed: Commercial cows bred to a range of bulls, mostly continental

	Steers	Heifers
Calving period	Feb-Apr	Feb-Apr
Calves weaned (%)	92%	92%
Month of weaning	October	October
Calves sold finished (%)	91%	91%
Sale weight (kg lwt)	650	600
Dead weight (kg dwt)	365	340
Weaning weight (kg lwt)	290	260
Herd life of cows (years)	7	7
Herd life of bulls (years)	4	4
Cow:bull ratio (:1)	35	35
Feeding/cow and calf (winter days):	180	180
silage (t)	5.0	5.0
straw bedding (t)	2.0	2.0
calf concentrates (kg) pre-weaning	100	100
cow concentrates (kg)	100	100
Forage area (ha):		
silage + aftermath	0.16	0.16
grazing	0.30	0.30
Overwintered calves:		
Feeding period 180 days, October-April		
Liveweight gain (kg)	144	144
Average daily liveweight gain (kg)	0.8	0.8
Feeding: barley/protein/minerals (t)	0.42	0.35
silage (t)	3.5	3.0
Silage area (ha)	0.11	0.10
Finishing cattle:		
Feeding period (days): at grass	145	145
housed	60	60
Liveweight gain	216	196
Daily liveweight gain: at grass	1	0.9
housed	1.2	1.1
Feeding: concentrates at grass (t)	0.20	0.25
barley/protein/minerals in house (t)	0.70	0.70
straw fed in house (t)	0.1	0.1
Grazing area (ha)	0.23	0.20

Housing system: Straw bedding assumed, home-grown*

* Amend bedding costs for cows overwintered or on slurry systems.

Assumption: SSBSS value as per note on page 158.

Spring Calving Cows Producing 18 - 20 Month Finished Cattle

GROSS MARGIN DATA

	Spring born	
	Steer £/cow	Heifer £/cow
OUTPUT		
Calf sales (dwt - 91% crop)		
365 kg @ 485 p	1,611	-
340 kg @ 485 p	-	1,501
Scottish Suckler Beef Support Scheme	98	98
	<u>1,709</u>	<u>1,599</u>
Less: Replacement - cow	41	41
bull	32	32
	<u>1,636</u>	<u>1,526</u>
VARIABLE COSTS		
Cow concentrates @ £274/t	27	27
Calf concentrates @ £260/t	26	26
Barley, protein & minerals @ £250/t housed	280	263
Barley, protein & minerals @ £250/t at grass	50	63
Feeding straw @ £100/t (home-grown)	10	10
Bedding straw @ £100/t (home-grown)	200	200
Vet & medicines	78	78
Commission, levies & haulage	106	102
	<u>777</u>	<u>769</u>
Gross Margin before forage	<u>859</u>	<u>757</u>
Forage variable costs:		
silage @ £317/ha	86	82
grazing @ £177/ha	94	89
	<u>180</u>	<u>171</u>
Total Variable Costs	<u>957</u>	<u>940</u>
GROSS MARGIN £/cow	<u>679</u>	<u>586</u>
GROSS MARGIN £/ha (acre)	<u>849</u> (344)	<u>771</u> (312)

Sensitivity-Change ±

10 p/kg in dwt sale price	
Not bedded on straw	
£10/t in straw price	

Change in Gross Margin/head (£)

33	31
200	200
21	21

Replacement cost prices:

Cull cow	£1,360	In-calf heifer (purch.)	£1,550
Cull bull	£1,575	Replacement bull	£6,000

Overwintering Spring-Born Suckled Calves

PHYSICAL DATA

	Spring-born		Spring-born		
	Steer		Heifer		
Purchase/transfer date	October		October		
Sale/transfer date	April		April		
Feeding period (days)	180		180		
Liveweight: at purchase/transfer (kg)	290		260		
at sale/transfer (kg)	420		386		
Average daily liveweight gain (kg/day)	0.7		0.7		
Mortality (%)	1		1		
Feeding:	diet basis	silage	straw	silage	straw
	barley/protein/minerals (t)	0.30	0.75	0.25	0.75
	silage (t)	3.5	-	3.0	-
	straw (t) ME 6.5 MJ/kg DM	-	0.8	-	0.8
Silage area (ha)	0.11	-	0.10	-	
Silage: yield (t/ha)	31	31	31	31	
DM quality (g/kg)	300	300	300	300	
ME quality (MJ/kg DM)	10.6	10.6	10.6	10.6	
N-fertiliser (kg/ha)	220	220	220	220	
Housing system: Straw bedding assumed*.					
Straw bedding (t)	0.5	0.3	0.5	0.3	
Cost @ £100/t based on home grown straw - adjust if bought in.					
* Amend bedding costs if outwintered or on slurry systems.					

Assumptions:

1. Silage diet concentrates phased out by 4 weeks to turnout.
2. Silage could be costed on a per tonne basis for clamp silage instead of a per hectare basis to reflect the true cost of growing, making, storing and handling silage.

Overwintering Spring-Born Suckled Calves

GROSS MARGIN DATA

OUTPUT	Spring-born			
	Steer £/head		Heifer £/head	
Sale value (lwt - 1% mortality):				
420 kg @ 300 p	1247		-	
386 kg @ 300 p	-		1146	
Less: Weaned calf (lwt):				
290 kg @ 300 p	870		-	
260 kg @ 300 p	-		780	
	<u>377</u>		<u>366</u>	
VARIABLE COSTS				
<i>Diet basis</i>	<i>silage</i>	<i>straw</i>	<i>silage</i>	<i>straw</i>
Barley, protein & minerals @ £250/t	75	-	63	-
Barley, protein & minerals @ £250/t	-	188	-	188
Feeding straw @ £100/t (home-grown)	-	80	-	80
Bedding straw @ £100/t (home-grown)	50	30	50	30
Vet & medicines	34	34	34	34
Commission, levies & haulage	61	61	57	57
	<u>220</u>	<u>393</u>	<u>204</u>	<u>389</u>
Gross Margin before forage	<u>157</u>	<u>- 16</u>	<u>162</u>	<u>- 23</u>
Forage variable costs:				
silage @ £317/ha	35	-	32	-
Total Variable Costs	<u>255</u>	<u>393</u>	<u>235</u>	<u>389</u>
GROSS MARGIN £/head	<u>122</u>	<u>- 16</u>	<u>131</u>	<u>- 23</u>
GROSS MARGIN £/ha (acre)	<u>1,112</u> (450)	<u>-</u>	<u>1,305</u> (528)	<u>-</u>
Sensitivity-Change ±				
	Change in Gross Margin/head (£)			
10 p/kg in lwt sale price	42	42	39	39
10 p/kg in lwt purchase price	29	29	26	26
Not bedded on straw	50	30	50	30
£10/t in straw price	5	11	5	11

Finishing Spring-Born Suckled Calves Intensively at 13 Months

PHYSICAL DATA

	Spring-born	
	Steer	Bull
Purchase/transfer date	October	October
Sale date	June	May
Feeding period (days)	247	225
Liveweight: at purchase/transfer (kg lwt)	290	300
at sale (kg lwt)	612	630
Deadweight at sale (kg dwt)	337	353
Average daily liveweight gain (kg/day)	1.30	1.47
Mortality (%)	1	1
Feeding:		
barley/protein/minerals (t)	2.4	2.5
straw (t) ME 6.5 MJ/kg DM	0.3	0.3
Housing system: Straw bedding assumed*.		
Straw bedding (t)	0.50	0.45

Based on home-grown straw, adjust if bought-in.

* Amend bedding costs if on slurry based systems.

Finishing Spring-Born Suckled Calves Intensively at 13 Months

GROSS MARGIN DATA

OUTPUT	Steer £/head	Bull £/head
Sale value (dwt - 1% mortality):		
337 kg @ 485 p (612 kg lwt)	1,616	-
353 kg @ 475 p (630 kg lwt)	-	1,659
Less: Store purchase (lwt):		
290 kg @ 300 p	870	-
300 kg @ 270 p	-	810
	<u>746</u>	<u>849</u>
VARIABLE COSTS		
Barley, protein & minerals @ £260/t	624	650
Feeding straw @ £100/t (home-grown)	30	30
Bedding straw @ £100/t (home-grown)	50	45
Vet & medicines	34	34
Commission, levies & haulage	73	74
Total Variable Costs	<u>811</u>	<u>833</u>
GROSS MARGIN £/head	<u>-65</u>	<u>16</u>

Sensitivity-Change ±	Change in Gross Margin/head (£)	
10 p/kg in dwt sale price	34	35
10 p/kg in lwt purchase price	29	30
Not bedded on straw	50	45
£10/t in straw price	8	8

Finishing Year Old Autumn-Born Suckled Calves at 18 Months

PHYSICAL DATA

	Autumn-born	
	Steer	Heifer
Purchase/transfer date	October	October
Sale date	April	April
Feeding period (days)	180	180
Liveweight: at purchase/transfer (kg lwt)	420	380
Liveweight: at sale (kg lwt)	650	600
Deadweight at sale (kg dwt)	360	340
Average daily liveweight gain (kg/day)	1.3	1.2
Mortality (%)	1	1
Feeding:		
barley/protein/minerals (t)	0.96	0.67
kg/day	3.9	3.7
silage (t)	4.5	4.5
kg/day	25.1	25.1
Silage area (ha)	0.15	0.15
Silage: yield	31	31
DM quality (g/kg)	300	300
ME quality (MJ/kg DM)	10.6	10.6
Silage fertiliser (kg N/ha)	220	220
Housing system: Straw bedding assumed*.		
Straw bedding (t)	0.75	0.70

Based on home-grown straw, adjust if bought-in.

* For slatted court omit bedding costs.

Assumptions:

1. Calves from Upland/Lowground Suckler Cows – silage or straw diet.
2. Silage could be costed on a per tonne basis for clamp silage instead of a per hectare basis to reflect the true cost of growing, making, storing and handling silage.

Finishing Year Old Autumn-Born Suckled Calves at 18 Months

GROSS MARGIN DATA

OUTPUT	Steer £/head	Heifer £/head
Sale value (dwt - 1% mortality):		
360 kg @ 485 p (650 kg lwt)	1,729	-
340 kg @ 485 p (600 kg lwt)	-	1,633
Less: Weaned calf (lwt):		
420 kg @ 300 p	1,260	-
380 kg @ 300 p	-	1,140
	<u>469</u>	<u>493</u>
VARIABLE COSTS		
Barley, protein & minerals @ £260/t	250	174
Bedding straw @ £100/t (home-grown)	75	70
Vet & medicines	26	26
Commission, levies & haulage	76	74
	<u>427</u>	<u>344</u>
Gross Margin before forage	42	149
Forage variable costs:		
silage @ £317/ha	48	48
Total Variable costs	<u>475</u>	<u>392</u>
GROSS MARGIN £/head	- 6	101
GROSS MARGIN £/ha (acre)	- 37	676
	-(15)	(274)
Sensitivity-Change ±	Change in Gross Margin/head (£)	
10 p/kg in dwt sale price	35	33
10 p/kg in lwt purchase price	42	38
Not bedded on straw	75	70
£10/t in straw price	8	7

Finishing Year Old Spring-Born Suckled Calves at 18 - 20 Months

PHYSICAL DATA

	Spring-born	
	Yearling steer	Yearling heifer
Purchase/transfer date	April	April
Sale date	December	December
Feeding period (days): at grass	140	140
housed	100	100
Liveweight: at purchase/transfer (kg lwt)	420	380
at housing (kg lwt)	532	492
at sale (kg lwt)	650	600
Deadweight at sale (kg dwt)	370	340
Average daily lwt gain: at grass (kg/day)	0.8	0.8
housed (kg/day)	1.2	1.1
Mortality (%)	0.3	0.3
Feeding:		
concentrates at grass (t)	0.20	0.25
barley/protein/minerals in house (t)	1.1	1.0
straw fed in house (t) ME 6.5 MJ/kg DM	0.1	0.1
Housing system: Straw bedding assumed*		
Straw bedding (t)**	0.25	0.20
Grazing area (ha)	0.23	0.20
Grazing fertiliser (kg N/ha)	125	125
Stocking rate at grass (animals/ha)	4.2	5.0

* Amend bedding costs if on slurry based systems.

** Based on home-grown straw, adjust if bought-in.

Finishing Year Old Spring-Born Suckled Calves at 18 - 20 Months

GROSS MARGIN DATA

OUTPUT	Steer £/head	Heifer £/head
Sale value (dwt - 0.3% mortality):		
370 kg @ 485 p (650 kg lwt)	1,789	-
340 kg @ 485 p (600 kg lwt)	-	1,644
Less: Yearling calf (lwt):		
420 kg @ 300 p	1260	-
380 kg @ 300 p	-	1140
	<u>529</u>	<u>504</u>
VARIABLE COSTS		
Barley, protein & minerals @ £250/t (at grass)	50	63
Barley, protein & minerals @ £250/t (housed)	265	250
Feeding straw @ £100/t (home-grown)	10	10
Bedding straw @ £100/t (home-grown)	25	20
Vet & medicines	19	19
Commission, levies & haulage	77	74
	<u>446</u>	<u>436</u>
Gross Margin before forage	<u>83</u>	<u>68</u>
Forage variable costs:		
grazing @ £233/ha	<u>54</u>	<u>47</u>
Total Variable costs	<u>500</u>	<u>483</u>
GROSS MARGIN £/head	<u>29</u>	<u>21</u>
GROSS MARGIN £/ha (acre)	<u>128 (52)</u>	<u>107 (43)</u>
Sensitivity-Change ±	Change in Gross Margin/head (£)	
10 p/kg in dwt sale price	37	34
10 p/kg in lwt purchase price	42	38
Not bedded on straw	25	20
£10/t in straw price	4	-

Beef Cattle Summer Finishing

PHYSICAL DATA

	Steer	Heifer
Liveweight at purchase (kg)	450	420
Liveweight at slaughter (kg lwt)	600	570
(kg dwt)	330	310
Cattle bought	mid-April	mid-April
Cattle sold	mid-September	mid-September
Mortality (%)	0.15	0.15
Finishing period (days)	150	150
Liveweight gain (kg)	150	150
Daily liveweight gain (kg)	1.0	1.0
Supplementary feed:		
barley, proteins & minerals (kg)	308	250
Grazing area (ha)	0.23	0.20
Grazing fertiliser N (kg/ha)	175	175
Feed levels per day:		
first 8 weeks (kg)	0	0
next 6 weeks (kg)	3	2
next 4 weeks (kg)	4	3

* Feed at this level to finish by mid-September. Many will house by this time if finishing later.

Assumptions:

In practice, a proportion of the following cattle may be sold as forward stores or housed for autumn finishing at heavier weights. If so, additional concentrate feeding will be required.

Beef Cattle Summer Finishing

GROSS MARGIN DATA

OUTPUT	Steer £/head	Heifer £/head
Sale value (dwt):		
330 kg @ 485 p (600 kg lwt)	1,601	-
310 kg @ 485 p (570 kg lwt)	-	1,504
Less: Purchased store calf in April (lwt):		
450 kg @ 300 p	1,350	
420 kg @ 300 p	-	1,260
	<u>251</u>	<u>244</u>
VARIABLE COSTS		
Barley, protein & minerals @ £250/t	77	63
Vet & medicines	19	19
Commission, levies & haulage	73	70
	<u>169</u>	<u>152</u>
Gross Margin before forage	<u>82</u>	<u>92</u>
Forage variable costs:		
grazing @ £233/ha	54	47
Total Variable costs	<u>223</u>	<u>199</u>
GROSS MARGIN £/head	<u>28</u>	<u>45</u>
GROSS MARGIN £/ha (acre)	<u>123 (50)</u>	<u>227 (92)</u>

Sensitivity-Change ±

10 p/kg in dwt sale price	33	31
10 p/kg in lwt purchase price	45	42

Change in Gross Margin/head (£)

33	31
45	42

Calf Rearing Costs to 3 Months

PHYSICAL DATA

	Bucket fed	Ad-lib fed
Liveweight (kg): at birth	40	40
at sale, 3 months	110	115
Liveweight gain (kg/day)	0.78	0.83
Feeding period (days)	90	90
Mortality (%)	5	4
	kg	kg
Feeding*: Milk substitute	28	42
Calf concentrates	160	150
Hay	35	30
Bedding (straw)	0.2	0.2

* Homebred calves receive colostrum followed by whole milk up to 10 days of age.

Calf Rearing Costs to 3 Months

VARIABLE COST DATA

	Bucket fed	Ad-lib
VARIABLE COSTS		
Feed:		
milk substitute @ £2200/t	62	92
calf concentrate @ £360/t	58	54
hay (purchased) @ £105/t	4	3
	<hr/>	<hr/>
	124	149
Vet & medicines & tags	25	25
Bedding straw @ £100/t (home-grown)	20	20
	<hr/>	<hr/>
	45	45
	<hr/>	<hr/>
Total Variable Costs	169	194

Sensitivity-Change ±	Change in costs/head (£)	
£100/t in milk substitute price	2.80	4.20
£10/t in calf concentrate price	1.60	1.50

Assumptions:

1. Dairy calves do not receive SSBSS payments – eligible calves have to be 75% beef genetics.
2. Adjust straw cost if bought-in.

Intensive Finishing of Dairy Bred Bulls

PHYSICAL DATA

	Extensive	Intensive
Breed		
Liveweight at start (kg)	120	120
Feeding period (days)	440	340
Liveweight at slaughter (kg lwt)	600	600
Deadweight at slaughter (kg dwt)	312	312
Killing out percentage (%)	52	52
Overall daily liveweight gain (kg/day)	1.1	1.4
Mortality (%)	2	2
Feeding ¹ :		
110-120 kg liveweight/purchase to slaughter:		
concentrates at grass (t)	0.2	
barley/protein/minerals in house (t)	1.30	2.60
straw (t)	0.1	0.4
silage (t)	5.1	-

- ¹ For home bred calves see '*Calf rearing costs to 3 months*' (pages 172-173) for cost of feeding to 12-14 weeks (or 110-115kg lwt).
- ² If housed on slurry based systems omit bedding costs.
- ³ Adjust straw cost if bought-in.

Intensive Finishing of Dairy Bred Bulls

GROSS MARGIN DATA

	Extensive	Intensive
OUTPUT	£/head	£/head
Sale value (dwt - adj 3% mortality):		
312 kg @ 460 p	1,392	-
312 kg @ 460 p	-	1,392
<i>Less: Calf purchase (3 months):</i>		
@ £460	460	-
@ £460	-	460
	<hr/>	<hr/>
	932	932
VARIABLE COSTS		
Concentrates @ £260/t	338	676
Feeding straw @ £100/t (home-grown)	10	40
Bedding straw @ £100/t (home-grown)	30	60
Vet & medicines	21	21
Commission, haulage & levies, etc.	68	68
Total Variable costs	<hr/>	<hr/>
	467	865
GROSS MARGIN £/head (before forage)	<hr/>	<hr/>
	465	67
Forage variable costs:		
Silage @£352/ha	34	-
Grazing @£252/ha	116	-
Total Variable costs	<hr/>	<hr/>
	617	
GROSS MARGIN £/head	<hr/>	<hr/>
	315	67
Sensitivity-Change ±	Change in Gross Margin/head (£)	
£10/t in concentrate price	13	26
10 p/kg in dwt sale price	30	30

Forage Based Finishing Dairy Steers at 24 Months

PHYSICAL DATA

	Beef
Breed	Cross
Liveweight at start (kg) ¹	120
Feeding period (days)	659
Liveweight at slaughter (kg lwt)	632
Deadweight at slaughter (kg dwt)	316
Killing out percentage (%)	50
Overall daily liveweight gain (kg/day)	0.8
Mortality (%)	3
Feeding:	
110-125 kg liveweight/purchase to slaughter:	
concentrates (2nd stage calf mix) (t)	0.15
concentrates (barley/protein/minerals) (t)	0.68
silage (t) - over two housing periods	6.4
Grazing area - over two summers (ha)	0.42
Silage area - for two housing periods (ha)	0.32
Silage:	
yield	20
DM quality (g/kg)	300
ME quality (MJ/kg DM)	10.6
Silage fertiliser (kg N/ha)	125
Housing system: Straw bedding assumed ² .	
Straw bedding ³ (t)	0.0

¹ For home bred calves see '*Calf rearing costs to 3 months*' (pages 172-173) for cost of feeding to 12-14 weeks (or 110-115kg lwt).

² If housed on slurry based systems omit bedding costs.

³ Adjust straw cost if bought-in.

Forage Based Finishing Dairy Steers at 24 Months

GROSS MARGIN DATA

	Beef Cross³ £/head
OUTPUT	
Sale value (dwt - adj 3% mortality):	
316 kg @ 455 p	1,395
Less: Calf purchase:	
@ £460	<u>460</u>
	<u>935</u>
VARIABLE COSTS	
Concentrate calf mix @ £330/t	39
Concentrate barley blend @ £260/t	177
Bedding straw @ £100/t (home grown)	-
Vet & medicines	37
Commission, haulage & levies, etc.	<u>68</u>
Total Variable costs	<u>321</u>
Gross Margin before forage	<u>614</u>
Forage variable costs:	
silage @ £207/ha	66
grazing @ £177/ha	<u>74</u>
	<u>140</u>
Total Variable costs	<u>461</u>
GROSS MARGIN £/head ¹	<u>474</u>
GROSS MARGIN £/ha (acre) ²	<u>320</u>
Sensitivity-Change ± Change in Gross Margin/head (£) (130)	
£10/t in concentrate price	7
10 p/kg in dwt sale price	30

* Unlike other beef finishing enterprises featured in the Farm

¹ Unlike other beef finishing enterprises featured in the Farm Management Handbook, spanning over two years effectively incurs double the fixed cost share, which is not included above.

² This enterprise produces a strong gross margin per head but the extensive nature of this enterprise dilutes its return per hectare.

Sheep

Introduction

Markets and price drivers

As of December 1, 2023, Defra census figures recorded the UK sheep flock at 21.2 million head, reflecting a 5.1% decrease from the previous year. This marks the lowest recorded population since 2011. The female breeding flock totalled 13.8 million head, representing a 4.3% decline compared to 2022. As a result of this, the UK lamb production is expected to fall by 3% during 2024.

The European national flock decreased by 2.5% on the year, EU sheep meat production is estimated to fall by 4.9% during 2024. The largest decrease in the European flock in 2022/23 was seen in Spain, followed by Romania, Greece and Portugal. Drivers of this reduction include high input costs, high temperatures in Mediterranean countries and Bluetongue virus. Some countries are resorting to finishing at lighter weights to offload animals in challenging climate conditions.

The UK remains the third largest sheep meat exporter, with over 95% of exports to the EU, competing with continental producers, New Zealand and Australia. To address the seasonality of supply and carcass balance issues, the UK exports whole and half carcasses, predominantly to France, Germany and Spain, and imports legs and loins from New Zealand and Australia. The expected reduction in EU production will support the UK export market but the decline in domestic production will limit export potential.

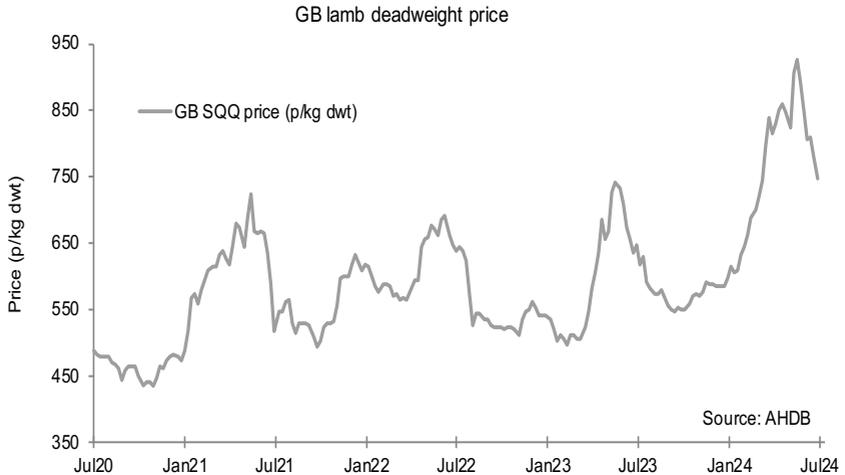
The past year has seen significant changes in the global sheep sector. The free trade agreement between Australia and the UK commenced at the end of May 2023, leading to an increase in the quantity of Australian sheep meat that could potentially be imported to the UK. The Australian flock continues to expand, however closer markets such as China, USA and the Middle East have proven more attractive for Australian producers. The Australian flock has been building, with the last three years consecutively showing record production. However, in 2023, there was a destock due to drought conditions, with the Australian flock now predicted to decrease by 3% to 76.5 million head. In 2023, Australian lamb accounted for over 50% of global sheepmeat exports for the first time, largely at the expense of New Zealand's export market share.

UK domestic consumption of lamb has been declining for decades, but Islamic festivals continue to support demand. Ramadan (predicted 28th February 2025), Eid al-Fitr (predicted 31st March 2025) and Qurbani/Eid al-Adha (predicted 7th June 2025) (dates are subject to the moon phases) will likely benefit hogg price in February/March 2025.

Lamb is a premium product; it is expensive compared with other proteins, such as chicken and pork, and is therefore vulnerable to changes in consumer financial pressures. There is optimism for increasing demand in the future as inflation decreases and wages improve. Domestic

demand for roasts has increased on the year, while processed lamb such as burgers, stewing steak and chops sales have reduced. Stewing steak and chops are the highest value retail cuts.

Producer price is significantly influenced by seasonality of supply as shown in the chart below. Most producers finish their lambs off grass or forage crops, therefore weather influences lamb supply and thus, lamb price. However, there is a trend for increasing lamb price seen year-on-year.



Marketing

Prime lamb sales are typically traded on the spot market, with prices heavily influenced by the timing of sales due to seasonal production patterns. Old season lamb tends to gain value towards the Easter market as supply declines. However, producers face higher costs to either accelerate lamb growth for early markets or delay sales for better prices in early spring. As the season progresses into summer, the market sees an influx of lambs, exceeding domestic demand and increasing reliance on European customers.

The auction market typically accounts for 50% of sheep sales across the UK. Like the cattle market, the live auction system provides an important service. It is a mechanism that brings together sheep and customers to establish a transparent price. The most common method to spread risk, when selling at livestock auctions, is to target multiple sales per year. The future price may be influenced by buyer feedback. Similarly, when selling direct to processors, an improved price may be achieved if a large number of in-specification lambs can be delivered at pre-arranged times.

Supermarket specification lamb accounts for most domestic sales, however, a butcher's lamb is also a sizeable market (c. 10%). Over 40% of lamb marketed is out of specification. Exports include the heavy lamb trade to northern European countries, particularly France, which accounts

for approximately 56% of sheep meat exports. Belgium and Luxemburg are particularly important outlets for E and U grade lambs.

Technical performance

Sheep enterprise margins are inevitably sensitive to the sales price. However, there is limited opportunity to influence the overall market and greater potential exists through improving production efficiency within the farmgate. Top performing flocks consistently rear more lambs, sell more finished (if they are on the right land type) and use less purchased inputs. Whilst fixed costs on these top performing farms may be lower, they are also spread over more kilos of lamb sold (higher output).

Subsidies and support

The Scottish Upland Sheep Support Scheme (SUSSS) is a coupled support payment for sheep to provide additional support to producers on LFASS category A land. The payment rate in 2023 was £61.38 per ewe hogg. This is an annual payment; the actual payment rate is determined by the number of hogg applications each year. The full payment is made during the spring/summer following the year when the claim is made. This support has not been included in the 2024/25 budget gross margins due to the specific nature of scheme eligibility. See Rural Aid Schemes, page 467 for more details.

General Reference Data

Sheep feeding

Suggested daily rations (kg fresh matter) for Scottish Blackface ewes (60 kg lwt) during pregnancy using average quality baled silage (DM 300g/kg, ME 10.5MJ/kg DM) and hay (DM 830g/kg, ME 8.3MJ/kg DM). Concentrate feeds requirements over 0.5kg/d should be split between two feeds.

Weeks before lambing	Single-bearing ewes		Twin-bearing ewes	
	<i>Silage</i>	<i>Concentrates</i>	<i>Silage</i>	<i>Concentrates</i>
8	2.8	0	3.2	0
6	2.8	0	3.2	0.25
4	2.7	0.25	2.7	0.4
2	2.6	0.35	2.7	0.4
	<i>Hay</i>	<i>Concentrates</i>	<i>Hay</i>	<i>Concentrates</i>
8	1.1	0	1.1	0.2
6	1	0.25	1	0.35
4	0.9	0.4	0.8	0.55
2	0.85	0.55	0.7	0.85

Suggested daily rations (kg fresh matter) for crossbred ewes (e.g., mule, 75 kg lwt) during pregnancy using average quality baled silage (DM 300 g/kg, ME 10.5 MJ/kg DM) and hay (DM 830 g/kg, ME 8.3 MJ/kg DM).

Weeks before lambing	Single-bearing ewes		Twin-bearing ewes	
	Silage	Concentrates	Silage	Concentrates
Mid-pregnancy	2.8 *	0	3 *	0
8	3.3	0	4	0
6	3.2	0.1	3	0.3
4	3.1	0.25	2.8	0.5
2	3	0.4	2.8	0.75

	Hay		Concentrates	
	Hay	Concentrates	Hay	Concentrates
Mid-pregnancy	1 *	0	1.1 *	0
8	1.4	0	1.4	0.15
6	1.3	0.2	1.2	0.4
4	1.2	0.4	1.1	0.65
2	1.1	0.6	1	0.95

* restricted amount fed. Requirements in mid-pregnancy can also be met with grazed grass or forage crops such as swedes or fodder beet.

Concentrates based on high quality compound, e.g. ME 12.5 MJ/kg DM and 18% CP (fresh basis). Farmers lambing their flocks from mid-April can meet the pregnant ewe's requirements on well managed grass alone.

Wool

High processing costs and weak consumer demand are negatively affecting wool prices both domestically and globally. In the backdrop of this is the long-term issue of rising production of lower-cost, oil-based synthetic fibres and the availability of cheaper wool from other countries. However, with growing awareness of environmental impacts and the provenance of products, there is an argument for the relevance of UK wool. Most wool is marketed through the British Wool Marketing Board. For more details of wool prices, charges, collection centres and grading depots, please contact the BWMB (www.britishwool.org.uk).

Hard Hill

PHYSICAL DATA

Breeds	Blackface, South Country & Lairg type Cheviot		
	Lambs reared (%)		
	70%	85%	100%
Ewe hoggs wintered	Away	Away	Away
Lamb crops per ewe (avg)	4	4	4
Ram flock life (seasons)	3	3	3
	/100 ewes tupped		
Rams (no.)	3	3	3
Lamb numbers:			
marked	73	88	103
sold/retained	70	85	100
sold: finished lambs	0	0	0
store lambs	44	59	74
flock replacement	26	26	26
Ewe numbers:			
draft/cast	14	15	16
mortalities	12	11	10
Wool sales (kg)	160	160	160
Concentrate feeding (kg)	1,800	1,900	2,000
Hay reserve (/annum) (kg)	2,000	2,000	2,000

Basis of data:

1. Lambs are assumed sold at or by the autumn sales 2024 (estimated price).
2. Lambing percentage reflects the range of performance found; lamb mortality may be greater depending on the location.
3. Mortality in ewe hoggs is assumed to be 3%.
4. Ewe concentrate feeding – 18% CP, ideally a balanced compound with feeding of ewes selected on the basis of scanning results. Assumes self-feed blocks are used on less accessible hills although expensive per unit of energy, ME range 8.5 to 12 MJ/kg DM, total block intake can range from 25-100 blocks/100 ewes.
5. Higher performance can result from better winter nutrition and provision of improved summer grazing for selected ewes, particularly those nursing twins.
6. Grazing is not charged.
7. Hay bought in.
8. Reflects hill farms based in north and west of Scotland.

Hard Hill

GROSS MARGIN DATA

			Lambs reared (%)		
			70%	85%	100%
OUTPUT			£/100 ewes tupped		
Store Lambs	44 @	£57	2,508	-	-
	59 @	£57	-	3,363	-
	74 @	£57	-	-	4,218
Draft/cast ewes:	14 @	£85	1,190	-	-
	15 @	£85	-	1,275	-
	16 @	£85	-	-	1,360
Wool sales 160kg @ £0.18/kg			29	29	29
			3,727	4,667	5,607
Less:	ram replacement (net)		500	500	500
			<u>3,227</u>	<u>4,167</u>	<u>5,107</u>
VARIABLE COSTS					
Sheep feed @ £370/t			666	703	740
Away wintering ewe hoggs at £25/head (inc. haulage)			650	650	650
Vet, medicines & dips			532	542	552
Commission, levies, haulage, shearing, scanning & tags			674	783	892
			<u>2,522</u>	<u>2,678</u>	<u>2,834</u>
Gross margin before forage			<u>705</u>	<u>1,489</u>	<u>2,273</u>
Forage variable costs: hay @ £105/tonne			210	210	210
Total Variable Costs			<u>2,732</u>	<u>2,888</u>	<u>3,044</u>
GROSS MARGIN			<u>495</u>	<u>1,279</u>	<u>2,063</u>

Sensitivity-Change ±

£10/hd in all lamb sales	440
£10/hd in draft ewe price	140
£50/tonne in concentrate price	90
3% in lambing rearing rate	75

Change in Gross Margin/100 ewes (£)

440	590	740
140	150	160
90	95	100
75	101	127

Moderate Hill

PHYSICAL DATA

Breeds	Blackface, South Country & Lairg type Cheviot		
	Lambs reared (%)		
	80%	90%	100%
Ewe hoggs wintered	Away	Away	Away
Lamb crops per ewe (avg)	4	4	4
Ram flock life (seasons)	3	3	3
	/100 ewes tupped		
Rams (no.)	3	3	3
Lamb numbers:			
marked	83	93	103
sold/retained	80	90	100
sold: finished lambs	0	10	15
store lambs	54	54	59
flock replacement	26	26	26
Ewe numbers:			
draft/cast	14	14	16
mortalities	12	12	10
Wool sales (kg)	160	160	160
Concentrate feeding (kg)	1,800	1,900	2,000
Hay reserve (/annum) (kg)	3,000	3,000	3,000

Basis of data:

1. Lambs are assumed sold at or by the autumn sales 2024 (estimated price).
2. Lambing percentage reflects the range of performance found.
3. Mortality in ewe hoggs is assumed to be 3%.
4. Ewe concentrate feeding – 18% CP, ideally a balanced compound with feeding of ewes selected on the basis of scanning results. Assumes self-feed blocks are used on less accessible hills although expensive per unit of energy, ME range 8.5 to 12 MJ/kg DM, total block intake can range from 25-100 blocks/100 ewes.
5. Higher performance can result from better winter nutrition and provision of improved summer grazing for selected ewes, particularly those nursing twins.
6. Grazing is not charged.
7. Reflects hill farms based in Central Scotland

Moderate Hill

GROSS MARGIN DATA

OUTPUT			Lambs reared (%)		
			80%	90%	100%
			£/100 ewes tuppied		
Finished lambs:	10 @	£80	-	800	-
	15 @	£80	-	-	1,200
Store lambs:	54 @	£57	3,078	3,078	-
	59 @	£57	-	-	3,363
Draft/cast ewes:	14 @	£93	1,302	1,302	-
	16 @	£93	-	-	1,488
Wool sales 160kg @ £0.18/kg			29	29	29
			4,409	5,209	6,080
Less: ram replacement (net)			500	500	500
			<u>3,909</u>	<u>4,709</u>	<u>5,580</u>
VARIABLE COSTS					
Sheep feed @ £370/t			666	703	740
Away wintering ewe hoggs at £25/head (inc. haulage)			650	650	650
Vet, medicines & dips			532	542	552
Commission, levies, haulage, shearing, scanning & tags			746	839	935
			<u>2,594</u>	<u>2,734</u>	<u>2,877</u>
Gross margin before forage			<u>1,315</u>	<u>1,975</u>	<u>2,703</u>
Forage variable costs:					
0.6 ha hay @ £338/ha			203	203	203
Total Variable Costs			<u>2,797</u>	<u>2,937</u>	<u>3,080</u>
GROSS MARGIN			<u>1,112</u>	<u>1,772</u>	<u>2,500</u>
Sensitivity-Change ±			Change in Gross Margin/100 ewes (£)		
£10/hd in all lamb sales			540	640	665
£10/hd in draft ewe price			140	140	160
£50/tonne in concentrate price			90	95	100
3% in lambing rearing rate			92	116	137

Improved Hill

PHYSICAL DATA

Breeds	Hill breeds inc Blackface hill type, NCC		
Lambing period	Assumed to commence 2nd week April		
	Lambs reared (%)		
	110%	120%	130%
	Home	Home	Home
Ewe hoggs wintered			
Lamb crops per ewe	4	4	4
Ram flock life (seasons)	3	3	3
	/100 ewes tupped		
Rams (no.)	3	3	3
Lamb numbers:			
marked	113	123	133
sold/retained	110	120	130
sold: ewe lambs	10	20	30
finished lambs	10	20	30
store lambs	62	52	42
flock replacement	28	28	28
Ewe numbers:			
draft/cast	14	15	16
mortalities	10	9	8
Ewe hoggs purchased	0	0	0
Wool sales (kg)	250	250	250
Concentrate feeding (kg)	1,800	1,900	2,000
Silage (ha)	2	2	2
Hay reserve (/annum) (kg)	0	0	0
Bedding straw - 6wk period (kg/day)	80	80	80
Improved permanent pasture assumed (ha)	7.0	7.0	7.0

Basis of data:

1. Estimate of stock prices autumn/early winter 2024.
2. Ewes are first tupped as gimmers.
3. Ewe concentrate feeding – ideally a balanced compound 18% CP.
4. Approximately 14 ewes/hectare on improved pasture (125kg N/ha, see Grassland-Grazing section, page 74) assumed alongside hill grazing (not costed) and silage aftermath (70kg N/ha, one cut, see Grassland Silage and Aftermath, page 76).
5. Straw bedding based on 80 kg/day for 100 ewes housed over a 6-week lambing period.
6. Silage yield and quality 6t DM/ha; ME 10.5 MJ/kg DM.

Improved Hill

GROSS MARGIN DATA

			Lambs reared (%)		
			110%	120%	130%
			£/100 ewes tupped		
OUTPUT					
Ewe lambs:	10 @	£90	900	-	-
	20 @	£90	-	1,800	-
	30 @	£90	-	-	2,700
Finished lambs:	10 @	£108 (36kg lwt)	1,080	-	-
	20 @	£108	-	2,160	-
	30 @	£108	-	-	3,240
Store lambs:	62 @	£80	4,960	-	-
	52 @	£80	-	4,160	-
	42 @	£80	-	-	3,360
Draft/cast ewes:	14 @	£85	1,190	1,190	1,190
Wool sales 250kg @ £0.18/kg			45	45	45
			<u>8,175</u>	<u>9,355</u>	<u>10,535</u>
Less:	ram replacement (net)		500	500	500
			<u>7,675</u>	<u>8,855</u>	<u>10,035</u>
VARIABLE COSTS					
Sheep feed @ £350/t			630	665	700
Vet, medicines & dips			678	688	698
Bedding straw @ £125/t (bought-in)			420	420	420
Commission, levies, haulage, shearing, scanning & tags			1,038	1,150	1,262
			<u>2,766</u>	<u>2,923</u>	<u>3,080</u>
Gross margin before forage			<u>4,909</u>	<u>5,932</u>	<u>6,955</u>
Forage variable costs:					
2 ha silage @ £207/ha			414	414	414
improved permanent pasture @ £177/ha			1,239	1,239	1,239
			<u>1,653</u>	<u>1,653</u>	<u>1,653</u>
Total Variable Costs			<u>4,419</u>	<u>4,576</u>	<u>4,733</u>
GROSS MARGIN			<u>3,256</u>	<u>4,279</u>	<u>5,302</u>
GROSS MARGIN per forage ha			362	475	589
Sensitivity-Change ±			Change in Gross Margin/100 ewes (£)		
10 p/kg lwt in finished lamb price			35	69	104
£5/hd in all lamb sales			410	460	510
£5/hd in cast ewe price			70	70	70
10% lamb rearing rate			694	812	930

Draft Blackface Ewes

PHYSICAL DATA

Breeds	Draft Blackface to a terminal or crossing sire		
Lambing period	Commencing mid-March		
	Lambs reared (%)		
	130%	140%	150%
Ewe flock life (seasons)	1.5	1.5	1.5
Ram flock life (seasons)	3	3	3
	/100 ewes tupped		
Rams (no.)	2.5	2.5	2.5
Lamb numbers:			
marked	133	143	153
sold/retained	130	140	150
sold:			
store	13	14	15
finished	52	56	60
breeding	65	70	75
Ewe numbers:			
sales	64	64	64
mortalities	3	3	3
purchased	67	67	67
Wool sales (kg)	250	250	250
Concentrate use:			
Ewe concentrate: ME 12.5 MJ/kg, 18% CP (kg)	3,000	3000	3,000
Forage: hay - 12,600 kg and			
aftermath grazing (ha)	2.5	2.5	2.5
grazing (ha)	7.0	7.0	7.0
Total forage (ha)	<u>9.5</u>	<u>9.5</u>	<u>9.5</u>
Bedding straw (kg/day)	80	80	80

Basis of data:

1. This enterprise often supplies ewe lambs for a crossbred flock enterprise on farm, therefore all ewe lambs might be kept. Estimated breeding stock prices, autumn, help determine the value of this.
2. Estimate of finished and store lamb prices, summer and autumn 2024.
3. Silage yield and quality 6 t DM/ha; ME 10.5 MJ/kg DM.
4. Liveweight of lambs at sale: 36 kg, 32 kg store or sold as ewe lambs for breeding.
5. Straw bedding based on 80 kg/day for 100 ewes housed over a 6-week lambing period.
6. Approximately 14 ewes/hectare on improved pasture (125kg N/ha, see Grassland-Grazing section, page 74) assumed alongside hill grazing (not costed) and silage aftermath (70kg N/ha, one cut, see Grassland Silage and Aftermath, page 76).

Draft Blackface Ewes

GROSS MARGIN DATA

OUTPUT	Lambs reared (%)		
	130%	140%	150%
	£/100 ewes tupped		
Ewe lambs: 65 @ £139	9,035	-	-
70 @ £139	-	9,730	-
75 @ £139	-	-	10,425
Finished lambs: 13 @ £108 (36 kg lwt)	1,404	-	-
14 @ £108 (36 kg lwt)	-	1,512	-
15 @ £108 (36 kg lwt)	-	-	1,620
Store lambs: 52 @ £80	4,160	-	-
56 @ £80	-	4,480	-
60 @ £80	-	-	4,800
Cast ewes: 64 @ £85	5,440	5,440	5,440
Wool sales 250kg @ £0.18/kg	45	45	45
	20,084	21,207	22,330
Less: ewes purchased - 67 @ £93 ram replacement (net)	6,231	6,231	6,231
	625	625	625
	13,228	14,351	15,474
VARIABLE COSTS			
Ewe concentrate @ £350/t	1,050	1,050	1,050
Vet, medicines & dips	721	731	740
Bedding straw @ £125/t (bought-in)	420	420	420
Commission, levies, haulage, shearing, scanning & tags	1,838	1,918	2,000
	4,029	4,119	4,210
Gross margin before forage	9,199	10,232	11,264
Forage variable costs:			
silage @ £207/ha	518	518	518
grazing @ £177/ha	1,239	1,239	1,239
Total Variable Costs	5,786	5,876	5,967
GROSS MARGIN	7,442	8,475	9,507
GROSS MARGIN per forage ha	783	892	1,001

Sensitivity-Change ±

Change in Gross Margin/100 ewes (£)

£5/hd in store lamb price	260	280	300
£5/hd in breeding stock value	325	350	375
£5/hd in cast ewe price	320	320	320
£5/hd in ewe purchase price	335	335	335
10% lamb rearing rate	1,460	1,572	1,685

Crossbred Ewes

PHYSICAL DATA

Breeds	Large crossbred (75-85kg) e.g. Scotch Mule, Mule-cross		
Breed of ram	Terminal Sire		
Lambing period	Commencing early April		
	Lambs reared (%)		
Lambing period	140%	160%	180%
Lamb crops per ewe (avg)	4.5	4.5	4.5
Ram flock life (seasons)	3	3	3
	/100 ewes tupped		
Rams (no.)	2.5	2.5	2.5
Lamb numbers:			
marked	142	162	182
sold/retained	140	160	180
sold: finished lambs	120	140	160
store lambs	20	20	20
Ewe numbers:			
culls	17	17	17
mortalities	5	5	5
gimmers purchased	25	25	25
Wool sales - ewes, rams & hoggs (kg)	270	270	270
Ewe concentrate: ME 12.5 MJ/kg DM, 18% CP (kg)	4,500	4,500	4,500
Forage: improved grazing (ha)	7.0	7.0	7.0
silage (ha)	2	2	2
Total forage (ha)	<u>9</u>	<u>9</u>	<u>9</u>
Bedding straw (kg/day)	<u>80</u>	<u>80</u>	<u>80</u>

Basis of data:

1. Estimates of gimmer, finished and store lamb and cast ewe prices, autumn 2024. Finished lambs at 42 kg, store 34 kg.
2. Bedding straw based on 80 kg/day for 100 ewes housed over a 6-week lambing period. This can be deducted if no housing required.
3. Modern rams are capable of running at 80/100:1 in lowland flocks, stocked tightly.
4. Approximately 14 ewes/hectare on improved pasture (125kg N/ha, see Grassland-Grazing section, page 74) assumed alongside hill grazing (not costed) and silage aftermath (70kg N/ha, one cut, see Grassland Silage and Aftermath, page 76)
5. Silage yield and quality 6 t DM/ha; ME 10.5 MJ/kg DM.
6. Concentrate feeding will vary; systems with higher silage quality and better pasture utilisation will use less concentrates.

Crossbred Ewes

GROSS MARGIN DATA

OUTPUT

	Lambs reared (%)		
	140%	160%	180%
	£/100 ewes tupped		
Finished lambs: 120 @ £126 (42kg lwt)	15,120	-	-
140 @ £126	-	17,640	-
160 @ £126	-	-	20,160
Store lambs: 20 @ £85	1,700	-	-
20 @ £85	-	1,700	-
20 @ £85	-	-	1,700
Cast ewes: 17 @ £93	1,581	1,581	1,581
Wool sales 270kg @ £0.3/kg	81	81	81
	18,482	21,002	23,522
Less: gimmers purchased - 25 @ £200	5,000	5,000	5,000
ram replacement (net)	625	625	625
	12,857	15,377	17,897
VARIABLE COSTS			
Ewe concentrate @ £350/t	1,575	1,575	1,575
Vet, medicines & dips	810	820	830
Bedding straw @ £125/t (bought-in)	420	420	420
Commission, levies, haulage, shearing, scanning & tags	1,788	1,991	2,194
	4,593	4,806	5,019
Gross margin before forage	8,264	10,571	12,878
Forage variable costs:			
silage @ £207/ha	414	414	414
grazing @ £177/ha	1,239	1,239	1,239
Total Variable Costs	6,246	6,459	6,672
GROSS MARGIN	6,611	8,918	11,225
GROSS MARGIN per forage ha	735	991	1,247

Sensitivity-Change ±

Change in Gross Margin/100 ewes (£)

£5/hd in all lamb sales	700	800	900
£5/hd in cast ewe price	85	85	85
£5/hd in gimmer price	125	125	125
10% lamb rearing rate	1,682	1,934	2,186
30% change in stocking rate	372	372	372

Pure Maternal Flock

PHYSICAL DATA

Breeds Mid-sized (60-70kg) e.g. Lleyn, Romney, Aberfield, Easycare
 Lambing period March-April

	Lambs reared (%)		
	140%	160%	180%
Lamb crops per ewe	4.5	4.5	4.5
Ram flock life (seasons)	3	3	3
	/100 ewes tupped		
Rams (no.)	2.5	2.5	2.5
Lamb numbers:			
marked	142	162	182
sold/retained	140	160	180
sales:			
ewe lambs	25	35	45
finished lambs	74	82	90
store lambs	16	18	20
flock replacements	25	25	25
Ewe numbers:			
culls	18	18	18
mortalities	4	4	4
gimmers purchased	-	-	-
Wool sales (kg)	270	270	270
Ewe concentrate: ME 12.5 MJ/kg, 18%CP (kg)	1,700	1,700	1,700
Forage: grazing (ha)	7.0	7.0	7.0
silage (ha)	2.0	2.0	2.0
Total forage (ha)	9	9	9
Bedding straw (kg/day)	80	80	80

Basis of data:

1. Estimate of ewe lamb, finished and store lamb prices, cast ewe prices, summer and autumn 2024.
2. Finished lambs liveweight at sale, 38 kg, store lambs 32 kg.
3. Bedding straw based on 80 kg/day housed over a 6-week period. This can be deducted if no housing required.
4. Modern rams can run at 80/100:1 in lowland flocks, stocked tightly.
5. Approximately 14 ewes/hectare on improved pasture (125kg N/ha, see Grassland-Grazing section, page 74) assumed alongside hill grazing (not costed) and silage aftermath (70kg N/ha, one cut, see Grassland Silage and Aftermath, page 76).
6. Silage yield and quality 6 t DM/ha; ME 10.5 MJ/kg DM.
7. Concentrate feeding will vary; systems with higher silage quality and better pasture utilisation will use less concentrates.

Pure Maternal Flock

GROSS MARGIN DATA

OUTPUT	Lambs reared (%)		
	140%	160%	180%
	£/100 ewes tupped		
Ewe lambs: 25 @ £139	3,475	-	-
35 @ £139	-	4,865	-
45 @ £139	-	-	6,255
Finished lambs: 74 @ £114 (38kg lwt)	8,436	-	-
82 @ £114	-	9,348	-
90 @ £114	-	-	10,260
Store lambs: 16 @ £80	1,280	-	-
18 @ £80	-	1,440	-
20 @ £80	-	-	1,600
Draft/cast ewes: 18 @ £93	1,674	1,674	1,674
Wool sales 270kg @ £0.3/kg	81	81	81
(add £290/100 ewes for Romney wool)	14,946	17,408	19,870
Less: ram replacement (net)	625	625	625
	<u>14,321</u>	<u>16,783</u>	<u>19,245</u>
VARIABLE COSTS			
Barley, protein & minerals @ £350/t	595	595	595
Vet, medicines & dips	913	924	935
Bedding straw @ £125/t (bought-in)	420	420	420
Commission, levies, haulage, shearing, scanning & tags	1,458	1,639	1,821
	<u>3,386</u>	<u>3,578</u>	<u>3,771</u>
Gross margin before forage	<u>10,935</u>	<u>13,205</u>	<u>15,474</u>
Forage variable costs:			
silage @ £207/ha	414	414	414
grazing @ £177/ha	1,239	1,239	1,239
	<u>1,653</u>	<u>1,653</u>	<u>1,653</u>
Total Variable Costs	<u>5,039</u>	<u>5,231</u>	<u>5,424</u>
GROSS MARGIN	<u>9,282</u>	<u>11,552</u>	<u>13,821</u>
GROSS MARGIN per forage ha	1,031	1,284	1,536

Sensitivity-Change ±

Change in Gross Margin/100 ewes (£)

£5/hd in all lamb sales	575	675	775
£5/hd in cast ewe price	90	90	90
10% lamb rearing rate	1319	1565	1812
30% change in stocking rate	372	372	372

Early Finished Lamb Production

PHYSICAL DATA

Breeds	Suffolk/Continental cross ewe to terminal sire		
Lambing period	Mid-December to end January		
	Lambs reared (%)		
	140%	160%	180%
Lamb crops per ewe (avg)	5	5	5
Ram flock life (seasons)	3	3	3
	/100 ewes tupped		
Rams (no.)	2.5	2.5	2.5
Lamb numbers:			
marked	143	163	183
sold finished	140	160	180
Lamb liveweight at slaughter (kg)	40	40	40
Lamb deadweight at slaughter (kg)	19	19	19
Ewe numbers:			
culls	18	18	18
mortalities	4	4	4
gimmers purchased	26	26	26
Wool sales - ewes, rams & hogs (kg)	270	270	270
Concentrate use:			
ewe concentrate: ME 12.5 MJ/kg, 18% CP (kg)	5,000	6,000	7,000
lamb concentrate (kg)	4,000	5,000	6,000
Total concentrate (kg)	<u>9,000</u>	<u>11,000</u>	<u>13,000</u>
Forage: silage (ha)	2.4	2.4	2.4
grazing (ha)	5.6	5.6	5.6
Total forage (ha)	<u>8.0</u>	<u>8.0</u>	<u>8.0</u>
Bedding straw (kg/day)	80	80	80

Basis of data:

1. Breeding stock prices, autumn 2024.
2. Finished lamb prices, May-June average.
3. Bedding straw based on 80 kg/day for 100 ewes housed over a 12-week housing period.
4. Modern rams are capable of running at 80/100:1 in lowland flocks, stocked tightly.
5. Ewes housed over winter. Lambs creep fed at grass
6. Approximately 18 ewes/hectare on improved pasture (125kg N/ha, see Grassland-Grazing section, page 74) assumed alongside silage aftermath (70kg N/ha, one cut, see Grassland Silage and Aftermath, page 76).

Early Finished Lamb Production

GROSS MARGIN DATA

OUTPUT	Lambs reared (%)		
	140%	160%	180%
	£/100 ewes tupped		
Finished lambs 140 @ £152 (40 kg lwt)	21,280	-	-
160 @ £152	-	24,320	-
180 @ £152	-	-	27,360
Cast ewes: 18 @ £110	1,980	1,980	1,980
Wool sales 270kg @ £0.3/kg	81	81	81
	23,341	26,381	29,421
Less: gimmers purchased - 26 @ £200	5,200	5,200	5,200
ram replacement (net)	625	625	625
	17,516	20,556	23,596
VARIABLE COSTS			
Barley, protein & minerals @ £350/t	1,750	2,100	2,450
Lamb concentrate @ £330/t	1,320	1,650	1,980
Vet, medicines & dips	695	696	698
Bedding straw @ £125/t (home-grown)	840	840	840
Commission, levies, haulage, shearing, scanning & tags	2,019	2,243	2,467
	6,624	7,529	8,435
Gross margin before forage	10,892	13,027	15,161
Forage variable costs:			
silage @ £207/ha	497	497	497
grazing @ £177/ha	991	991	991
Total Variable Costs	8,112	9,017	9,923
GROSS MARGIN	9,404	11,539	13,673
GROSS MARGIN per forage ha	1,176	1,442	1,709
Sensitivity-Change ±	Change in Gross Margin/100 ewes (£)		
10 p/kg lwt in finished lamb price	538	614	691
£5/hd in cast ewe price	90	90	90
£5/hd in gimmer price	130	130	130
£10/tonne concentrate price	90	110	130
10% lamb rearing rate	2,128	2,432	2,736

Low Cost System

PHYSICAL DATA

Breeds	Mid-sized (60-70 kg) Maternal bred ewe		
Lambing period	late April/May		
	Lambs reared (%)		
	140%	150%	160%
Lamb crops per ewe	4.5	4.5	4.5
Ram flock life (seasons)	3	3	3
	/100 ewes tupped		
Rams (no.)	2.0	2.0	2.0
Lamb numbers:			
marked	144	154	164
sold/retained	140	150	160
sales:			
ewe lambs	10	20	30
finished lambs	68	68	68
store lambs	40	40	40
Ewe numbers:			
culls	18	18	18
mortalities	4	4	4
Wool sales (kg)	270	270	270
Concentrate use:			
lamb finishing supplement (kg)	500	500	500
Forage: grazing (ha)	7.0	7.0	7.0
silage aftermath (ha)	1.7	1.7	1.7
Total forage (ha)	<u>8.7</u>	<u>8.7</u>	<u>8.7</u>

Basis of data:

1. Breeding stock price estimates, autumn 2024.
2. Estimate of finished and store lamb prices, autumn 2024.
3. Lambs sold finished October/November, store September/October.
4. Wool shedding breeds can reduce costs further.
5. Liveweight of lambs at sale: 38 kg.
6. Modern rams can run at 80/100:1 in lowland flocks, stocked tightly.
7. Minimal targeted late pregnancy feeding to triplet-bearing ewes, with some feed in reserve for extreme weather. Hoggs should be trained to eat concentrates.
8. Approximately 14 ewes/ha on improved pasture (125kg N/ha, see Grassland-Grazing section, page 74) assumed alongside silage aftermath (70kg N/ha, one cut, see Grassland Silage and Aftermath, page 76).

Low Cost System

GROSS MARGIN DATA

		Lambs reared (%)		
		140%	150%	160%
		£/100 ewes tugged		
OUTPUT				
Ewe lambs	10 @ £139	1,390	-	-
	20 @ £139	-	2,780	-
	30 @ £139	-	-	4,170
Finished lambs:	68 @ £114 (38kg lwt)	7,752	-	-
	68 @ £114	-	7,752	-
	68 @ £114	-	-	7,752
Store lambs:	40 @ £61	2,440	-	-
	40 @ £61	-	2,440	-
	40 @ £61	-	-	2,440
Draft/cast ewes:	18 @ £130	2,340	2,340	2,340
Wool sales 270kg @ £0.3/kg		-	-	-
		13,922	15,312	16,702
Less: ram replacement (net)		500	500	500
		13,422	14,812	16,202
VARIABLE COSTS				
Supplementary feed @ £330/t		165	165	165
Vet, medicines & dips		544	554	564
Commission, levies, haulage, scanning & tags		1,309	1,399	1,490
		2,018	2,118	2,219
Gross margin before forage		11,404	12,694	13,983
Forage variable costs:				
silage @ £207/ha		352	352	352
grazing @ £177/ha		1,239	1,239	1,239
		1,591	1,591	1,591
Total Variable Costs		3,609	3,709	3,810
GROSS MARGIN		9,813	11,103	12,392
GROSS MARGIN per forage ha		1,128	1,276	1,424
Sensitivity-Change ±		Change in Gross Margin/100 ewes (£)		
10 p/kg lwt in finished lamb price		248	248	248
£5/hd in all lamb sales		590	640	690
£5/hd in cast ewe price		90	90	90
10% lamb rearing rate		1158	1297	1436
30% change in stocking rate		477	477	477

Gimmering

PHYSICAL DATA

Breeds

System

Ewe lambs purchased in autumn, wintered on swedes and silage, grazed tightly in summer and sold as gimmers in autumn

	/100 sheep
Mortalities (no.)	2
Wool sales (kg)	270
Concentrate use:	
Barley (kg)	0
Forage: silage (ha)	1.5
swedes (ha)	2.5
grazing (ha)	5.0
Total forage (ha)	<u>9.0</u>

Basis of data:

1. Ewe lamb price, autumn 2024.
2. Estimate of gimmer price, autumn 2025.
3. Silage yield and quality 6 t DM/ha; ME 10.5 MJ/kg DM.
4. Silage and aftermath grazing.
5. Yield of swedes 75 t/ha. See page 102-103 for swede production costs.
6. Opportunity to rear gimmers on a contract basis or mate the ewe lambs and keep or sell progeny
7. Approximately 20 ewes/ha on improved pasture (125kg N/ha, see Grassland-Grazing section, page 74) assumed alongside silage aftermath (70kg N/ha, one cut, see Grassland Silage and Aftermath, page 76).

Gimmering

GROSS MARGIN DATA

	£/100 sheep
OUTPUT	
Crossbred gimmers: 98 @ £200	19,600
Wool sales 270kg @ £0.3/kg	81
	<hr/>
	19,681
Less: Crossbred ewe lambs purchased - 100 @ £139	13,900
	<hr/>
	5,781
VARIABLE COSTS	
Concentrates - barley & minerals @ £290/t	-
Vet, medicines & dips	373
Commission, levies, haulage, shearing, scanning & tags	1,612
	<hr/>
	1,985
	<hr/>
Gross margin before forage	3,796
Forage variable costs:	
silage @ £207/ha	311
swedes @ £163/ha	408
grazing @ £177/ha	885
	<hr/>
Total Variable Costs	3,589
	<hr/>
GROSS MARGIN	2,192
	<hr/>
GROSS MARGIN per forage ha	244

Sensitivity-Change ±	Change in Gross Margin/100 sheep (£)
£5/hd in sale price	490

Short Keep Lambs - Winter Finishing on Rape

PHYSICAL DATA

System	Store lambs purchased in September/October, sold finished November/December	
Grazing period: range, low to high		
stocking period (days)		45-75
average (days)		55
Stocking rate: range (no./ha)		40-60
average (no./ha)		50
Liveweight at start (kg)		27
Liveweight at slaughter (kg)		42
Deadweight at slaughter (kg)		19
		/100 lambs
Mortalities (no.)		2
Area of rape (ha)		2
Area of grass 'run-back' (ha)		0.6
Concentrates (cereal) fed (t)		1

Basis of data:

1. Estimate of store lamb price, autumn 2024.
2. Estimate of finished lamb/hogg price, November/December 2024.
3. Performance from lambs grazing rape can vary greatly between years. The requirement for supplementary concentrates is also very variable from year to year, and area to area. Cereal supplementation will be more necessary in higher rainfall areas, and it may be difficult to finish lambs in very high rainfall areas. Small lambs under 25 kg liveweight fail to perform well on rape and should be finished inside. A dry run back area with suitable forage and water should be provided. See page 98-99 for forage rape production costs.
4. Grazed on pasture without N fertiliser see Grassland-Grazing section, page 74.

Short Keep Lambs - Winter Finishing on Rape

GROSS MARGIN DATA

OUTPUT	£/100 lambs
Finished lambs: 98 @ £130 (42 kg lwt)	12,740
Less: Store lambs purchased - 100 @ £61	<u>6,100</u>
	6,640
VARIABLE COSTS	
Concentrates - barley & minerals @ £290/t	290
Vet & medicines	186
Commission, levies, haulage, shearing, scanning & tags	<u>1,330</u>
	1,806
Gross margin before forage	<u>4,834</u>
Forage variable costs:	
forage rape @ £161/ha	<u>322</u>
Total Variable Costs	<u>2,128</u>
GROSS MARGIN	<u>4,512</u>
GROSS MARGIN per forage ha	1,735
Sensitivity-Change ±	Change in Gross Margin/100 lambs (£)
£5/hd in lamb sale price	490

Short Keep Lambs - Indoor Finishing on Concentrates

PHYSICAL DATA

System	Store lambs housed in December, sold finished February
Liveweight at housing (kg)	28
Liveweight at slaughter (kg)	36
Deadweight at slaughter (kg)	16.5
Food conversion efficiency (kg feed/kg lwt gain)	range 7-10
Finishing period (days)	60
Daily liveweight gain (g)	100-150
	/100 lambs
Mortalities (no.)	3
Concentrates: whole barley (kg)	4,020
sugar beet pulp (kg)	1,610
protein supplement (46% CP) (kg)	805
salt/minerals/vitamins (kg)	165
Total mix (kg)	<u>6,600</u>
Silage feeding (kg freshweight)	7,900
Bedding straw (housed period) (kg/day)	80

Basis of data:

1. Estimate of store lamb price, autumn 2024.
2. Estimate of finished lamb price, February 2025.
3. Suitable for late-born smaller lambs, non-standard types, any lambs under 25 kg liveweight and lambs that have failed to finish outside e.g. ram lambs, thin lambs.
4. Profitability depends on rising lamb prices rather than food conversion efficiency.
5. Care should be taken when introducing housed lambs to concentrate feeding where starchy cereals (e.g., barley) are used. Acidosis can often result, causing digestive upsets and in some cases, mortality. Typical feed conversion rate is 8.25 kg concentrate to produce 1 kg lwt (including concentrate fed during introductory period), for Blackface and other hill breeds. Crossbred lambs convert at 7-7.5 kg when gaining from 30-35 kg to 40-45 kg. Minerals will contain no Mg and low P.

Short Keep Lambs - Indoor Finishing on Concentrates

GROSS MARGIN DATA

OUTPUT	£/100 lambs
Finished lambs: 97 @ £130 (36 kg lwt)	12,610
Less: Store lambs purchased - 100 @ £61	6,100
	<hr/>
	6,510
VARIABLE COSTS	
Concentrates homemix @ £330/t	2,178
Vet & medicines	186
Bedding straw @ £125/t (bought-in)	420
Commission, levies, haulage, shearing, scanning & tags	1,318
	<hr/>
	4,102
	<hr/>
Gross margin before forage	2,408
Forage variable costs:	
silage @ £207/ha	82
Total Variable Costs	<hr/>
	4,184
	<hr/>
GROSS MARGIN	2,326

Sensitivity-Change ±	Change in Gross Margin/100 lambs (£)
10 p/kg lwt in finished lamb price	363
£5/hd in store lamb purchase price	500
£10/t in concentrate price	66
10 days in finishing period - straw, feed and silage	462

Long Keep Lambs - Finishing on Swedes

PHYSICAL DATA

System	Store lambs purchased in September/October, run over stubbles and grassland to mid-December, folded on swedes to end March/mid-April
Liveweight at start (kg)	27
Liveweight at slaughter (kg)	44
Deadweight at slaughter (kg)	21
Finishing period (days)	180
	/100 lambs
Mortalities (no.)	4
Concentrates: barley and minerals (kg)	1,750
Forage: silage (ha)	0.50
swedes (ha)	1.40
Total forage area (ha)	<hr/> <u>1.90</u>

Basis of data:

1. Estimate of store lamb price, autumn 2024.
2. Estimate of finished hogg price, spring 2025.
3. Silage yield and quality 6 t DM/ha; ME 10.5 MJ/kg DM.
4. Yield of Swedes - 75 t/ha. See pages 102-103 for swede production costs. Use winter hardy varieties of swedes after December. A dry run back area with suitable forage and water should be provided. Supplement with additional protein if swede tops lost by frost and no grassy runback available. Provide access to dry lying area.
5. Grazing cost not included.

Long Keep Lambs - Finishing on Swedes

GROSS MARGIN DATA

	£/100 lambs
OUTPUT	
Finished lambs: 96 @ £150 (44 kg lwt)	14,400
Less: Store lambs purchased - 100 @ £61	<u>6,100</u>
	<u>8,300</u>
VARIABLE COSTS	
Concentrates @ £330/t	578
Vet & medicines	396
Commission, levies, haulage, shearing, scanning & tags	<u>1,385</u>
	<u>2,359</u>
Gross margin before forage	<u>5,941</u>
Forage variable costs:	
silage @ £207/ha	104
swedes @ £163/ha	228
grazing @ £177/ha	<u>-</u>
Total Variable Costs	<u>2,691</u>
GROSS MARGIN	<u>5,609</u>

Sensitivity-Change ±	Change in Gross Margin/100 lambs (£)
£5/hd in lamb sale price	480
£5/hd in store purchase price	500

Red Deer

Introduction

There was a 20 per cent increase in numbers of farmed deer in Scotland during 2023 to 14,900 compared with the five-year average (12,400 animals) according to Scotland's 2023 Agricultural Census. Farmed deer numbers have significantly increased since 2017 although Scotland's venison production which comes predominantly from venison from wild deer has remained relatively stable at around 3,500 tonnes, with farmed production only around 120 tonnes. The total UK venison market is estimated to be worth £100m with the farm sector in Scotland valued at approximately £540k. The Covid-19 pandemic and subsequent cost of living crisis have been major factors in holding back growth. Up until the COVID-19 pandemic, UK retail sales of venison had steadily grown with research by Kantar showing that the UK venison retail market had grown by 12% in value in 2019 (20% in volume) with that growth continuing through 2020. Growth has now slowed and indeed UK retail venison sales are in decline, the latest research compiled by The Knowledge Bank showing a drop in volume of 16.5% between 2021 and 2022 effectively taking the sector back to where it was in 2019/20, although it is understood that latest reports indicate that by early 2024 there has been some recovery in sales across the UK retail sector.

UK supply remains supplemented by some imported venison to meet demand at certain times of the year. However, imports have reduced in recent years with New Zealand prioritising other markets including the USA.

Prior to COVID-19 and its impact on the catering, food service, restaurants, and events markets, there was a drive in Scotland to encourage increased production of Scottish farmed venison and in so doing, reduce reliance on imports. Much of the wild venison that was held in cold storage as a result of the pandemic has now moved into the supply chain and in 2021/22 some processors were looking for additional supply. Scottish government policy is now to increase the annual cull of wild deer by some 50,000 animals per annum to combat climate change and promote biodiversity recovery and, notwithstanding a potential lack of processing infrastructure, this will inevitably lead to an erosion of the farmed deer market as this additional volume is funnelled into the supply chain at a lower cost.

Scottish Venison revised and relaunched its 2018 strategy in 2023 and that refreshed strategy 'Revisiting beyond the Glen' covers the sector up to 2030.

It is the task of the Scottish Venison Association (now Scottish Venison) to implement the strategy. It is likely that following this dip in the market and rising input costs particularly for fencing, and additional pressure to increase the wild deer cull across the whole UK, targets to increase

farmed venison output from a baseline of 100 tonnes in 2018 have been significantly scaled back.

Changes in subsidy and the relative profitability of farmed deer compared to beef and sheep plus sustaining the market for farmed venison in the face of increasing volumes of less expensive wild product are key factors. Brexit has made export of wild venison more difficult into Europe and this may also result in additional volumes coming onto the domestic market. We are likely to find that more wild roe venison, which is traditionally exported to Europe, is available for the UK market although north European markets will remain important for late season stag venison.

Support and subsidies

Historically, deer farming did not attract support payments and subsidies putting it at a disadvantage to cattle and sheep farming. However, the reformed CAP regime latterly allowed deer farmers to claim support payments under the Basic Payment Scheme. Scottish deer farmers remained disadvantaged however in that specific grant schemes (such as the SACGS) did not allow inclusion of deer-specific equipment such as crushes. With the passing of the Agriculture and Communities (Scotland) Bill in 2024 however, venison - both wild and farmed - is now included in the legislation as eligible for support which is a major step forward.

Starting deer farming

The main barriers to entering deer farming are the start-up costs which are estimated at upwards of £120,000 for a 100 hind breeding herd. Red deer breeding hinds will generally cost from £350 - £600 for pedigree stock with breeding stags costing from £1000 - £3,000. Other significant costs include fencing at £15.00 - £20.00/m (fencing costs continue to increase substantially due to the soaring price of timber and wire) and handling facilities, crush and weigh scales at £15,000 - £25,000.

Other barriers include access to an abattoir, obtaining breeding stock and specialist knowledge relating to the industry. Some of these factors have been addressed and, as the sector has grown, quality Scottish-bred breeding stock is now readily available. The work of the British Deer Farms and Parks Association (BDFPA) and the Venison Advisory Service which ran a series of knowledge transfer days in 2023 through FAS Connect, and which continue through 2024, provide a regular forum for Scotland's deer farmers to discuss, share and develop ideas sector.

Once set up, there is a relatively low labour demand for deer farming meaning that it may fit well with existing livestock or arable enterprises. In general, deer are relatively healthy and free from disease. The main health issues are TB, Johne's disease, cryptosporidium, copper deficiency, lungworm and increasingly liver fluke, all of which are manageable with good practice. Scotland also remains officially and internationally recognised as free of bovine TB and measures are taken to ensure this status remains.

Farmed venison processing and markets

Deer farmers are unique in the livestock sector in being able to kill their deer either on the farm or in an abattoir. Deer for slaughter must be examined ante-mortem by a vet within 72 hours of death unless being transported to and killed in an abattoir. The meat must be processed through facilities that have been licensed and regularly inspected by the Food Standards Agency or Food Standards Scotland. Only two supermarkets in the UK purchase farmed venison generally from abattoir killed carcasses.

Following the closure of the Fife abattoir in 2022 there is only one dedicated abattoir in the UK killing Scottish farmed deer.

It is a QA requirement for the industry that all deer farms must have a physical vet inspection at least annually and Deer Health Plans kept updated.

Most Scottish finished farmed deer are processed directly through the Dovecote Park producer group through state-of-the-art slaughter and processing facilities in Yorkshire. This group comprises members who farm deer to the highest welfare standards and are audited annually. All farms have Quality Assurance. Dovecote supplies high-end retail and selected foodservice outlets.

Another option is for farmers to sell their deer to finishers. There are several producers in England and Scotland that will accept deer from six months old and finish them on their own farm before processing.

Field slaughter remains an option for small numbers albeit this requires both ante and postmortem vet inspection and, because of low volumes, may not be a realistic alternative.

Venison Market and Consumer Information

The latest market research undertaken by The Knowledge Bank for venison is available on the Scottish Venison Association Website (www.scottish-venison.info/what-is-the-scottish-venison-association).

References

A range of information relating to deer farming is available from the organisations below:

- “Revisiting Beyond the Glen”. A refreshed strategy for the Scottish Venison Sector to 2030 <https://www.scottish-venison.info/wp-content/uploads/2023/11/21803-Playfair-Walker-Scottish-Venison-Strategy-A4-Report-081123-SCREEN-SINGLES.pdf> “
- Scottish Venison: <https://www.scottish-venison.info>
- The Venison Advisory Service: www.venisonadvisory.co.uk/
- The Deer Farm & Park Demonstration Project: <http://deerfarmdemoproject.scottish-venison.info/>
- The British Deer Farms and Parks Association: <http://bdfpa.org/>
- Quality Assured Farm Venison Scheme: <https://www.saiglobal.com/assurance/farm-assurance/quality-assured-farm-venison.htm>

Red Deer - Lowground Breeding and Feeding

PHYSICAL DATA

Calving period		May-Jun
Sale period		Aug-Nov
Herd life:	hinds (years)	12
	stags (years)	10
Calves born		90%
Calves reared		85%
Hind deaths (no.)		1
Liveweight at sale:	15-18 month stags (kg)	108
	15-18 month hinds (kg)	85
	cull hinds (kg)	110
Killing out percentage		54%
		/100 hinds
Stags (no.)		3
Sales:		
	15-18 month stags (no.)	43
	15-18 month hinds (no.)	35
	cull hinds (no.)	7
Winter feeding period (days):		
	hinds and stags	70
	calves	180
Feeding:	concentrates (t)	11.0
	silage (t)	161.2
Silage:	yield (t/ha from 2 cuts)	31
	ME quality (MJ/kg DM)	10
	fertiliser (kg N/ha)	220
Grazing	fertiliser (kg N/ha)	175
Total forage area required (ha)		
Silage and aftermath grazing		5.2
Grazing		13.0
		<hr/>
		18.2

Hay (3.8 ha at 7 t/ha) and swedes (1.7 ha at 75 t/ha) can be fed as an alternative to silage.

Housing system (straw bedding assumed):

Hinds housed January to April, calves housed November to April.

Straw bedding (t/hd)	- hinds and stags	0.10
	- calves	0.10
Antler sales	- kg per stag	5.50
	- kg per yearling	0.5
	- yearling antlers saleable	10%

Red Deer - Lowground Breeding and Feeding

GROSS MARGIN DATA

OUTPUT			£/100 hinds
Sale value (dwt):			
Stags	58 kg @	550 p/kg dwt	13,558
Hinds	45 kg @	550 p/kg dwt	8,784
Cull hinds	59.4 kg @	300 p/kg dwt	1,247
Antlers:	18.6 kg @	£10 /kg	186
			<u>23,775</u>
Less: hinds purchased			2,400
share of replacement stag			374
			<u>21,001</u>
VARIABLE COSTS			
Concentrates @ £210/t			2,319
Vet & medicines			631
Bedding straw @ £125/t (bought-in)			2,344
Other livestock expenses			2,685
			<u>7,979</u>
Gross Margin before forage			<u>13,022</u>
Forage variable costs:			
silage @ £317/ha			1,648
grazing @ £233/ha			3,029
			<u>4,677</u>
Total Variable Costs			<u>12,656</u>
GROSS MARGIN £/100 hinds			<u>8,345</u>
GROSS MARGIN £/ha			<u>459</u>

Sensitivity - Change ±	Change in Gross Margin/100 hinds (£)
£5/hd in all deer sales	425

Replacement cost prices:

Cull hind	£178	Hind (purch.)	£300
Cull stag	£136	Replacement stag	£1,500

Basis of data:

Sale price - slaughter price based on expected prices for sales to the abattoir. In practice, many deer farms sell part of their production direct to retailers, caterers and consumers at deadweight prices over £5.50/kg but with additional processing and marketing costs.

Red Deer - Upland Breeding Selling Calves

PHYSICAL DATA

Calving period		May-Jun
Sale period		Nov-Dec
Herd life:	hinds (years)	12
	stags (years)	10
Calves born		90%
Calves reared		85%
Hind deaths (no.)		1
Liveweight at sale:	stag calves (kg)	50
	hind calves (kg)	40
	cull hinds (kg)	110
Killing out percentage		54%
		/100 hinds
Stags (no.)		3
Sales:		
	stag calves (no.)	43
	hind calves (no.)	35
	cull hinds (no.)	7
Winter feeding period (days):		
	stags	70
	calves	150
Feeding:	concentrates (t)	9.9
	hay (t)	4.2
Hay:	yield (t/ha)	7
	ME quality (MJ/kg DM)	8.5
	fertiliser (kg N/ha)	125
Grazing	fertiliser (kg N/ha)	125
Total forage area required (ha)		
Hay and aftermath grazing		0.6
Grazing		10.0
		<hr/>
		10.6
Hill outrun		70.0
Housing system (straw bedding assumed):		
Hinds overwintered on hill, replacement calves housed November to April.		
Straw bedding (t/hd)	- hinds and stags	0.00
	- calves	0.10
Antler sales	- kg per stag	5.50

Red Deer - Upland Breeding Selling Calves

GROSS MARGIN DATA

OUTPUT			£/100 hinds
Sale value:			
Stag calves	50 kg @	260 p/kg lwt	5,525
Hind calves	40 kg @	240 p/kg lwt	3,407
Cull hinds	59.4 kg @	300 p/kg dwt	1,247
Antlers:	16.5 kg @	£10 /kg	165
			<u>10,344</u>
Less: hinds purchased			2,400
share of replacement stag			375
			<u>7,569</u>
VARIABLE COSTS			
Concentrates @ £380/t			3,753
Vet & medicines			670
Bedding straw @ £125/t (bought-in)			88
Other livestock expenses			2,685
			<u>7,196</u>
Gross Margin before forage			<u>373</u>
Forage variable costs:			
hay @ £280/ha			168
grazing @ £177/ha			1,770
			<u>1,938</u>
Total Variable Costs			<u>9,134</u>
GROSS MARGIN £/100 hinds			<u>-1,565</u>
GROSS MARGIN £/ha			<u>-148</u>

Sensitivity - Change ±	Change in Gross Margin/100 hinds (£)
£5/hd in all deer sales	425

Replacement cost prices:

Cull hind	£178	Hind (purch.)	£300
Cull stag	£136	Replacement stag	£1,500

Red Deer - Finishing Stag Calves

PHYSICAL DATA

Time of purchase		October
Sale period		Aug-Nov
Stags reared		97
Liveweight:	at purchase (kg)	50
	at sale (kg)	108
Killing out percentage		54%
Deadweight at sale (kg)		58
Mortality		3%
Liveweight gain (kg/day)		0.15
		/100 stags
Feeding:	concentrates (t)	7.3
	silage (t)	80.6
Silage:	yield (t/ha)	31
	ME quality (MJ/kg DM)	10
	fertiliser (kg N/ha)	220
Grazing	fertiliser (kg N/ha)	175
Total forage area required (ha)		
Silage and aftermath grazing		2.6
Grazing		5.5
		<hr/> 8.1
Hay (2.0 ha at 7 t/ha) and swedes (0.8 ha at 75 t/ha) can be fed as an alternative to silage.		
Housing system (straw bedding assumed):		
Calves housed November to April.		
Straw bedding (t/hd)	- calves	0.10
Antler sales	- kg per yearling	0.50
	- yearling antlers saleable	10%

Red Deer - Finishing Stag Calves

GROSS MARGIN DATA

OUTPUT			£/100 stags
Sale value:			
Finished stags	58 kg @	550 p/kg dwt	30,943
Antlers:	4.9 kg @	£10 /kg	49
			<u>30,992</u>
Less: calves purchased	50 kg @	260 p/kg lwt	13,000
			<u>17,992</u>
VARIABLE COSTS			
Concentrates @ £380/t			2,765
Vet & medicines			485
Bedding straw @ £125/t (bought-in)			1,213
Other livestock expenses			2,625
			<u>7,088</u>
Gross Margin before forage			<u>10,904</u>
Forage variable costs:			
silage@ £317/ha			728
grazing @ £233/ha			974
			<u>1,702</u>
Total Variable Costs			<u>8,790</u>
GROSS MARGIN £/100 stags			<u>9,202</u>
GROSS MARGIN £/ha			<u>1,136</u>

Sensitivity - Change ±	Change in Gross Margin/100 stags (£)
£5/hd in stag sales	485

Basis of data:

Sale price - slaughter price based on expected prices for sales to the abattoir. In practice many deer farms sell part of their production direct to retailers, caterers and consumers at deadweight prices over £5.50/kg but with additional processing and marketing costs.

Pigs

Introduction

Markets and prices

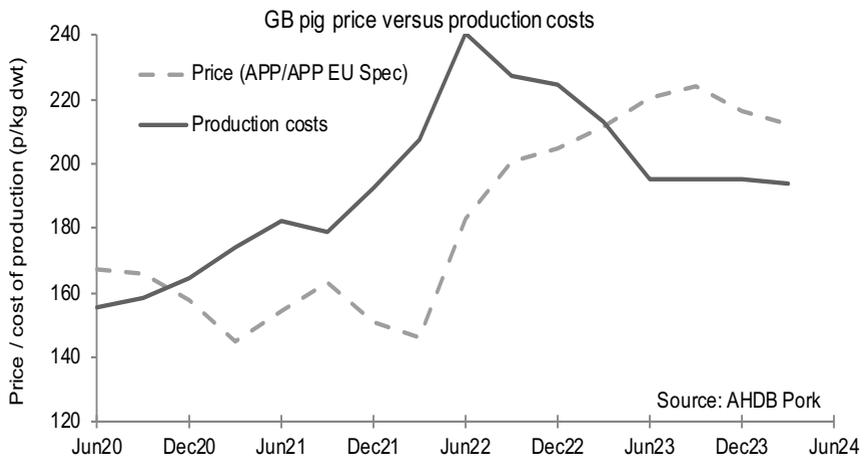
While pig prices have fallen back from the highs of twelve months ago, the last six months have been remarkable for the relative stability of the market, with prices remaining fairly constant along with feed prices and other inputs resulting in a period of sustained profitability albeit with lower margins than a year ago. This is a far cry from the roller-coaster nature of prices and margins historically associated with the pig industry. The pig sector in the UK and the EU has of course contracted significantly over the past few years and with little sign of numbers recovering, this has meant that for those producers remaining, there has been an opportunity to recover some of the losses made a few years ago and indeed start thinking about re-investing again.

The All Pigs Price (A.P.P.) EU Spec. started 2023 at just over 206p/kg before peaking at a record 225.42p/kg in mid-August before falling through the Autumn to just over 212p/kg at the turn of the year. Thereafter the price has hovered around this level and at the end of June 2024, was 212.65p/kg (AHDB). UK pig prices are influenced heavily by markets in the EU and while in the past this has kept a firm lid on the UK prices with cheaper EU pigmeat finding a ready outlet on UK supermarket shelves, the contraction of the EU pig herd has meant that prices in EU have also climbed significantly, lending support to UK prices. The prolonged period of sustained losses in the early 2020s saw a significant contraction in both the UK and EU breeding herds as producers left the sector. Brexit, Covid-19, and staff numbers have impacted the processing sector in recent years and this has led to a number of plants closing as the processing sector having also shrunk to fit the smaller UK pig herd. Slaughter weights continue to increase over time with average slaughter weights now typically around 88kg, this compares with 80kg in 2014. Despite this significant increase in weight, average P2 probes have only slightly gone up in that time.

With falling grain prices leading to a fall in producer costs in the first half of 2023, the last twelve months have seen costs (including feed) remain remarkably constant. The main cost in pig production is feed and in particular the main constituents wheat and barley. When grain prices reached their peak in summer 2022, feed costs represented 175p/kg of pig meat before falling sharply to 139p/kg and 123p/kg in Q1 and Q2 of 2023 respectively. Since then, feed prices have levelled off, estimated at 120p/kg in Q1 of 2024 (AHDB). Energy and labour costs have also increased over the past few years although like feed costs, have levelled off over the past 12 months. Labour has been a problem for a number of years and this has seen wages and salaries increase to both attract new staff to the sector and also retain existing stockpeople. Interest rates remain higher than they have been for some time, and this continues to impact on the sector with borrowings being stretched during the pig crisis

of the early 2020's, whereby the pig sector was estimated to have lost £750m cumulatively in that time.

After having been on a proverbial rollercoaster for a number of years, the latest published producer margins have been much more stable over the last 12 months (to Q1 2024) albeit falling slightly over that time (AHDB). At the start of 2020 producers were making a margin of £14/head (16p/kg). Despite prices continuing to increase through the summer, costs increased more rapidly, and with prices starting to fall in the autumn of 2020, margins quickly went from a positive to a negative of 6p/kg (£6 per pig) in the final quarter of 2020. A sharp drop in prices coupled with rising costs in early 2021 meant that producers were soon losing 29p/kg (£26/pig). By Q3 2021, these losses had reduced to 15p/kg as prices improved however this proved to be short-lived with the perfect storm of rapidly rising costs of production and falling pig prices, meaning producers were losing 61p/kg or £58 per finished pig by Q1 in 2022. Costs reached a peak of 240p/kg in Q2 of 2022, by which time prices received had started to recover with losses falling slightly to 58p/kg or £52 per pig. Since then, production costs fell to 213p/kg in Q1 of 2023 as pig meat prices had risen to 211p/kg resulting in a loss of 2p/kg or £1 per pig, meaning pig producers were almost breaking even for the first time in two and a half years. Pig prices then continued to rise for much of 2023 as costs continued to fall with producer margins reaching a peak of £25 per pig (28p/kg.) in Q3 of 2023. Since then pig prices have fallen back although still remain well above the costs of production which have been consistent over the past twelve months. The latest published margins show producers making £16 per pig or 18p/kg.



The December 2023 DEFRA census indicated a slight decline in the overall English breeding herd from 303,694 to 300,800, a reduction of 1% on the year, however this needs to be seen in the context that there were

7% and 21% declines recorded during 2021 and 2022 respectively, reflecting the severe challenges faced by the sector at the time. Further analysis revealed that within these figures that there were slight increases in terms of number of sows in pig (3.5%) however a 15% decrease in the number of gilts in pig. The December 2023 census also tempered some of the optimism following the June 2023 census which had suggested the beginning of a recovery in the English pig breeding herd. The pig crisis has also changed the profile of the industry with some of the larger producer/processors putting more sows on the ground suggesting that the proportion of the herd owned by independent producers is falling. In Scotland, sow numbers have also decreased over the past few years with the latest census data (June 2023) revealing the total breeding herd had fallen 7% to 31,100 pigs from the 5-year average (33,500). As has been the trend for several years, many pigs are born and weaned in Scotland before being moved to England for finishing and slaughtering.

Sow productivity continues to improve with indoor units seeing around 28 pigs weaned per sow per year on average (compared with 22.50 in 2010) with the top third now weaning 32 pigs per sow per annum. Litter size has driven this with numbers born alive increasing from 11.5 in 2010 to around 15 on average in 2024 with top third herds seeing 16 piglets born alive per litter. Outdoor herd performance also continues to improve in terms of productivity with numbers weaned per sow annually now around 26 (top third weaning 28 pigs per sow annually) compared to 21 in 2010.

In 2023 the UK was 58% self-sufficient in pig meat, a fall from 62.4% in 2022. As the UK breeding herd has significantly contracted in recent years, this has fed through to the number of finishing pigs, with 10.061 million clean pigs slaughtered in 2023 compared to 11.207 million in 2022 – a fall of 10.2%. Average slaughter weights were 89.1kg in 2023, and while this was slightly back on 2022 (90.1kg), it should be remembered that 2022 saw pigs kept on farm longer due to supply chain issues creating backlogs. The long-term trend has seen slaughter weights increase, rising nearly 9kg per carcass (11%) during the last decade. Unsurprisingly the fall in slaughterings also resulted in a fall in pig meat produced in the UK in 2023 with 927,400 tons produced compared to 1,046,300 tons in 2022, a fall of 11%. In context, there was almost 3% more pig meat produced in the UK than beef during 2023 and over 3 times more pig meat produced than lamb. UK domestic consumption figures decreased by 1% in 2023. While the strain on household budgets due to the cost-of-living crisis is mostly to blame, pig meat is well placed to benefit from consumers switching away from more expensive proteins (e.g. beef and lamb) although is under competition from cheaper chicken. Exports (including offal) dropped 20% in terms of volume in 2023, to 298,500 tons with a value of nearly £571m. The UK also imports a significant volume of product from a range of countries to fulfil the shortfall in domestic production and these decreased by 2.5% in 2023 to

781,780 tons. Most of these suppliers are from within the European Union with the biggest countries being the Netherlands and Denmark.

With UK product being seen by some markets as premium and the need to ensure maximum value from the carcass, the UK also exports a relatively large volume of lower value product with offal making up 45% of the export volume in 2023. Most exports of UK pig meat have been to the EU historically with 57% by volume going to the EU in 2023 although exports to other countries have been growing over time.

Marketing and processing

The UK pig industry is much more rationalised than other livestock sectors, such as beef and sheep with the supply chain for pigs more vertically integrated with contracts much more common. Most of the pigs finished in Scotland are also marketed through two producer co-operatives.

In Scotland, there has been an expansion in slaughtering capacity in recent years following the development of the plant at Brechin. Slaughtering of clean pigs in Scotland had been increasing up to 2020 however the disruption caused by Covid-19 and Brexit saw clean pig numbers decrease to 280,000, down 21% in 2021. Further consolidation and disruption saw slaughtering reduce further to 225,000 in 2022 with a further fall to a low of 212,000 in 2023. This is a far cry from the turn of the century when 750,000 clean pigs were slaughtered in Scotland annually. This means there is still a large number of finished Scottish pigs crossing the border to England for slaughter, in addition to the large number of weaners born and reared in Scotland before moving to England.

In 2018, Quality Meat Scotland launched '*Provenance and Profit – A strategy for Scotland's pig industry*'. The initiative aims to double the sector value by 2030. Quality Meat Scotland have also run successful marketing campaigns in recent years building on the "Specially Selected Pork" brand including "Go Places with Pork" in 2021 and in 2022, "Make it with Cred" to target a younger demographic, highlighting the health benefits and versatility of pork. June 2023 saw the launch of QMS's new five-year strategy which aims to make Scotland the choice for premium red meat with the Specially Selected Pork brand an integral part of this, along with Scotch Beef and Lamb, and this was followed up in 2024 with the "Make it scotch" campaign on social media and local radio.

Sector Summary

Feed is the biggest cost in pig production and typically accounts for 50-60% of overall costs and although this peaked at 73% in spring 2022 (AHDB) the latest published results (Q1 2024) show that feed has fallen to 62% of production costs. The profitability of pig production generally hinges on three factors; the price received for pigs, the feed price, and the efficiency of feed conversion. A more enduring route to profitability for pig producers is to raise the number of pigs reared per sow.

Significant gains have been achieved over the past 15 years with improved genetics leading to transformative increases in prolificacy and productivity. Fifteen years ago, the 2-ton sow seemed an almost impossible dream for the industry, now selling 3 tons of pigmeat per sow per year is just about within reach. Attention to detail is also a key element of pig production, and the use of management software and benchmarking is commonplace enabling managers to remove inefficiencies in the breeding herd such as improving the farrowing index and reducing the number of empty days. Health also plays a key role with producers working closely with their vets to monitor their own herds as well as working collaboratively to eliminate wider industry health issues with the announcement in July 2024 of funding from the Scottish Government for a national PRRS eradication scheme an example of this. If successful, this will help improve herd health across the country and ultimately further improve efficiency. The outlook for the sector in summer 2024 is one of cautious optimism and with profits being made again, re-investment is starting to take place to drive further production efficiencies, improve future business resilience, and improve environmental performance with an increasing focus on further reducing the carbon footprint of the sector. In 2021, the Scottish Pig Industry Leadership Group published “Bringing home the bacon” outlining its recommendations to the Scottish Government to support the sector towards achieving its emissions targets in future.

Breeding Pigs - Indoor Units

PHYSICAL DATA*

	4 week weaning	
	Average	Premium
Litters/sow/year (no)	2.23	2.30
Live pigs born/litter (no)	15.00	16.00
Piglet mortality (%)	14.00	12.00
Weaners/litter (no)	12.90	14.08
Pigs weaned/sow/annum**	28.77	32.38
Pigs sold/sow/annum	27.90	31.41
Age at weaning (days)		27.0
Age at sale/transfer (days)		75
Liveweight at weaning (kg)		7.50
Liveweight at sale (kg)		33.0
Sow:boar ratio		100
No. sows replaced annually (%)		55.0
No. boars replaced annually (%)		40
Sow mortality (%)		7.50
Feed use (conventional diets):		
sow meal (sow, boar, gilt) (kg)		1,425
Daily liveweight gain (g/day)		0.440
Feed conversion ratio (:1)		1.75
<i>Feed (kg of feed/sow/annum):</i>		
Creep feed (14 days of age to 9 kg lwt)	73	82
Weaner diet (9 to 15 kg lwt)	293	327
Rearing diet (15 to 34 kg lwt)	854	953
Total feed/sow/annum	2,645	2,786

* Based on data derived from AHDB Pork.

** Per sow and gilt in the herd, rounded and with an allowance for barreners.

Breeding Pigs - Indoor Units

GROSS MARGIN DATA

	£/sow/annum 4 week weaning	
	Average	Premium
OUTPUT		
Weaners sold @ £70*	1,953	2,199
Less:		
sow and boar replacement (net)	65	65
	<u>1,888</u>	<u>2,134</u>
VARIABLE COSTS		
Feed:		
sow meal @ £300/t	428	428
creep feed @ £875/t	64	71
weaner diet @ £500/t	146	163
rearing diet @ £375/t	320	357
Vet & medicines	32	33
Other livestock expenses	95	95
Total Variable Costs	<u>1,085</u>	<u>1,147</u>
GROSS MARGIN	<u>803</u>	<u>987</u>
Gross Margin/weaner sold	<u>28.78</u>	<u>31.42</u>

Sensitivity-Change ±	Change in Gross Margin/sow/annum (£)	
£1/weaner sold	28	31
1 weaner pig for sale	70	70
£5/t in feed prices	13	14

Replacement cost prices:

Cull sow (150 kg @ 100 p/kg dwt)	£150	Replacement gilt	£250
Cull boar (180 kg @ 80 p/kg dwt)	£144	Replacement boar	£1,000

* Weaners sold includes a 3% post weaning mortality.

Basis of data:

1. Feed cost is purchased feed, an estimate derived from quoted list prices.
2. Vet and medicine costs and other livestock expenses are SAC Consulting estimates.

Breeding Pigs - Outdoor Units

PHYSICAL DATA

	Average	Premium*
Breeding herd		
Stocking rate (sows/ha)	14	14
Litters/sow/year (no.)	2.23	2.30
Live pigs born/litter (no.)	13.3	13.8
Piglet mortality (%)	12.0	11.0
Weaners/litter (no.)	11.7	12.2
Pigs weaned/sow/annum	26.0	28.1
Weight at weaning (kg)	7.5	7.5
Age at weaning (days)	27.0	27.0
Proportion sows replaced annually (%)	45.0	45.0
Proportion boars replaced annually (%)	40	40
Sow mortality (%)	6.5	5.5
Sow:boar ratio (:1)	100	100
Sow feed used (kg/annum)	1,600	1,575
Weaners		
Post weaning mortality (%)	3.8	3.5
Weaners sold/sow	25.03	27.16
Age at sale/transfer (days)	75	75
Weight at sale (kg)	33.00	33.00
Weight gain (kg)	25.50	25.50
Daily liveweight gain (g/day)	450	475
Feed conversion ratio (:1)	1.80	1.75
Weaner feed (kg/weaner)	45.90	44.63

* Selected on pigs reared/sow/year.

Breeding Pigs - Outdoor Units

GROSS MARGIN DATA

	£/sow/annum	
	Average	Premium
OUTPUT		
Weaned pigs @ £70	1,752	1,901
Less: sow and boar replacement (net)	53	52
	<u>1,699</u>	<u>1,849</u>
VARIABLE COSTS		
Feed: sow cobs @ £315/t	504	496
weaner feed @ £500/t	597	628
Vet & medicines	32	32
Transport	32	32
Other livestock expenses	95	95
Total Variable Costs	<u>1,260</u>	<u>1,283</u>
GROSS MARGIN	<u>439</u>	<u>566</u>
GROSS MARGIN/weaner sold	<u>17.55</u>	<u>20.83</u>
GROSS MARGIN £/ha (acre)	<u>6,150</u> (2,489)	<u>7,922</u> (3,206)

Sensitivity-Change ±	Change in Gross Margin/sow/annum (£)	
£1/weaner sold	25	27
1 weaner pig for sale	70	70
£5/t in feed prices	- 9	- 8

Replacement cost prices:

Cull sow (150 kg @ 100 p/kg dwt)	£150	Replacement gilt	£250
Cull boar (180 kg @ 80 p/kg dwt)	£144	Replacement boar	£1,000

Note:

Sow costs are higher than indoor units due to the requirement for cob nuts for management purposes.

Finishing Pigs

PHYSICAL DATA

Type of finisher	All Average	Finishers Premium
Liveweight: at purchase/transfer (kg)	33.0	33.0
at slaughter (kg)	118.0	117.5
Deadweight: at slaughter (kg)	89.1	89.3
Killing out (%)	75.5	76
Mortality (%)	4.0	3.5
Liveweight gain (g/day)	885	929
Feed conversion ratio (:1)	3.00	2.78
Feed use (kg)	255	235
Days in herd	96	91
Sale price (p/kg dwt)	210	210
Feed price (£/t)	285	285

Finishing Pigs

GROSS MARGIN DATA

	£/hd	
	All Average	Finishers Premium
OUTPUT		
Sales	187.09	187.53
Less: weaner cost @ £70 (plus allowance for mortality)	72.80	72.45
	<hr/> 114.29	<hr/> 115.08
VARIABLE COSTS		
Feed	72.68	66.98
Vet & medicines	3.0	3.0
Other livestock expenses	12.00	12.00
Total Variable Costs	<hr/> 87.68	<hr/> 81.98
GROSS MARGIN	<hr/> 26.61	<hr/> 33.11
Sensitivity-Change ±		
1 p/kg dwt in sale price	0.89	0.89
£10/t in feed prices	2.55	2.35

Basis of data:

Other livestock expenses include deductions for power, water, bedding, haulage, commission and levies.

Poultry

Introduction

Up until recent months, the British poultry sector had been facing one of the most challenging periods in many years, with Avian Influenza (AI), spiralling production costs and squeezed prices threatening livelihoods of many producers. Thankfully, while AI continues to pose a threat, cases are much reduced, inflation shows signs of reduction, and producers have seen a 31% increase in prices (free-range) between December 2022 and December 2023. This is welcome news for the sector, which has seen a slowdown of businesses exiting production, and positivity about increasing output to meet strong consumer demand.

Changes to accreditation schemes and production standards are a main area of current debate in the sector, namely RSPCA laying hen standards and Lion accreditation. Industry bodies are pushing that changes to schemes are based on research evidence and consulted on with industry to ensure feasibility and sufficient time for adaptation. Following the announcement of enhanced RSPCA accreditation standards in November 2023, initial requirements for verandas have been put on hold pending further research, and other measures relaxed or phased in more slowly to reflect the scale of investment required. A recent survey by BFREPA highlighted issues with packers holding Lion accreditation, restricting producers' ability to switch contracts without losing certification. The same survey indicated that 89% of producers are part of Lion and 86% RSPCA Assured (see *The Ranger* for more information). This is one of various issues being explored in ongoing consultations by Defra into fairness in egg supply chains.

Despite voluntary commitments to cage-free egg production by 2025, specific details remain unclear. Alongside this pledge, Defra have announced consultation on a new tiered system of welfare labelling for the egg, broiler and pig sectors, which includes tiers equivalent to current cage production. The aims of this are to increase transparency of production standards to consumers, and better reward producers through markets. Further details are expected in coming months, and it would remain to be seen whether Scotland's labelling systems follow suit.

Chicken Egg Production

In 2023 the UK produced 936 million dozen eggs, bouncing back 7.6% from 2022 which saw the lowest production since 2016 (Defra, 2024). Free-range egg production rose 4.8% in 2023 from 2022 output, representing 59.8% of total production by the end of the year. This reflects progress towards the industry cage free target by 2025, with enriched and barn eggs now comprising 36.3% of total shell egg production. Organic production increased by 11.7%, now accounting for 3.8% of the total market. The table below shows egg production by system as a % of total egg production by year.

	1965	1980	2010	2023
Cage*	53%	95%	50%	23.4%
Barn	37%	4%	5%	12.9%
Free range	10%	1%	42%	59.8%
Organic	-	-	3%	3.8%

* enriched cages became a legal requirement for cage systems for laying hens in 2012.

Producers have also seen an increase to farmgate egg prices through 2023, from a free-range price of 114.6p/d in Q4 2022 to 150.7p/d in Q4 2023, representing a welcome 31% increase. This follows a period of rising input costs exceeding price rises from packers.

Independent egg producers can sell their eggs via the large egg producers/packers, or through local businesses (e.g. hotels, farmer's markets). Flock size and thus scale of egg output will probably govern which route an egg producer favours. See page 116 for information on poultry keeping regulations.

Egg grading

Egg grading percentages are dependent on a large number of variables, e.g., lighting programmes and feed specifications and can be altered by changing the feeding and lighting during rearing and the feed specifications during lay. Most major breed management manuals provide suitable information. The following table shows the egg grading ratios as a percentage with weight for each grade.

	Ratio	Grade A weight
Very large	2.0%	>73g
Large	43.0%	63-72.99g
Medium	45.0%	53-62.99g
Small	3.0%	<53g
Seconds	6.0%	-

Egg price indicators

	Pence per 6 pack			
	<i>Very large</i>	<i>Large</i>	<i>Medium</i>	<i>Mixed weight</i>
Cage	-	119	-	82
Barn	-	-	-	-
Free range	256	203	145	140
Organic	375	305	267	252

Source: Leading supermarkets average price for standard 6 packs (June 2024).

Quality assurance

The predominant and most recognised hen egg assurance scheme is the British Lion Quality Code of Practice, which covers 90% of UK egg production. For more information, see <http://www.egginfo.co.uk/>.

For updates on changes to the Code of Practice for Lion Quality eggs visit the British Egg Industry Council website at: www.britisheggindustryCouncil.com

Other assurance schemes, such as Freedom Foods free range egg production, or Soil Association organic egg production, can be found at:

- www.freedomfood.co.uk/industry/rspca-welfare-standards
- www.soilassociation.org/farmersgrowers/technicalinformation/poultrylaying

Broiler Meat Production

The UK produced 1.79 million tonnes of broiler chicken meat in 2023, an increase of 0.4% from 2022. With an increase in broiler placings of just 0.2%, the statistics suggest that broiler production has stabilised in the 3 years. This is in contrast to layer production, which saw contraction in 2021-22, but is beginning to expand again.

Most broiler chickens are reared conventionally, with free range and organic production accounting for about 5% of the market. Conventional rearing typically means in light-controlled houses but providing natural daylight through windows (along with other types of environmental enrichment, such as perches and bales of wood shavings/straw) is becoming increasingly popular. Both male and female broiler chicks grow rapidly, so either or both sexes can be reared, depending on what target slaughter weight is desirable. With conventional rearing, the average liveweight at the point of slaughter (at around 36-40 days of age) is 2.2 kg (Defra 2020b).

Legislation governing the keeping of conventionally reared broiler chickens (Council Directive 2007/43/EC) stipulates the maximum stocking densities allowed but note that the UK does not permit the highest stocking density of >39-42 kg/m² (Defra 2011). For more information on housing space requirements see page 407.

Many broiler producers sell their produce under the Assured Chicken Production scheme, which is part of the Red Tractor farm assurance scheme, to ensure food safety and traceability. For more information, see <https://assurance.redtractor.org.uk/standards>

Useful Poultry References

- British Poultry Council (BPC): www.britishpoultry.org.uk/
- BFREPA (British Free Range Egg Producers' Association) – www.bfrepa.co.uk & www.theranger.co.uk
- USDA 2019, Livestock and Poultry: World Markets and Trade.
- Council Directive 1999/74/EC Laying down minimum standards for the protection of laying hens, pp1-5.
- Council Directive 2007/43/EC Laying down minimum rules for the protection of chickens kept for meat production, pp1-10.
- Defra 2011 Interim guidance for keepers of conventionally reared meat chickens: www.gov.uk/government/publications/meat-chicken-keeper-guidance
- Defra 2022. United Kingdom Egg Statistics: www.gov.uk/government/statistics/egg-statistics.
- Defra 2022b. United Kingdom Poultry and Poultry Meat Statistics: www.gov.uk/government/statistics/poultry-and-poultry-meat-statistics
- <https://www2.gov.scot/Topics/farmingrural/Agriculture/Livestock/eggs>

Laying Hens - Free Range

PHYSICAL DATA

Source: Hyline Brown Management Guide 2019
Egg stock Brown

Body weight at 17 weeks (kg)	1.40-1.48
Body weight at 70 weeks (kg)	1.91-2.03
Age at 50% production (age, weeks)	20
Peak production (%)	95-96

Laying period:

Pullets housed (weeks)	17
Pullets point of lay (weeks)	18
Weeks in lay per annum adjusted for downtime	48.5
Bird laying cycle (week 18 to 72) (eggs)	319-330
Adjusted egg production (bird/annum) *	272

Mortality:

Livability during lay (%) - refer to breed management guides	0.97
Stocking density (birds/ha)	2,500

Feed:

Feed use (16 to 18 weeks) (kg/hd)	1.10
Feed use (19 to 72 weeks) (kg/hd)	41.664

* Adjusted for 365d, mortality, downtime (pullet to lay, washing)

Note:

Other bird expenses include veterinary treatments, disinfectants, litter, dead bird disposal and range maintenance.

Laying Hens - Free Range

GROSS MARGIN DATA

	£/1000 bird/annum Wholesale	£/doz Wholesale
OUTPUT	£	£
Eggs sales @ £1.523/doz	34,536	1.52
Old hen value less catching cost	181	0.01
Less:		
Pullet purchase @ £5.43 per bird	5,430	0.24
	<u>29,287</u>	<u>1.29</u>
VARIABLE COSTS		
Concentrate feed purchased @ £320/t	12,061	0.53
Other bird expenses	8,152	0.38
Total Variable Costs	<u>20,213</u>	<u>0.91</u>
GROSS MARGIN	<u>9,074</u>	<u>0.38</u>

Sensitivity ±	Change in Gross Margin/1000 birds/annum (£)
£0.10/doz eggs sold	2,268
£10/t feed	377
1% increase in mortality at point of lay (£/1000 birds)	91

Basis of data:

1. Egg price based on BFREPA UK average packer to producer free range price, as at June 2024.
2. High numbers of second grade eggs may be penalised and devalue the average price received.
3. Pullet price based on estimated BFREPA price (16 week fully vaccinated 3,000 bird order), June 2024.
4. Producers selling direct to market will incur additional packaging, grading and marketing costs as well as increased transport, labour and administration costs.

Grading, packaging and marketing costs vary significantly from business to business depending on the degree of automation, the size of the packing operation and the requirements of the customer being supplied.

Organic Farming

Introduction

In 2023 the area of organic farmland in the UK decreased by % to 497,900ha from 508,600ha in 2022. This is mainly due to a reduction in organic grassland and a reduced in conversion area. The organic land area decreased steadily from a high of 743,500ha in 2008 to a low of 474,000ha in 2018 and grew steadily again up to 508,600ha before this contraction in area in 2023. The area of organic land in the UK now covers 2.9%. In contrast, organic production in Europe has continued to grow and now covers 16.9 million hectares from 9.5 million hectares in 2012, and now covers 10.5% of farmland.

The area of land used for organic farming in Scotland in 2023 was 116,600ha; and this has increased from 110,900ha in 2022 and represents 2.3% of Scottish farmland. The area of in-conversion land has however decreased to 13,100ha from a recent high of 18,400ha in 2022.

Organic cattle and sheep numbers have reduced by 2.75% & 5.78% respectively. Pig numbers have also reduced with a 35% contraction in numbers, but poultry has increased significantly by 19.1% (mainly due to broiler numbers increasing). Other livestock (goats, deer, and horses) have remained fairly static, but deer numbers have increased as goat and horse numbers reduced.

Total organic food sales in the UK increased by 2.0% during 2023, creating a market worth £3.2 billion. Organic produce makes up approximately 1.3% of the UK food and drink sector.

At farm level, the organic milk price premium is generally around 10ppl premium on conventional milk. The finished beef price trend has generally followed the conventional price, with an organic premium of approximately 40 - 60p/kg. The premium for organic lamb remains small at peak sale season in the autumn, but outwith this period, premiums are usually available (30-60p/kg).

Prices for organic cereals, remain strong, with premiums of approximately £100 - £150/t for organic cereals, but this is dependent on price and availability of imported organic cereals.

Why farm organically?

Organic farming seeks to work with natural biological systems to produce high quality food in an environmentally sustainable way that minimises damage to the environment and wildlife. This enables organic produce to attract a price premium.

Organic farming systems exclude the use of agrochemicals and synthetic fertilisers, and generally have low input systems with lower variable costs, which combined with price premiums have the potential to create profitable businesses where enterprise output can be maintained.

In Scotland, organic farming has been supported under the Agri-environment Climate Scheme (AECS) of the Rural Development Programme. Attractive rates have been available for both organic conversion and maintenance funding as shown in the following table.

£/ha	Year 1 Conversion	Year 2 Conversion	Year 3 Maintenance	Year 4 Maintenance	Year 5 Maintenance
Arable	280	280	65	65	65
Fruit/veg	400	400	200	200	200
Improved grass	140	140	55	55	55
Rough grazing	12.50	12.50	8.50	8.50	8.50

The first two years of organic conversion payments are higher than the latter three years where maintenance rates apply. This is to compensate for lower output during the conversion period before organic premiums can be attained.

Land that is managed organically is exempt from all Greening requirements of the Basic Payment Scheme (BPS) (see the Rural Aid Schemes section on page 468).

The principles of organic farming also accord with the ethos of many land managers. Using clover and livestock manures to provide fertility, the promotion of health rather than treatment of disease, and an 'acceptable' weed burden that provides food for birds and pollinating species are the aims of some land managers. Going through the formal process of certification allows produce to be sold as organic, and so receive a price premium.

How to get into organic farming

Some farm businesses require big changes to their systems in order to convert, while others will require little change. It is worth talking through the implications of converting with an adviser. Many organisations run organic farm walks throughout the year, giving farmers the chance to visit an organic farm which will demonstrate the link between organic farming and good environmental management.

There are several different organic bodies that provide certification (details on page 247). The choice of certification body can depend on several factors, including cost and the enterprises operated on the farm. Grant funding is available for farmers, and it is advisable that this is secured before conversion.

Organic conversion

Converting to organic farming will require changes in farm management with emphasis on increasing a farm's self-reliance: growing most of its own livestock feed; recycling nutrients through manure management; and using ley phases with a lot of clover to fix nitrogen, and which helps to provide fertility for arable crops later in the rotation. As well as building fertility, crop rotations also provide clean grazing and help manage the

weed burden. The requirement for more 'natural' production restricts the amount of concentrates that can be fed to cattle and sheep, emphasising a forage-based system. Housed livestock have maximum stocking densities, and must also have a dedicated lying area, possibly necessitating changes to housing with existing slatted floors.

Technical information

The data used in the preparation of the gross margins overleaf has been a necessary compromise of organic production figures from across Scotland. This should be borne in mind when using the margins, for example, in areas where straw is difficult to source a much higher price should be allocated to bedding.

Silage yield is based on a lower yielding, two cut system. Where yields are high due to a large clover yield in a year with an early spring, this should be increased. If only one cut is taken and yields are lower, then the forage area will have to be adjusted accordingly. Silage costs are based on baling and wrapping a third of the silage produced. This cost will increase or decrease depending on the proportion of pit or baled silage.

Organic certification

Any farmer wishing to produce food for sale as organic must comply with regulations setting out the minimum standards of production. Certification bodies have their own standards which are generally more specific, and in some respects stricter than the basic EU standards. All farmers in the UK are certified to this higher level.

The number of licenced producers and processors in Scotland has decreased to 521 in 2023 from 528 in 2022. The number of producers has stayed similar to last year at 379, with a reduction in the number of processors. The number of crop producers rose from 350 in 2022 to 362 in 2023 but livestock producers have decreased from 269 to 267 over the same timeframe. Mixed farm holdings however are recorded under both crop and livestock, hence numbers do not correlate to the number of producers.

Organic Farming Contacts

Certification bodies

Scottish Organic Producers Association (SOPA)	0300 772 9795 info@sopa.org.uk
The Biodynamic Association (BDA)	01453 759 501 office@biodynamic.org.uk
Organic Farmers and Growers (OF&G)	01939 291 800 info@ofgorganic.org
Irish Organic Association (IOA)	+353 090 643 3680 info@irishoa.ie
The Organic Food Federation	01760 720 444 info@orgfoodfed.com
Organic Trust Ltd.	+ 353 (0) 185 30271 organic@iol.ie
Quality Welsh Food Certification Ltd. (QWFC)	01970 636 688 enquiries@qwfc.co.uk
Soil Association Certification Ltd.	England: 0117 914 2411 Scotland: 0131 370 8150

Information and advice

SAC Consulting	01467 625385
Organic Advice, Support & Information Service	0844 800 0091 advice@organicinfo.org.uk

Organic Wheat - Winter

PHYSICAL DATA

(a) Seed

Organic seed sown at 200 kg/ha (1.60 cwt/acre).

(b) Fertiliser

No manure or mineral fertiliser applied routinely to first crop after ley. Annualised cost of rock phosphate and permitted potash fertiliser (e.g. sulphate of potash) after derogation.

(c) Trace elements

Trace elements (e.g. manganese sulphate).

(d) Other crop expenses

Net wrap at £1.10/bale for round straw bales.

Organic Wheat - Winter

GROSS MARGIN DATA

Grain yield: t/ha (t/acre)	4.0	(1.6)	5.3	(2.1)	6.5	(2.6)
Straw yield: t/ha (t/acre)	2.1	(0.9)	2.8	(1.1)	3.4	(1.4)
OUTPUT			£/ha (acre)			
Grain @ £270/t*	1,080		1,431		1,755	
Straw @ £60/t	127		169		207	
	<u>1,207</u>	(488)	<u>1,600</u>	(648)	<u>1,962</u>	(794)
VARIABLE COSTS						
Seed @ £725/t	145		145		145	
Fertiliser	46		46		46	
Trace elements	10		10		10	
Other crop expenses	15		19		24	
	<u>216</u>	(87)	<u>220</u>	(89)	<u>225</u>	(91)
GROSS MARGIN	<u>991</u>	(401)	<u>1,380</u>	(558)	<u>1,737</u>	(703)

GRAIN PRICE SENSITIVITY

£250 /t	911	(369)	1,274	(516)	1,607	(650)
£290 /t	1,071	(433)	1,486	(601)	1,867	(756)
£310 /t	1,151	(466)	1,592	(644)	1,997	(808)

* Feed price (milling premium £30/t)

Basis of data:

Sale price estimate for 2025 crop, September/October ex-farm spot price at 15% moisture content and average quality.

Organic Oats - Spring

PHYSICAL DATA

(a) Seed

Organic seed sown at 200 kg/ha (1.60 cwt/acre).

(b) Fertiliser

No manure or mineral fertiliser applied routinely to first crop after ley. Manure applied to 2nd and 3rd crop after ley. Annualised cost of rock phosphate and permitted potash fertiliser (e.g. sulphate of potash) after derogation.

(c) Trace elements

Trace elements (e.g. manganese sulphate).

(d) Other crop expenses

Net wrap at £1.10/bale for round straw bales.

Organic Oats - Spring

GROSS MARGIN DATA

Grain yield: t/ha (t/acre)	3.0	(1.2)	4.0	(1.6)	5.0	(2.0)
Straw yield: t/ha (t/acre)	1.8	(0.7)	2.4	(1.0)	3.0	(1.2)
OUTPUT			£/ha (acre)			
Grain @ £280/t*	840		1,120		1,400	
Straw @ £60/t	108		144		180	
	<u>948</u>	(384)	<u>1,264</u>	(512)	<u>1,580</u>	(639)
VARIABLE COSTS						
Seed @ £650/t	130		130		130	
Fertiliser	46		46		46	
Trace elements	10		10		10	
Other crop expenses	12		17		21	
	<u>198</u>	(80)	<u>203</u>	(82)	<u>207</u>	(84)
GROSS MARGIN	<u>750</u>	(303)	<u>1,062</u>	(430)	<u>1,373</u>	(556)

GRAIN PRICE SENSITIVITY

£260 /t	690	(279)	982	(397)	1,273	(515)
£300 /t	810	(328)	1,142	(462)	1,473	(596)
£320 /t	870	(352)	1,222	(495)	1,573	(637)

* Milling price (feed price £30/t lower)

Basis of data:

Sale price - estimate for 2025 crop, September/October ex-farm spot price at 15% moisture content and average quality.

Organic Barley - Spring

PHYSICAL DATA

(a) Seed

Seed sown at 200 kg/ha (1.6 cwt/acre).

(b) Fertiliser

No manure or mineral fertiliser applied routinely to first crop after ley. Manure applied to 2nd and 3rd crop after ley. Annualised cost of rock phosphate and permitted potash fertiliser (e.g. sulphate of potash) after derogation.

(c) Trace elements

Trace elements (e.g. manganese sulphate).

Organic Barley - Spring

GROSS MARGIN DATA

Grain yield: t/ha (t/acre)	3.0	(1.2)	4.0	(1.6)	5.0	(2.0)
Straw yield: t/ha (t/acre)	1.6	(0.6)	2.1	(0.9)	2.7	(1.1)
OUTPUT			£/ha (acre)			
Grain @ £250/t*	750		1,000		1,250	
Straw @ £70/t	111		148		186	
	<u>861</u>	(348)	<u>1,148</u>	(465)	<u>1,436</u>	(581)
VARIABLE COSTS						
Seed @ £650/t	130		130		130	
Fertiliser	46		46		46	
Trace elements	10		10		10	
Other crop expenses	11		15		18	
	<u>197</u>	(80)	<u>201</u>	(81)	<u>204</u>	(83)
GROSS MARGIN	<u>664</u>	(269)	<u>947</u>	(383)	<u>1,232</u>	(498)

GRAIN PRICE SENSITIVITY

£230 /t	604	(244)	867	(351)	1,132	(458)
£270 /t	724	(293)	1,027	(416)	1,332	(539)
£290 /t	784	(317)	1,107	(448)	1,432	(580)

* Feed price (malting premium £30/t)

Basis of data:

Sale price estimate for 2025 crop.

Organic Beans - Spring

PHYSICAL DATA

(a) Seed

Seed sown at 225 kg/ha (1.8 cwt/acre).

(b) Fertiliser

No manure or mineral fertiliser applied routinely to first crop after ley. Manure applied to 2nd and 3rd crop after ley. Annualised cost rock phosphate and permitted potash fertiliser (e.g. sulphate of potash) after derogation.

(c) Trace elements

Trace elements (e.g. manganese sulphate).

Organic Beans - Spring

GROSS MARGIN DATA

Grain yield: t/ha (t/acre)	3.0	(1.2)	5.0	(2.0)
OUTPUT			£/ha (acre)	
Grain @ £400/t*	<u>1,200</u>		<u>2,000</u>	
	<u>1,200</u>	(486)	<u>2,000</u>	(809)
VARIABLE COSTS				
Seed @ £725/t	181		181	
Fertiliser	46		46	
Trace elements	10		10	
Other crop expenses	-		-	
	<u>237</u>	(96)	<u>237</u>	(96)
GROSS MARGIN	<u>963</u>	(390)	<u>1,763</u>	(713)

GRAIN PRICE SENSITIVITY

£360 /t	843	(341)	1,563	(633)
£440 /t	1,083	(438)	1,963	(794)
£460 /t	1,143	(463)	2,063	(835)

* Feed price

Basis of data:

Sale price estimate for 2025 crop. Deductions for high levels of field beans which do not meet minimum quality standards can reduce the price considerably.

Organic Potatoes - Maincrop

PHYSICAL DATA

(a) Seed

Planted at 2.5 t/ha. This figure can rise to 4 t/ha depending on seed size. Organic seed must be used unless a derogation is obtained for specialist varieties.

(b) Fertiliser

Farm yard manure used, no artificial fertiliser.

(c) Sprays

Seed treatment None.

Nematicide Assumption of no treatment applied.

Herbicides None used.

Blight control None used.

Aphid control None used.

Slug control 2 applications of ferric phosphate (derogation obtainable) for high risk situations. If low risk situation (i.e. sandy soils), reduce cost by £43/ha.

Desiccation Pulverising and/or gas burning. See page 381 for costs.

(d) Other crop expenses

SPCS field inspection fees; roguing and labels and positive ventilation and cold storage are included. Other costs may include bags (£7.50-£11.20/t of crop) and royalties (which will depend on variety).

(e) Irrigation

Irrigation may be applied in some circumstances for yield and quality. These costs are not included. Annual capital charge could be £350-500/ha plus £1.60-1.90/ha.mm with a contract charge of approximately £5.40/ha.mm.

(f) Casual labour

These costs are not included. Costs calculated using the data below could be used. Labour charged at £15/hr as per labour rates on page 60 for low yielding potato crops.

Organic Potatoes - Maincrop

GROSS MARGIN DATA

Yield: t/ha (t/acre): seed	17	(6.9)	17	(6.9)
Yield: t/ha (t/acre): ware	15	(6.1)	22	(8.9)
Yield: t/ha (t/acre): s/feed	6	(2.4)	6	(2.4)
	<u>38</u>	(15.4)	<u>45</u>	(18.2)
OUTPUT			£/ha (acre)	
Seed @ £415/t	7,055		7,055	
Ware @ £380/t	5,700		8,360	
Stockfeed @ £30/t	180		180	
	<u>12,935</u>	(5,235)	<u>15,595</u>	(6,311)
VARIABLE COSTS				
Seed @ £375/t	938		938	
Fertiliser	-		-	
Sprays	40		40	
Other expenses	2,892		3,403	
	<u>3,870</u>	(1,566)	<u>4,381</u>	(1,773)
GROSS MARGIN	<u>9,065</u>	(3,669)	<u>11,214</u>	(4,538)
WARE PRICE SENSITIVITY				
£150 /t	5,615	(2,272)	6,154	(2,490)
£250 /t	7,115	(2,879)	8,354	(3,381)
£310 /t	8,015	(3,244)	9,674	(3,915)
£360 /t	8,765	(3,547)	10,774	(4,360)

Organic Dairying

Introduction

Organic dairy farming aims for self-sufficiency within a unit. An effective way of doing this is by utilising high quality grass and grass silage as the main source of both protein and energy to maximise milk from forage. This achieves economies in concentrate feeding. Further economies can be made by growing more protein on the farm such as peas and beans and increasing the use of both red and white clover in grass leys to reduce bought-in protein costs. Replacing compound feeds and blends with home mixes will help reduce feed costs further. The higher reliance on forage means that milk output is around 20% lower than in a conventional system.

Gross margins

The enterprise performance level is specific to the individual cow per annum based on the whole herd performance divided by the average number of cows in the herd. This allows for a number of variables, but also contains a number of constant assumptions.

Variables

Feeding systems can vary greatly depending on yield with the simplest system being silage or grass ad-lib with parlour cake fed to yield. Higher input systems may make use of a partial mixed ration with a low level of concentrate fed along with silage and other forages, again topped up with feeding in the parlour or robot. Total mixed rations may also be fed without additional parlour feed. Organic concentrate costs are significantly higher, in the region of about 50-70% over conventional feeds. Whatever the system, forage inclusion must be a minimum 60% of the total ration on a dry matter basis. It is a requirement of the organic certification standards that dairy cows must be at pasture when conditions allow, which is typically over 200 days on average per year.

Constant assumptions

Herd life	3 to 5 years
Calving interval	380 days
Cow mortality	5%
Calf mortality (up to 7 days)	7%
Size of cow	600 kg
Winter feeding period	180 days

Rations

For simplicity the feeds included have been restricted to ad-lib silage (when housed) or grass plus an 18% crude protein (fresh weight), 13.0 MJ ME/kg DM compound cake.

Organic Dairying - Summary of Assumptions

(a) Average price assumed (ppl)

An average price of 52ppl is assumed. This will fluctuate seasonally and will be dependent on quality characteristics such as hygiene measures and milk fat and protein percentage.

(b) Calf value

A sale/transfer price of £166/hd has been adjusted for calving interval and mortality. The calf value can be altered by £8.61 for each £10 difference in the sale/transfer price.

(c) Cull cow (annual share)

A sale price of £707.00/hd has been adjusted for herd life and mortality, and assumes no variation between high and low yielding cows. The annual share can be altered by £2.34 for each £10 difference in cull cow price. Assumed herd life of 4.17 years.

(d) Heifer replacement (annual share)

Heifer purchase/transfer price varies according to yield. A purchase price equating 18ppl has been used, here, and this has been adjusted for herd life and mortality. The annual share can be altered by £2.45 for each £10 difference in purchase/transfer price.

(e) Other livestock expenses

These are taken from commercial dairy herds and include milk recording, bedding sawdust, dairy detergents, and feeding straw.

Organic Dairy Cow - 7,000 Litres

PHYSICAL DATA

Calving period	All year
	/cow
Average annual yield (litres)	7,000
Feed requirements (kg)	
Silage (kg)	7,700
Concentrates (kg)	1,800
Concentrates fed per litre (kg)	0.26
Overall forage area (ha)	
Silage and aftermath grazing	0.25
Grazing	0.34
Total	<u>0.59</u>

Basis of data:

See *Summary of assumptions-physical data*, page 258-259.

Organic Dairy Cow - 7,000 Litres

GROSS MARGIN DATA

Calving period	All year
	/cow
Average annual yield (litres)	7,000
OUTPUT	£
All year milk @ 52 p/litre	3,640
Calf value	143
Cull cow (annual share)	197
	<hr/>
	3,980
Less: Heifer replacement (annual share)	314
	<hr/>
	3,666
VARIABLE COSTS	
Concentrates @ £550/t	990
AI	55
Vet & medicines	89
Other livestock expenses	100
	<hr/>
	1,234
	<hr/>
Gross margin before forage	2,431
Forage variable costs:	
Silage @ £84/ha	21
Grazing @ £84/ha	29
	<hr/>
Total Variable costs	1,284
	<hr/>
GROSS MARGIN £/cow	2,381
	<hr/>
GROSS MARGIN £/ha	4,036
	<hr/>

Sensitivity-Change ±

1 p/litre in milk price	70
£10/t in concentrate price	18

Organic Suckler Cows - Mainly Silage Diets

PHYSICAL DATA

Breed:	Commercial type cows bred to a range of bulls, mostly continental
Calving period	Feb-Apr
Calves weaned (%)	92
Month of weaning	October
Days to weaning	220
Month of sale	October
Liveweight of calves at sale	
Steers (kg)	260
Heifers (kg)	240
Herd life of cows (years)	7
Herd life of bulls (years)	4
Cow mortality (%)	2
Calf mortality (%)	3
Cow:bull ratio (:1)	35
Feeding/cow and calf (winter days):	180
silage (t)	6
calf concentrates (kg)	180
cow concentrates (kg)	-
Straw (t)	0.9
Silage:	
yield	30 t/ha from 2 cuts;
quality	DM 220 g/kg; ME 10.5 MJ/kg DM
Overall forage area (ha)	
silage and aftermath grazing	0.20
grazing	0.45
	<hr/>
	0.65

Assumptions:

Mainly grass farm either buying in all straw and concentrates or growing small amount of cereals.

Note:

1. SSBSS based on 94% calves claimed. See pages 151 and 474 for more details.

Organic Suckler Cows - Mainly Silage Diets

GROSS MARGIN DATA

Calving period	Feb-Apr	
OUTPUT	£/cow	
Calf sales (lwt - 92% crop)		
Steers		
260 kg @ 300p		690
Heifers		
240 kg @ 300p		99
Scottish Suckler Beef Support Scheme		789
		<hr/>
Less: Replacement - cow		88
bull		26
		<hr/>
		675
VARIABLE COSTS		
Barley @ £250/t		45
Minerals		15
Vet & medicines		39
Straw - feeding & bedding @ £125/t (bought-in)		113
Commission, tags & levies		34
		<hr/>
		246
		<hr/>
Gross Margin before forage		429
Forage variable costs:		
silage @ £84/ha		17
grazing @ £84/ha		38
		<hr/>
		55
		<hr/>
Total Variable Costs		301
		<hr/>
GROSS MARGIN £/cow		374
		<hr/>
GROSS MARGIN £/ forage ha (acre)		575 (233)

Sensitivity-Change ±

10 p/kg in lwt sale price	23
Sale weight ± 10kg	28
Herd life ± 1 year	18

Replacement cost prices:

Cull cow	£900	In-calf heifer (purch.)	£1,450
Cull bull	£1,150	Replacement bull	£4,750

Organic Finishing Cattle

PHYSICAL DATA

Liveweight at purchase (kg)	250
Liveweight at slaughter:	
kg lwt	580
kg dwt	320
Cattle bought	October
Cattle sold	January
Finishing period (days)	440
Liveweight gain (kg)	330
Daily liveweight gain (kg)	0.75
Supplementary feed-barley, protein & minerals (kg)	700
Straw (t)	0.8
Overall forage area (ha)	
silage and aftermath grazing	0.22
grazing	0.25
	<hr/>
	0.47
	<hr/>

Organic Finishing Cattle

GROSS MARGIN DATA

OUTPUT	£/head	
Sale value (dwt):		
320 kg @ 585p	1,872	
Less: Purchased store calf in October (lwt)		
250 kg @ 300p	<u>750</u>	
	<u>1122</u>	
VARIABLE COSTS		
Barley, protein & minerals @ £360/t	252	
Vet & medicines	18	
Straw - feeding & bedding @ £125/t (bought-in)	100	
Commission, tags & levies	<u>65</u>	
	<u>435</u>	
Gross Margin before forage	<u>687</u>	
Forage variable costs:		
silage @ £84/ha	18	
grazing @ £84/ha	<u>21</u>	
	<u>39</u>	
Total Variable Costs	<u>474</u>	
GROSS MARGIN £/head	<u>648</u>	
GROSS MARGIN £/ha (acre)	<u>1,380</u>	(558)
Sensitivity-Change ±		
10 p/kg in dwt sale price	32	
Dwt sale weight ± 10kg	59	

Organic Breeding Ewes - Finished Lamb Production

PHYSICAL DATA

Breeds	Crossbred ewe to terminal sire
Lambing period	April/May
Lamb crops per ewe (avg)	4
Ram flock life (seasons)	3
	/100 ewes tupped
Rams (no.)	2.5
Lamb numbers: marked	150
mortalities	5
sold finished	145
Lamb lwt at slaughter (kg)	42
Lamb dwt at slaughter (kg)	20
Ewes: culls	20
mortalities	5
gimmers purchased	25
Wool sales (kg)	272
Concentrate use: barley/mineral (kg)	2,000
Total concentrate (kg)	2,000
Forage (ha): silage	1
grazing	12
Total forage (ha)	13

Basis of data:

1. Silage yield and quality 30 t/ha from 2 cuts; ME 10.5 MJ/kg DM.
2. Breeding stock and finished lamb prices 2024/25 season.

Organic Breeding Ewes - Finished Lamb Production

GROSS MARGIN DATA

OUTPUT	£/100 ewes tugged	
Finished lambs: 145 @ £132/hd	19,140	
Cast ewes: 20 @ £93/hd	1,860	
Wool sales: 272kg @ £1/kg	272	
	<u>21,272</u>	
Less: 25 gimmers purchased @ £190/hd	4,750	
ram replacement (net)	375	
	<u>16,147</u>	
VARIABLE COSTS		
Cereals & minerals @ £450/t	900	
Vet, medicines & dips	554	
Commission, levies, shearing, scanning & tags	1,333	
Gross margin before forage	<u>13,360</u>	
Forage variable costs:		
1 ha silage @ £84/ha	84	
12 ha grazing @ £84/ha	1,008	
Total Variable Costs	<u>3,879</u>	
GROSS MARGIN	<u>12,268</u>	
GROSS MARGIN £/ forage ha (acre)	<u>944</u>	(382)
Sensitivity-Change ± Change in Gross Margin/100 ewes (£)		
£1/hd in finished lamb price	145	
£1/hd in draft ewe price	20	
5% change in lambs sold	957	

Crofts and Small Farms

Introduction

This section gives an overview of crofting and small farms.

Information on crofting and land tenure and legislation is included as well as information on support schemes specifically directed to crofts and small farms.

For new entrants to farming, this section should be read in conjunction with the New Entrant section on page 427.

Crofting

Crofting is a form of land tenure which is unique to Scotland. Generally, a croft is a relatively small agricultural land holding which is normally held in tenancy and which may or may not have buildings or a house associated with it. Crofts are only found within the crofting counties of Scotland, in the Highlands and Islands.

Crofts range in size from less than 0.5ha to more than 100ha. An average croft is nearer 5ha.

A crofter is the tenant or owner-occupier of a croft. Usually, the crofter holds the croft on the "statutory conditions", which apply to every croft tenancy, and will not have a written lease.

There are three legislative duties which must be adhered to. Residence on the croft is required or the crofter must reside within 32km; there is a duty not to neglect the croft; and to cultivate and maintain the croft for agriculture or to put it to another purposeful use (e.g. any use which does not have an adverse effect on the croft, the public interest, the interests of the landlord or the use of adjacent land).

Common Grazings

There are approximately 1,000 common grazings in the crofting counties. A common grazing is an area of land shared by a number of crofter shareholders. The use of a common grazing is governed by a grazing committee, elected by the shareholders in the Common. Individual shareholders have a 'souming' which governs the number and type of stock they are allowed to graze. Details of shares and 'soumings' are contained in the Regulations for the Common Grazing.

The Crofting Commission

The Crofting Commission is a Non-Departmental Public Body (NDPB) responsible for regulating crofting. The Commission comprises of six Crofting Commissioners elected from geographic areas in the crofting counties, and three Commissioners appointed by the Scottish Government.

The Crofting Commission assess and decide on regulatory applications, such as those listed below. Their staff work on ensuring crofts are utilised by resident crofters, support Common Grazing committees, and develop resources and training.

Obtaining a croft

There are several ways to obtain a croft. The following table gives details of these, and the requirements involved.

Type of change	Description	Notification to Crofting Commission	Crofting Register Required?
Assignment	Transfer of a croft tenancy from tenant crofter to proposed new tenant	Assignment Application Croft Tenancy form	Yes
Sub - Let	Transfer of a croft tenancy from tenant crofter to proposed new tenant for a fixed period of time	Subletting Application Croft Tenancy form	No*
Change of ownership – tenant purchasing croft	Purchase of Croft	Notification of change of ownership form	No*
Change of ownership – change of owner-occupier	Purchase of Croft	Notification of change of ownership form	Yes
Letting	Croft is let by landlord or owner-occupier to a tenant	Application to Let Croft (Whole or Part)	Yes
Short Term Letting	Owner Occupier letting a croft to a tenant for less than 10 years	Short Term Let Application Owner-Occupier Crofter	No*

* Refers to First Time Registration. Please note that if the croft concerned is already on the new Crofting Register, then a Form B and a £90 fee will be required to update the register.

Crofting terms

Decrofting is the term used for the process of removing land from crofting tenure. This is typically used to secure a house site suitable for commercial lending.

Resumption, similar to decrofting, is the removal of land from croft tenure; in this case it is carried out by the landlord, following permission from the Scottish Land Court.

Apportionment is the term used when someone who shares in a common grazing wants to take part of the common grazing for their own exclusive use.

Deemed croft is the name for a grazing share which has been separated from the croftland.

Crofting register

The crofting register is map based and provides a definitive record of the extent of, and interest in, land within crofting tenure in Scotland. The register shows the boundaries of land and the name and address of the crofter. The register is maintained by the Keeper of the Registers of Scotland.

Applications to register a croft should be submitted to the Crofting Commission. As well as completing Form A which can be found at <https://www.ros.gov.uk/services/forms/guidance-and-forms> a clear and legible map showing the boundaries of the croft must be supplied. Maps that meet the desired standard can be acquired from local authorities, architects and surveyors and distributors of Ordnance Survey maps.

Small Farms

In contrast to crofts, small farms are not specifically mentioned in legislation; instead they are governed under the same agricultural tenancy legislation as detailed in pages 398-403, unless they are small landholdings, of which there are only seventy four (74). Small landholders have rights of security of tenure, but they do not share the same benefits or legal rights as crofters or tenant farmers with secure 1991 Act agricultural tenancies.

To be eligible for small farm specific grants and services, the Scottish Government deems a small farm to be a holding between 3ha and 30ha in size.

Rural Aid Schemes for Crofts and Small Farms

Agriculturally active crofts and small farms are entitled to the same direct subsidies that are available to the rest of the farming industry, as detailed in the Rural Aid Schemes section on page 468. There are also grant schemes specifically designed to benefit crofters and small farmers.

Crofting Agricultural Grant Scheme (CAGS)

This scheme provides grants for crofters to make improvements to their crofts and help to sustain their businesses. Funds of up to £25,000 for individual crofters and £125,000 for groups of crofters can be used for capital projects, such as the construction or improvement of agricultural buildings and for the establishment of Common Grazings Committees.

CAGS grant rates are shown in the following table:

	Individuals		Groups ¹	
	Young Crofters ²	Other Crofters	Young Crofters ²	Other Crofters
LFA	80%	60%	90%	80%
NLFA	60%	40%	80%	60%

¹ e.g. Grazing committees.

² under 41 years old, with adequate occupational skills and competence, and in business for less than 5 years.

Funding for eligible capital projects can cover all aspects of the project, including the cost of materials, transportation of materials, costs of contractors and own labour. Items eligible for grant aid include:

1. Erection or improvement of agricultural buildings, and shelters for the temporary housing and sheltering of out-wintered livestock.
2. Works associated with agricultural building, including yards, hard-standings, dungsteads, and silos (excluding grain silos).
3. Investment in land management, including the initial grassland improvement works for the restoration of degraded land and the control of bracken.
4. Slurry stores.
5. Arterial drainage and field drainage.
6. All other forms of general drainage including under drainage, hill drainage and ditching.
7. Provision or improvement of facilities for the organised feeding of out-wintered livestock, including permanently fixed troughs and feed barriers, and associated concrete bases.
8. Provision or improvement of equipment for the handling and treatment of livestock.
9. Planting of shelter belts and the provision of fences, hedges, walls, gates or stock grids.
10. Provision or improvement of amenities, including water supplies, mains electricity connections, electricity generators or gas supplies.
11. Provision of electrical equipment.
12. Provision or improvement of access tracks to land improvement areas, roads, bridges, culverts, or boat slips.
13. Assistance of up to £500 towards the establishment of a properly constituted Common Grazings Committee.

Cattle Improvement Scheme

The 'bull hire scheme' enables crofters to benefit from access to high quality, healthy bulls, chosen using Estimated Breeding Values (EBV), and therefore supply high quality calves to the beef industry throughout Scotland and beyond.

The scheme supplies bulls to areas where no practical alternative means of service are readily available. The cost of hire is subsidised by up to

60%. In addition, scheme staff are available to offer advice and guidance on all matters relating to the husbandry and welfare of the bulls. Approximately 3,500 calves are sired annually by Scottish Government bulls, from which home-bred replacement heifers are retained and the surplus sold on.

Small Farms Grant Scheme

This scheme closed in 2022 and is currently under review.

Croft House Grant (CHG)

This scheme provides grants for crofters to improve and maintain the standards of crofter housing, with the aim of attracting and retaining people within the crofting areas of Scotland. Grants are available for a) new builds, b) major repairs, internal improvements and rebuilding work, and c) energy efficiency measures.

a) New house builds

There are limits applied to the size of a new build house which relate to the number of bedrooms:

House type	Two bed single storey	Two bed two storey	Three bed single storey	Three bed two storey	Four bed single storey	Four bed two storey	Five bed single storey	Five bed two storey
Maximum eligible floor area (m2)	112	120	138	146	164	172	191	199

These limits also apply to house improvement grants where the proposal is to increase the size of the dwelling house.

Funding rates

Funding of £38,000 is available for new builds in high priority areas and £28,000 in standard priority areas.

b) House improvements

The grant can be used to facilitate minor and major improvements to existing croft houses. Croft houses which have been decrofted for mortgage purposes are still eligible provided the applicant meets the remaining scheme requirements.

Example of Minor improvements include:

- First time provision of modern fitted kitchens (not replacement).
- Rewiring where the existing wiring has become unsafe or un-serviceable.

Examples of Major improvements include:

- Replacement of roof covering.
- Replacement of gutters and down pipes.
- Provision of, or modification and repairs to chimneys and flues.
- Repairs to cracks in walls.

Intervention rates

Funding of 60% of the costs up to a maximum of £38,000 in high priority areas and up to £28,000 in standard priority areas. Projects below £8,000 in value are ineligible for grant aid under CHG.

c) Energy Efficiency

This grant can be used to bring a property up to a minimum Band C Energy Efficiency Rating, based on the recommendations of an Energy Performance Certificate (EPC) for the property.

Examples of Energy Efficiency works include:

- Under floor insulation
- Loft insulation
- Wall insulation (Cavity, Internal or External)
- Heating Upgrades and improvements
- Window and Door Upgrade

Intervention rates

Funding of 80% of the costs up to a maximum of £38,000 in high priority areas and up to £28,000 in standard priority areas. Projects below £8,000 in value are ineligible for grant aid under CHG.

Quotes

No quotes are required for new build houses; improvement works require a minimum of two competitive quotes for the proposed works. If the crofter is a builder and wishes to carry out the work this is acceptable; however, they must submit a quotation. In these circumstances the crofter would need to submit the two other competitive quotes in addition to his/her own. The quotations must be submitted along with the application.

Eligibility & Application Windows

Eligibility is partly based on the production of a 5-year business plan for the croft. Applications are accepted all year round, but decisions are typically made four times a year with the following closing dates: 1st March, 1st June, 1st September and 1st December.

Scoring

Applications are assessed on a points system to help prioritise funding. Scoring takes into account: current accommodation, assignation re-let details, other property which is/was owned and could/has been sold, and also current and proposed croft activity.

Agri-Environment Climate Scheme (AECS)

Full details of AECS can be found on page 476. There are a number of options which are particularly relevant for crofters and small farms. These include:

Management Option	Payment Rate
Conservation Management of Small Units (up to 30ha)	£77.78/ha
Cattle Management on Small Units (up to a max of 20ha @ 2 ha/cow)	Retention - £107.38/ha Introduction - £162.63/ha
Cropped machair	£239.76/ha

Croft and Small Farm Gross Margins

The gross margins on the following pages give an insight into livestock enterprises on a smaller scale. The gross margins are an illustration and must be adjusted for specific circumstances. The variable costs take account of added costs for smaller volumes being purchased and/or for being based in remote and island areas. All concentrate feeding and straw (for feeding and bedding) are assumed to be bought-in.

Beef

The suckler cow margins are based on crofts and small farms with a mixture of inbye ground and rough grazing/common grazing. The margins provide an illustration of a herd with 2 native type suckler cows on in-wintered (native cross cattle) and out-wintered (pure native) systems calving mainly in February - April.

Output is based on a calving percentage of 90% and selling weaned calves in October. Income from the SSBSS (see page 474 for more detail) is based on the Island rate. This should be reduced by £40/cow (90% calving percentage) if budgeting for a mainland system. Adding value to output would come from direct marketing beef.

Replacement costs are based on purchasing all breeding stock. If hiring a bull, this cost should be adapted.

For more information on keeping cows see pages 112-123, 148-177, 406 and 409.

Sheep

For crofts and small farms, sheep provide a basis in getting started in commercial livestock farming. Compared to cattle, sheep require a lower capital investment to establish a flock and income can be generated within a 12 month period due to their short gestation period.

The sheep gross margins illustrate technical and financial performance for a range of croft and small farm situations. The margins are based on Blackface and Cheviot hill breeds and Mule and Texel-cross type lowland breeds. Where other breeds are used, prices should be adjusted accordingly. Income comes from selling lambs either as store or finished animals and cast sheep at the auction market. Adding value to output would come from direct marketing lamb or fleece.

Replacement costs are based on retaining homebred ewe lambs or buying in gimmers for lowland situations. Rams are assumed to be hired. Where buying rams, costs should be adjusted. The margins do not account for keeping flock replacements.

For more information on keeping sheep see pages 112-123, 180-207, and 409.

Free range chicken egg production

Free range egg production is an ideal enterprise for a croft or small farm business. There is a smaller land requirement compared to other livestock, low flock set-up costs and quick and regular cashflow. Any significant capital expense will be mainly dictated by requirement for bird housing. In recent years there have been housing orders for poultry. Given this background, it would be advisable to design your system and housing around this, for example considering if there is good ventilation in buildings and considering if an outdoor area can be netted off.

From 1st September 2024 all bird keepers will need to register on the Scottish Kept Bird Register. If the intention is to sell eggs beyond the farm gate, e.g. to farm shops or local shops, then the business should be registered with the Scottish Government Eggs and Poultry Unit. For details and guidance see:

<https://www.ruralpayments.org/publicsite/futures/topics/inspections/all-inspections/egg-and-poultry-inspections/>.

For alerts from APHA about poultry diseases see:

<https://www.gov.uk/guidance/apha-alert-subscription-service>

http://animalhealth.system-message.co.uk/AH_subscribe_index.php

The enterprise illustrated assumes chicken egg production using hybrid birds. Egg production using native chicken breeds or other species, such as ducks or geese could also be considered. The gross margin assumes buying point of lay pullets, purchase of feeding in 25kg bags (purchasing at least 1t at a time) and marketing eggs at the farm gate using labelled (with laying date and best before) half dozen boxes. When selling the eggs at the farm gate, a premium price is available as customers appreciate the eggs freshness, provenance and taste.

Other croft and small farm enterprise options

See the Diversification section on page 285 for more information on other livestock and farm diversification ideas.

Suckler Herd - Croft and Small Farm

PHYSICAL DATA

Breed: Cross bred native and purebred native cows bred to native bull.

	Upland suckler in-wintered	Hill suckler out-wintered
Calving period		Feb-Apr
Calves weaned	90%	90%
Month of weaning	October	October
Days to weaning	220	220
Month of sale	October	October
Lwt of calves: at weaning (kg)	255	235
Lwt of calves: at sale/transfer (kg)	255	235
Herd life of cows (years)	10	9
Herd life of bulls (years)	4	4
Cow mortality (%)	1	2
Calf mortality (%)	4	4
Cow:bull ratio (:1)	10	10
Feeding/cow and calf (winter days):	180	180
silage (t)	5.4	6
straw (t)	0.6	0
calf concentrates (kg)	100	0
cow concentrates (kg)	180	225
Grazing fertiliser (kg N/ha)	40	30
Silage & aftermath fertiliser (kgN/ha)	125	125
Silage:		
yield (t/ha from 1-cut)	20	20
DM quality (g/kg)	280	280
ME quality (MJ/kg DM)	10.5	10.5
Overall forage area (ha):		
silage and aftermath grazing	0.27	0.30
Improved grazing	0.30	0.20
Unimproved / Hill Grazing	2.00	4.00
	<hr style="width: 50%; margin-left: auto; margin-right: 0;"/> 2.57	<hr style="width: 50%; margin-left: auto; margin-right: 0;"/> 4.50
Housing system: access to shed		
Straw for general use incl. calving pens	0.25	0.10

Suckler Herd - Croft and Small Farm

GROSS MARGIN DATA

	Upland suckler in-wintered	Hill suckler out-wintered
	£/cow	
OUTPUT		
Calf sales (lwt)	90%	90%
Steers		
270 kg @ 230 p	528	-
250 kg @ 230 p	-	486
Heifers		
240 kg @ 230 p		
220 kg @ 230 p		
Scottish Suckler Beef Support Scheme	131	131
	<hr/>	<hr/>
	659	617
Less: Replacement - cow	71	73
bull	63	63
	<hr/>	<hr/>
	525	481
VARIABLE COSTS		
Cow concentrates @ £492/t	89	111
Calf concentrates @ £424/t	42	0
Vet & medicines	79	87
Straw feeding and bedding @ £141/t	120	14
Commission, haulage, tags & levies	67	66
	<hr/>	<hr/>
	396	277
Gross Margin before forage	<hr/>	<hr/>
	128	203
Forage variable costs:		
silage @ £597/ha	161	179
grazing @ £124/ha	37	25
	<hr/>	<hr/>
	198	204
Total Variable Costs	<hr/>	<hr/>
	594	481
GROSS MARGIN £/cow	<hr/>	<hr/>
	-70	-1
GROSS MARGIN £/ha	<hr/>	<hr/>
	-27	0

Sensitivity-Change ±

10 p/kg in lwt sale price	
Sale weight ± 10kg	
Herd life ± 1 year	

Change in Gross Margin/head (£)

23	22
21	21
14	9

Replacement cost prices:

Native cross cull cow	£930	Native cross i/c heifer (purch.)	£1,550
Pure native cull cow	£720	Pure native i/c heifer (purch.)	£1,250
Cull bull	£999	Replacement bull (purch.)	£3,500

Sheep Flock – Croft and Small Farm

PHYSICAL DATA

Breeds:

	Hill - Lowland		
Breed of Sire	Hill	Low	Low
Breed of Dam	Hill	Hill/Low	Low
Lambing period	Early April		

Lambs reared (%)

	80%	120%	160%
Lamb crops per ewe (avg)	4.5	4.5	4.5

/10 ewes tupped

Rams Hired	1	1	1
Lamb numbers:			
marked	8	12	16
sold/retained	8	12	16
sold: finished lambs	0	0	9
store lambs	5	9	7
retained for breeding	3	3	0
Ewe numbers:			
culls	2	2	2
mortalities	1	1	1
gimmers purchased	0	0	3
Wool sales - ewes, rams & hogs (kg)	16	25	27
Ewe concentrate (kg)	180	260	420
Forage: improved grazing (ha)	0	0.7	1
silage/hay (ha)	0.1	0.2	0.3
Total forage (ha)	<u>0</u>	<u>0.9</u>	<u>1.3</u>
Bedding straw (kg/day/hd)	<u>0</u>	<u>0.8</u>	<u>0.8</u>

Sheep Flock - Croft and Small Farm

GROSS MARGIN DATA

OUTPUT

			Lambs reared (%)		
			80%	120%	160%
			/10 ewes tupped		
Finished lambs:	0 @	£0	-	-	-
	0 @	£0	-	-	-
	9 @	£105	-	-	945
Store lambs:	5 @	£54	270	-	-
	9 @	£66	-	594	-
	7 @	£73	-	-	511
Cast ewes:	2 @	£65	130	-	-
	2 @	£70	-	140	-
	2 @	£80	-	-	160
Wool sales:	16 @	£0.18	3	-	-
	25 @	£0.18	-	5	-
	27 @	£0.30	-	-	8
			403	739	1,624
Less: gimmers purchased @ £190/hd			-	-	570
ram hire @ £5/ewe			50	-	-
ram hire @ £6/ewe			-	60	60
			353	679	994
VARIABLE COSTS					
Ewe concentrates @ £445/t			80	116	187
Vet, medicines & dips			162	164	171
Bedding straw @ £141/t			-	47	47
Commission, levies, haulage, shearing, scanning & tags			69	99	164
			311	426	569
Gross margin before forage			42	253	425
Forage variable costs:					
silage @ £597/ha			60	119	149
grazing @ £124/ha			-	87	124
Total Variable Costs			371	632	843
GROSS MARGIN			- 18	47	152

Sensitivity-Change ±

Change in Gross Margin/100 ewes (£)

10 p/kg lwt in finished lamb price	-	-	33
£5/hd in all lamb sales	25	45	80
£5/hd in cast ewe price	10	10	10
£5/hd in gimmer price	-	-	15

Free Range Laying Hens - Croft and Small Farm

PHYSICAL DATA

System:	Hybrid
Body weight at 17 weeks (kg)	1.44
Body weight at 70 weeks (kg)	1.97
Age at 50% production (age, weeks)	20
Peak production (%)	80
Pullets housed (weeks)	16
Pullets point of lay (weeks)	18
Weeks in lay per annum adjusted for downtime	49.1
Bird laying cycle (week 18 to 85)	270
Adjusted egg production (eggs/bird/annum) *	184
Livability during lay (%) - refer to breed management guides	92%
Feed use (16 to 18 weeks) (kg/hd)	1.23
Feed use (19 to 72 weeks) (kg/hd)	49.14

* Adjusted for 365d, mortality, downtime (pullet to lay, washing)

Free Range Laying Hens - Croft and Small Farm

GROSS MARGIN DATA

OUTPUT	£/100 bird/annum	£/doz
Eggs sales @ £5.2/doz	7,969	5.20
Old hen value less catching cost	0	0.00
Less:		
Pullet purchase @ £14.50 per bird	1,450	0.95
	<u>6,519</u>	<u>4.25</u>
VARIABLE COSTS		
Feed @ £457/t	1,686	1.10
Other bird expenses	484	0.10
Packaging - trays & cases	693	0.45
Total Variable Costs	<u>2,863</u>	<u>1.66</u>
GROSS MARGIN	<u>3,656</u>	<u>2.59</u>

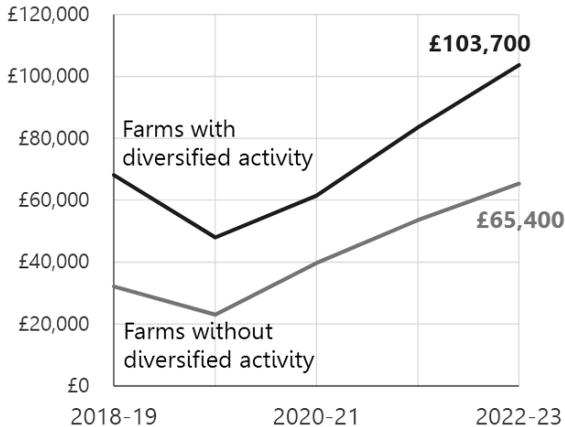
Sensitivity ±	Change in Gross Margin/100 birds/annum (£)
£0.10/doz eggs sold	153
£10/t feed	37
1% increase in mortality at point of lay (£/100 birds)	-4

Note: Costs are typically much higher in a smaller flock, however, this can be mitigated through higher value egg sales direct to customers.

Diversification

Introduction

Diversification presents opportunities for farmers, crofters and land managers to re-assess their asset base and look at ways to generate new income streams to provide a sustainable future for their business. According to the latest Scottish farm business income: annual estimates 2022-2023, 59% of farms surveyed had at least one diversified activity. There is a notable income gap between those with diversified activities and those without. Farms with no diversified activity on average generated £38,300 less income in 2022-23.



Diversification enterprises should ideally complement the existing business model, drawing upon the current skills and interests, experience, buildings, machinery, and/or land capabilities.

Diversification can be an opportunity to support succession planning in agriculture by providing a new role for family members who would like to be more involved in the farming business, and can bring new skills and a fresh perspective.

It is important that farmers do not diversify without considering the impacts a new venture can have. New business projects can take a considerable amount of time and commitment to show results. Depending on the type of diversified enterprise chosen, it may place new pressures and demands on other farm resources such as labour, capital, buildings, land and machinery.

Diversification Considerations

It is highly recommended that businesses considering any kind of diversification carry out market research, a feasibility study and business plan with a diversification professional working directly in the industry.

This will ensure that the best possible advice is presented to the business before they start their diversified journey.

Before launching a new business venture, it is crucial to assess the following factors:

1. **Market** – Assess the market you intend to supply. Are there any opportunities in the market? What is your Unique Selling Point? Can you build and develop your USP? Who are your customers? Where are they located? Are they easy to access? What is the size of your market? Is it a growing market or is the market saturated? Who are your competitors? Identify strengths and weaknesses in your competitors and consider how you can differentiate your offer.
2. **Resources** – Are there any under-utilised resources e.g. outbuildings, cottages, machinery, land, watercourses, woodland, upland pasture etc. suitable for farm diversification? Will they require significant investment to make them suitable for your diversification venture's needs? Is the proposed new venture correct for you, your family and the farming business? Do you or your family have specific qualities, interests, skills and experience that would lend to a specific business venture? Do you have the time to invest in the new business venture while continuing to run the core farming activities? Do you need to take on additional labour?
3. **Location** – Does your existing business, or proposed new venture, have location advantages? Is it near to a busy commuter route? Is it close to tourist attractions? Does the farm have good access? E.g. tarmac/gravel tracks. Does your venture have a suitable infrastructure to make it work? E.g. public transport access, parking facilities, proximity to local amenities, and waste disposal. Consider accessibility and ease of customer use.
4. **Labour** – Do you have sufficient labour and resource to run the new venture along with the existing farm business? Consider your own skills and whether they are suitable or could be further developed. Do you need to employ part-time or full-time staff? Don't spread resource thinly just to try to reduce costs - it is important to maximise efficiency but also maintain good product/service quality and customer experience.
5. **Legal** – Entering into a new business venture may have a different tax and VAT structure from the existing farming enterprise. Seek advice from your accountant and/or lawyer when scoping a new business venture. HMRC should be consulted regarding VAT issues (see page 530 for details on VAT). Diversified businesses may require additional staff, increasing the employer's National Insurance and pension contributions payable under automatic enrolment. The proposed diversified business may be subject to Inheritance Tax and/or Capital Gains Tax when the farm owner/manager passes the

business on to successors. Diversification can change how farmland and buildings are treated for Inheritance Tax purposes. It is advised to seek guidance from a professional to understand the best way to structure your diversified venture.

6. **Insurance** – Changes to your insurance policy may be required when setting up a diversified enterprise. New activities relating to property and/or agricultural buildings will result in a change in cover. Agricultural buildings which are no longer used for livestock or machinery may be classed as a “change in agricultural use”. Contents insurance may be required if the new business has internal materials contained within the buildings, holiday accommodation, or glamping activities. Public Liability Insurance is required to protect you if a member of the public suffers personal injury, or if any of their property is damaged, as a result of your business activities. Employers Liability Cover would be required if you employ full-time or part-time staff to manage, administrate or assist with the business enterprise. This also covers cleaning and maintenance staff.
7. **Risk Management** – A Health and Safety and Fire Plan is required before setting up a new business venture. Business Interruption Cover is insurance that covers the loss of income that a business suffers after a natural disaster e.g., fire, wind, flooding etc. Although Business Interruption Cover is not essential, it is advantageous to cover any financial loss/loss of income incurred due to a natural disaster.
8. **Hygiene** – If you are responsible for developing and maintaining a business’ food safety management procedures, you are legally required to have formal food safety and hygiene certification – contact your local authority for more information. Following registration, your business will undergo regular inspections to ensure that you meet food hygiene standards and legislation. You must also follow the principles of Hazard Analysis and Critical Control Point (HACCP). If you are considering investing in property to make it suitable for food production, ensure you consult a professional in order to make the premises suitable to ensure high levels of hygiene and simple processes. Think of how the business may develop and expand to avoid having to invest twice and interrupt production for improvement or extension. Useful information can also be found on the Food Standards Scotland website (<http://www.foodstandards.gov.scot>).
9. **Planning Permission** – Planning permission may be required if the new business venture involves erecting or modifying a permanent building. Planning permission may also be required if there is a change of agricultural land or change of land use. It is advisable to contact your local authority and/or professional planning consultant early to gauge what planning regulations are required. Getting your

local authority on board early is beneficial in the long run and they can answer any questions or concerns you may have before a project begins. See pages 410-411 for further details.

Specialist advice for farm diversification through the Farm Advisory Service Integrated Land Management Plans (ILMP) can help to explore new ideas and get external professional input into your diversification proposals. More information and funding criteria can be found here: <https://www.fas.scot/specialist-advice/>

Sources of Information

SAC Consulting published a guide for farm diversification giving advice on suitable diversification enterprises supported with case studies. This guide can be found here: <https://www.ruralbrexit.scot/resource/future-proof-your-business-through-diversification-report/>

Links to support organisations and other useful sources of information include:

- SRUC – <https://www1.sruc.ac.uk/>
- SAC Consulting – <https://www1.sruc.ac.uk/business-services/what-is-your-goal/diversification/>
- Farm Advisory Service – <https://www.fas.scot/>
- AHDB Beef and Lamb Box Scheme – <http://beefandlamb.ahdb.org.uk/directselling/box-schemes/>
- Food Standards Scotland – <http://foodstandards.gov.scot/business-and-industry/advice-for-new-businesses>
- Soil Association – <https://www.soilassociation.org/>
- Business Gateway – <https://www.bgateway.com/>
- Scotland Food & Drink – <https://www.foodanddrink.scot/>
- Quality Meat Scotland – <http://qmScotland.co.uk/>
- Visit Scotland – <https://www.visitscotland.com/accommodation/caravan-camping/glamping/>
- Inspired Camping – <https://www.inspiredcamping.com/starting-a-glamping-business/>
- Food Hygiene – HACCP <https://www.food.gov.uk/business-guidance/hazard-analysis-and-critical-control-point-haccp>
- Scottish Agritourism – <https://scottishagritourism.co.uk/>
- Scottish Tourism Alliance – <https://scottishtourismalliance.co.uk>

Speciality Crops

Speciality oil crops

Several speciality oil crops have been grown in the UK for a wide range of uses. Some oilseed crops perform particularly well in Scotland yielding higher oil levels while others are not suited to Scotland due to agronomic

constraints, particularly the higher risk of a late and wet harvest. Crops with greater potential for cultivation in Scotland are outlined below.

Oilseed rape – Developing specialist markets for conventional oilseed rape (*Brassica napus*) and varieties with specialist oil profiles allows diversification whilst having the benefit of a crop which is familiar to growers. Several growers throughout Scotland have set up specialist brands of cold pressed rapeseed oil for culinary use in recent years. These include Mackintosh of Glendaveny, Ola Oils, Summer Harvest, Borderfields, Supernature and Black and Gold. Markets have been developed which recognise the excellent nutritional characteristics of rapeseed oil (it has the lowest levels of saturated fatty acids of all commonly used fats and oils) in combination with the benefits of cold pressing to maintain natural vitamin content. There is opportunity to develop these oils into a wider product range, with the inclusion of flavoured oils and salad dressings. Different formats can also be created, making the product suitable for different markets, whether that be retail, foodservice or export.

High Erucic Acid Rapeseed (HEAR) is grown to produce erucic acid, used as a specialist lubricant particularly for plastics for which it has clearance for food contact. Seed from HEAR varieties is not suitable for human consumption and HEAR varieties cannot be grown in the same rotation as conventional varieties. Yields are typically below the best conventional varieties but similar to average yielding conventional varieties. Contracts for production are available from a number of merchants.

Another oilseed rape type, with high oleic, low linolenic levels in its oil (HOLL), is used as a specialist healthy frying oil. The oil profile of this type means that it is very stable, resisting oxidation and retaining its taste in a catering environment. Details of varieties can be found on the North UK Oilseed Rape Varieties List (AHDB).

Linseed – Linseed oil is high in α -linolenic acid, and used for the manufacture of coatings, drying agents and putty; low shelf life makes it less desirable for food use. In Scotland the area of linseed grown is currently low. Spring sown varieties tend to be rather late maturing for Scottish conditions. The introduction of autumn sown varieties provides an earlier harvest and these have potential for Scotland if winter hardiness can be confirmed with trials currently in progress.

Minor oilseed crops – A range of more novel oilseed crops can be grown in the UK and Scotland though few are presently being widely grown due to limited contracts and agronomic limitations, though this may change.

Crambe: Like HEAR, Crambe (*C abyssinica*) is grown for the erucic acid contained in its seeds. It has been grown extensively in the UK and it

grows well in Scotland. Crambe contains higher levels of erucic acid than HEAR, but its yields are slightly lower.

Echium: *Echium plantagineum*) also known as Viper's bugloss, produces high levels of stearidonic acid (14% of oil). The oil has valuable application in cosmetics and in skin care for the treatment of eczema and sunburn and as an anti-wrinkle preparation, as well as for health supplements such as a fish oil alternative as an Omega 3, 6 and 9 source. *Echium* has been successfully grown in trials in Scotland, although it is challenging to grow and produces low yields. It is spring sown, the crop flowers for an extended period and time of swathing has to be carefully selected to maximise seed setting.

Camelina: Part of the *Brassicaceae* family like canola and mustard, camelina used to be grown in the UK prior to oilseed rape and imported palm oil. It has uses in the food market as a distinctively nutty and pepper oil, or as a seed for topping baked products, and is high in Omega 3 fatty acids. There is also growing interest in its use as a biofuel, particularly for aviation. Technical notes on growing have been produced by Bangor University:

<http://www.calu.bangor.ac.uk/Technical%20leaflets/030201Camelinafinal.pdf>.

Specialist oilseed crops seed suppliers and contract buyers include; Premium Crops (www.premiumcrops.com), and Nature's Crops (www.naturescrops.com)

A collaborative interest group formed to further the interests of cold pressed rapeseed oil also exists (www.scotrapeseedoil.co.uk)

Speciality grains and pulses

Minor cereals and grains – with growing consumer interest in low gluten or gluten-free cereals and many supermarkets investing retail space in providing products for alternative diets, there is increasing opportunity for producers to diversify into alternative cereals. While yields may be lower than conventional varieties, premiums for certain crops can compensate for this, and cereals such as rye, emmer and spelt can perform well in challenging conditions, depending on careful variety choice. Buckwheat can be sold as gluten-free if not contaminated with other cereals, research has shown various health benefits including lowering blood sugar, and it holds potential as a plant protein as a naturally high protein cereal.

Dehulling and processing can be challenging as machinery may need to be adjusted, and small quantities can be a barrier for larger processors. A contract is advisable for alternative cereal crops, as well as consulting the processor on choice of variety for the intended use/market.

Alternative proteins – Grain legumes are often seen as a low-income crop in arable rotations, with higher value break crops such as rape given preference. However, improving prices, reflecting increasing market interest for locally-grown (and soya alternative) legumes for both feed and food, offers potential for future domestic pea and bean production. Higher value feed markets, such as protein substrate for salmon feed, as well as more options for products destined for human consumption (with a premium of up to £100/t) and climate related co-benefits, may, provide further market opportunity in the future.

Changing consumer demands has seen a year-on-year growth in meat alternative products as well as more sophisticated ways of processing vegetable proteins, providing increasing demand and higher-value markets for pulse crops. Recent market trends have seen a significant focus on foods that support gut health and healthy gut microbiome. Legumes and pulses are of increasing profile via recognition that these products can often offer a cheaper and more accessible way of increasing protein in our diets.

Legumes require no additional nitrogen and can carry over 30kg N/ha in the soil for subsequent crops, reducing N leaching and costs of applied N (of £24/ha). They are beneficial in arable rotations for disease, weed and nitrogen management, and although they are less profitable as stand-alone crops, their returns are improved when factoring in yield benefits and reduced input costs to subsequent crops in the whole rotation. Trials of intercropping peas with spring barley in Scotland have shown to have no adverse effects on yield and improved returns, and farmers in Scotland are actively and productively doing this; alternative methods of cropping such as this therefore offer potential for expanding production of other legumes. The PGRO publish an annual list of recommended varieties, as well as an agronomy guide for grain legumes, trial results and troubleshooting guides (www.pgro.org).

Lupins: Lupins can be grown as a high-quality alternative to soya for livestock feed, and offer a much higher protein content than either peas or beans. There are various potential food uses, although being a common allergen it is less preferred for food markets. Largely spring varieties are available in the UK and prefer a pH of 7 or less. An Agronomy Guide for growing lupins is available on the PGRO website (<http://www.pgro.org/downloads/Lupin-Agronomy-Guide-2014.pdf>).

Essential oil crops

Essential oil crops are generally grown on a smaller scale than the specialist oil crops mentioned above and can provide high value opportunities. Several are being grown throughout the UK, including lavender, peppermint, rose and rosemary, although the less favourable conditions at harvest in Scotland limit production potential.

Fibre crops

Flax and hemp for fibre can both be cultivated successfully in Scotland and more widely in the UK. There is interest in increasing the use of natural fibres, however, commercial scale processing of these fibres is currently absent or limited in Scotland and the UK at present.

Flax is traditionally used for high quality linen production requiring exacting production conditions. There are a small number of producers in the UK for niche, small-scale markets, and no open market currently.

Industrial hemp is usually grown for either fibre or oils/seeds, and there are currently around 40 producers across the UK; currently dual-purpose varieties struggle in the UK as the seeds ripen a month after the fibre is suitable for harvest. Hemp can be incorporated into an arable or mixed arable rotation as a break crop, and is effective in improving soil, sequestering carbon to an amount which could compete with timber, absorbing soil pollutants, and reducing use of inputs. Hemp is relatively hardy, but performs best on deeper, lowland soils.

End uses include biocomposites for car components in the automotive industry, lightweight glass replacement in the aviation industry and insulation materials in the construction industry. A further use for hemp in construction is as 'hempcrete', where the inner core of the stem is blended with a lime-based binder and cast around a timber frame. Hempcrete's qualities of high levels of thermal insulation and excellent strength characters are of note and it meets building regulations, counting towards the code for sustainable homes (CSH). There is also scope for hemp to be used in sustainable packaging alternatives, as industry, consumers and policy increasingly look for non-plastic options as well as other high-value markets (e.g. hemp mattresses), which are increasingly being explored and production area in the UK slowly expanding.

In addition to fibre use, the oil from the seeds has an application in the higher-value specialist food and beauty markets, which have more than doubled during the last five years due to interest in health claims, and is expected to triple in value over the next five years; products from this include essential (CBD) oils, cooking (hemp) oils, teas, milk alternatives, and flours/meals, as well as protein-based by-products. The Scottish Hemp Growers Association group, created in 2019, is focussed on furthering the interests of Scottish grown hemp.

The lack of processing facilities in Scotland and the UK limits greater cultivation of these crops as they are bulky and expensive to transport in their raw state, hence it is necessary to have processing facilities close to the site of production for economic viability. Only varieties of hemp with a THC content of less than 0.2% and from EU approved seed can be grown; a licence is required for the cultivation of hemp, which can be obtained through the processor of the hemp fibre, or applied for directly through the Home Office, and lasts for three growing seasons.

Alternative Livestock

There is a wide range of alternative livestock enterprises that farmers can diversify into, many of which can use existing husbandry skills, and complement existing livestock systems on the farm. Alternative livestock are principally kept for fibre (e.g. cashmere goats, alpacas, angora goats, etc), meat (e.g. wild-boar, buffalo, ostrich, venison, ducks, geese, rabbits, etc), milk and dairy products (e.g. dairy-goats, dairy-sheep, etc) or worms for a variety of reasons including; composting of green waste, fishing bait, sale of composting and earthworms for household food waste/compost etc.

Diversification into alternative livestock can have considerable capital costs to start-up, particularly through the requirement to purchase livestock, equipment, and infrastructure (deer fencing, handling facilities etc).

Before diversifying into alternative livestock, the economic viability of this venture should be explored. Whether you keep alternative livestock for fibre, meat, or other uses, the end markets can be very niche with limited demand. When undertaking an economic viability assessment, consider alternative markets too, rather than your immediate area. Tastes and attitudes around the world vary and there may be great demand for a product like yours beyond your doorstep. Engage with organisations like Scottish Development International or UK Export Finance to understand opportunities in alternative markets.

In addition to the actual cost of livestock, there can be high capital costs associated with stock control, such as housing, fencing and specialist handling facilities (e.g. specialised wild boar and deer fencing). If alternative livestock are being farmed for meat then it is also recommended to check that local abattoirs are licensed to slaughter that specific type of animal and, if not, what alternatives may exist.

Honey production may be a suitable diversification option for some farmers. Bees play an important role in the pollination of food crops and could be introduced alongside an existing arable, fruit or vegetable enterprise. More information can be obtained from the Scottish Beekeepers' Association (www.scottishbeekeepers.org.uk) and the British Beekeepers' Association (www.bbka.org.uk).

Insect farming could provide a sustainable alternative protein source for animal feed, while helping to reduce our reliance on protein imports and environmental impacts. Insect farming provides a circular economy opportunity to turn organic residues, including pre-consumer food waste, into feedstock for food systems. Scotland is well placed to become a global leader in this emerging industry, contributing to the Scottish Government's circular economy objectives and food waste reduction

targets. Insect farming can also support aquaculture, agriculture and food and drink businesses. Insects need high quality feeds to perform well just like any other livestock. Production systems can be very expensive, highly automated with purpose-built units. More information can be found here:

<https://www.zerowastescotland.org.uk/event/insect-farming-scotland>

It is advised that anyone who is considering diversifying into alternative livestock should contact the appropriate producer association for advice and support at an early stage of the diversification process. It would also be valuable to speak to others already working in the sector.

Information specifically on deer farming can be found on pages 210-219.

Retailing

Selling farm produce directly to consumers can be an excellent diversification option for farmers enabling them to add value to their primary produce. In an increasingly global market, consumer awareness of the food and drink they consume, where it comes from, and the environmental impacts of our global food system has become a more significant priority for consumers. This presents a huge opportunity for farmers, and food and drink producers to sell their produce locally, promoting high quality produce with strong provenance and environmental credentials.

Farm retailing can range from simple 'honesty boxes,' 'box' delivery services, farm vending facilities, to large, multifunctional retail outlets.

As with any business venture, market research, a feasibility study, and a rigorous business plan incorporating a marketing plan should be prepared and should include information and research into all the relevant aspects of the proposal, such as:

- The size of the local population within a 30-60 minute drive of the proposed retail outlet(s).
- Key transport routes e.g. can your outlet be serviced by local transport?
- Capital costs: car parking and access, construction, storage facilities, website creation, brand and digital investment, purchase of delivery van(s), interior design and materials etc.
- Running costs: including business rates, rent, staff costs, advertising, and other fixed/variable costs.
- Consideration of range, variety and pricing (this should reflect the quality of produce offered including the freshness, environmental impact and provenance of the produce on offer).
- Seasonality: will your outlet be likely to be affected by peaks and troughs in produce availability, seasonal worker labour and the tourist season?

- Competitor outlets (not just other farm shops).
- Planning permission requirements.
- Legislative requirements (e.g. environmental health, food hygiene, labelling, health and safety, trading standards, access from the local Highways Authority, accessibility requirements).

Further advice is available from a number of sources including:

- SAC Consulting Food and Enterprise: <https://www.sruc.ac.uk/business-services/sac-consulting/food-enterprise/>
- Taste of Scotland: <http://taste-of-scotland.com/farmers-markets-in-scotland/>
- Farm Retail Association: <https://farmretail.co.uk/>
- National Farmers' Retail and Markets Association: www.farma.org.uk; Telephone: 0345 319 6740
- The Larder - A Guide to Scotland's Food & Drink: <https://food.list.co.uk/guides/the-larder/>
- Scottish Government food and drink policy: <https://beta.gov.scot/policies/food-and-drink/>
- Scotland Food and Drink: <http://www.foodanddrink.scot/>
- Food Tourism Scotland Strategy: <https://www.foodanddrink.scot/resources/publications/food-tourism-scotland/>

Farmers' markets

Farmers markets provide a great opportunity for producers to sell directly to consumers, and for consumers to purchase fresh, local food and drink on the high street. Most farmers' markets are held monthly, with some held more frequently, particularly in areas with larger populations.

In recent years, there has been an increase in online retail sales through businesses' own websites, collaborative online food hubs and farmers markets. 'Neighbourfood' is an example of an online marketplace where consumers can order local produce online and collect from a local collection hub.

More information can be found here:

<https://www.neighbourfood.co.uk/>
<https://www.neighbourfood.co.uk/markets>

Producers considering selling produce through a farmers' market should:

- Assess what is already being sold at the market. Will there be a demand for their produce? Is there enhancement of the product range? Some markets will limit the number of producers from the same sector eg meat, alcohol etc.
- Contact the market organiser for more information on the operation of the local market.
- Visit a local market and obtain information on competitors' products and prices.

- Consider whether the business can commit the time, money and other resources to preparing and selling produce at farmers' markets.
- Think about how the customer will be attracted to the product. Consider the product itself, packaging, information about the product, layout of the stall and price.
- Weather can be a significant factor in the success of a farmers market from one week to the next, with most farmers markets hosted outside. Consider planning your attendance, stock levels and set up in accordance with the weather forecast.
- Consider how the product can be stored and displayed, ensuring compliance with all legislation and other regulations. For more information contact Food Standards Scotland (www.foodstandards.gov.scot).
- Contact your local regional food group.

Farm shops

Farm shops vary in size and product/service offering and it is important to carry out a feasibility study before starting. New retail outlets or farm cafes must provide a unique selling point or have a strong attraction in order to attract and retain customers. Many farm shops are now becoming food tourism destinations where customers spend time participating in recreational/leisure activities during their visit. Consider what how you can add opportunities to encourage your visitors to stay longer, the inclusion of a café or restaurant in a popular way to encourage visitors to make a day of visiting your site.

The increase in popularity of farm shops is linked to the growing trend amongst consumers to buy local food with strong provenance and traceability. Most farm shop businesses are initially based around products that are produced or made on the farm, in the shop, or where possible, within the local area. Linking the farm shop to produce grown or made on the farm and telling the history or provenance of the farm is a key marketing tool.

Vending Machines (Milk & Fresh Produce)

With strong consumer demand for local, traceable produce, installing a vending machine is a relatively low-cost method of diversification. Farm vending allows consumers to purchase fresh local produce such as potatoes, vegetables, eggs, soft fruit, and more, 24 hours per day, 365 days per year. Farm vending provides farmers with significantly higher profit margins than mainstream markets and ensures that profits are retained at the farm gate. Farm vending is also advantageous as it requires very little labour, which can often be one of the most significant overheads associated with running a farm shop.

Farm vending machines are usually custom-built and come in varying sizes. Machines can be ambient or chilled depending on the type of produce sold. Some farms have chosen to create walk-in farm vending

retail spaces where customers can browse products, purchase fresh produce, and buy fresh coffee from self-service takeaway machines.

In the correct location, with a good variety of produce available, farm vending machines can have a payback period of around 12 months. Vending machines should be ideally positioned where there is good vehicular access and/or areas with high customer footfall, i.e. farms near to a main road, shopping centre, caravan park, petrol station, etc. Machines need to be kept under cover to protect them from the elements and consideration should be given for parking and groundworks.

Planning permission may be required if the machine is located within a purpose-built shed/outbuilding. Keeping vending machines stocked with a variety of seasonal fresh produce is important to ensure repeat custom. Ensure that you provide the opportunity for customers to pay using their chosen method both card and cash – in an increasingly cashless world, it is vital to provide card payment facilities to avoid missed sales opportunities.

Tourism

Agri-Tourism

Farm-based recreation or 'agri-tourism' is becoming increasingly popular among tourists/visitors and is a diversification enterprise which promotes a more diverse and sustainable rural economy. Agri-tourism provides farmers, crofters and landowners with additional income and the opportunity to share their experiences with a wider audience.

Agri-tourism has moved towards the provision of rural experiences where customers can get a hands-on flavour of the countryside and/or the daily life of a farmer. Bespoke packages can be created and may include accommodation, private dining experiences, farm tours, lambing experiences, and other farm-based activities.

Farm Tours

Farm tours and supervised on-farm experiences can be very socially rewarding for both farmers and customers, strengthening relationships between farmers and the public. Farm tours and other educational initiatives allow visitors to learn about farming, food production, and the environment, and can be very financially rewarding for farmers and landowners. Farm tours are relatively easy to set up without considerable overheads, but considerations should be given for public liability insurance, health & safety, and showcasing your business and farm animals to the general public in the best possible way. Consider the limitations of what is possible to showcase in a safe manner as well as making consideration for potential customers who may have differing access needs.

Health & Wellbeing Tourism

Health & Wellbeing tourism continues to be an exciting opportunity for diversification where visitors can engage in a variety of wellbeing activities, farm tours, nature trails and more.

Sensory gardens, forest bathing, organic skincare products, paddleboard yoga, thermal pools and wild swimming continue to drive consumer interest. Those booking rural breaks in Scotland also want good local food and drink with nutritional benefits to aid their health and wellbeing.

Ecotourism and nature-based tourism

An increasing number of tourists and visitors are looking for “green” holidays or activities. Ecotourism, which tends to be connected to educational aspects such as the promotion of sustainability, is different from nature-based tourism which can be viewed as tourism to places of natural significance or beauty, although there is some overlap between the two concepts.

Businesses looking to diversify could consider their own ‘green credentials’ and how they could, if necessary, modify their marketing to attract the maximum number of customers. Many businesses are members of initiatives such as the Green Business Tourism Scheme (www.green-tourism.com) and membership of such schemes can be used in marketing and promotional material. Tourism businesses could incorporate nature-based activities such as wildlife-watching and adventure-based activities into their offering to take advantage of their natural capital. Information on the local environment, scenery and nature-based activities in the area could also be provided to potential customers. Signposting and collaboration between businesses adds to the customer experience and also supports the local economy. Seek support from professionals to ensure you get the messaging right around your ‘green credentials’ to avoid making claims that cannot be confirmed and the potential for ‘green washing’.

Self-catering

Planning permission and building regulations (see pages 410-411) are the essential first steps when considering offering self-catering accommodation. If starting a new business or converting/extending your premises, you should contact your local authority planning department for their advice on planning permission at a very early stage. Any structural alterations to a property, or the construction of a new building, will be subject to building regulations, so again contact your local authority.

From 1st October 2023 all short-term let accommodation, unless specifically excluded, requires a licence. The licence is granted by your local authority and the fee is dependent on property size and type and will typically last for three years. The licence ensures properties meet the legal repairing standard, energy standards, and fire, gas, water and electrical safety, as well as additional requirements depending on local

authority and property type. More information can be found here: <https://www.mygov.scot/short-term-let-licences>

Good marketing is required to maximise occupancy rates and participation in quality assurance schemes will also be beneficial, e.g. VisitScotland Quality Assurance Schemes (www.visitscotland.org). Membership of associations can also be beneficial, such as the Association of Scotland's Self-Caterers (<http://www.assc.co.uk/>). These associations and membership groups provide up to date information and guidance particularly any changes to health and safety and cleaning protocols.

Glamping

Glamping is a tourism experience where individuals, couples, or groups seek to immerse themselves in the natural environment by going back to basics and re-connecting with nature from a luxurious base. Glamping has become a popular option for UK holiday-makers and overseas visitors seeking the luxuries of hotel accommodation alongside the freedom and adventure of camping. Glamping sites usually provide electricity, heating, kitchen and toilet facilities as standard, with many sites now offering saunas, jacuzzi's and hot tubs. Due to the popularity and availability of glamping in the agri-tourism market, customer expectations have increased, and many providers are now operating in competition with 4- and 5-star rural accommodation providers.

Careful consideration should be given before starting a new glamping business to identify ways to differentiate in the market through additional activities, such as food and drink experiences, farm tours, and educational initiatives.

Glamping sites should ideally be located near areas of spectacular scenery, on the banks of lochs, nestled beneath hillsides, along popular walking or cycling routes, or within proximity of towns, villages or cities. Planning permission may be required for a glamping site in some locations. Conflicts of interest between tourism, accommodation, cars, caravans, and the natural environment should be considered. Seek advice from your local authority at an early stage of the diversification project.

Sources of information

- Go Rural (<https://www.goruralscotland.com/>)
- Criteria/guidance for Small Serviced Classification (http://www.visitscotland.org/business_support/quality_assurance/accommodation/self_catering_accommodation.aspx)
- Farm Stay (www.farmstay.co.uk)
- Accommodation in Scotland (<http://www.explorescotland.net/holiday-in-scotland/accommodation/>)
- Farm Business Innovation Diversification into Glamping (http://www.farmbusinessshow.co.uk/news/blog.asp?blog_id=2518)

Sports & Leisure Tourism

The outdoor sports and leisure market continues to be a popular diversification option for farmers and landowners.

Farm/Outdoor Fitness

Farm fitness is a relatively new concept which is quite novel as a diversification enterprise. . Consumer demand to keep physically active presents farmers and landowners with the opportunity to provide safe, outdoor spaces for people to exercise. This has now developed into new farm-based gym facilities being offered with state-of-the-art equipment, cardio and weights machines, and outdoor fitness classes.

It is possible to start a farm/outdoor fitness enterprise and employ suitable staff with appropriate skills, qualifications, and enthusiasm, but careful consideration should be given to how the enterprise fits in with existing farming operations.

Children's activities

Farm-based children's soft play areas are popular among families during the holiday season. Converting old farm buildings or utilising fields as a children's play park can be a profitable venture for farmers/landowners. Location, ease of access, and activities offered determine the success of the enterprise. A children's play park would complement a farm shop, café or retail outlet.

Outdoor Education

Outdoor education plays an important role in children's development, educating them on the provenance of food, farming, and the environment. Outdoor education and activities also promote good mental and physical health, by allowing those from an urban area the opportunity to explore the countryside in a safe and supervised environment.

Eco-therapy & Care Farming

Eco-therapy, often referred to as 'green care' or 'green exercise,' is a form of therapeutic treatment in which patients take part in activities in the natural environment. These activities may include gardening, caring for animals, woodland walks, and horse riding, and has shown results in

supporting people experiencing anxiety and/or depression. Nature has incredible healing qualities and eco-therapy is now being prescribed by general practitioners for stress and anxiety.

Equestrian Enterprises

Equestrian related enterprises are often seen as good diversification options for farms or rural occupiers as they can easily complement the existing infrastructure land and business model of the farm. Enterprises that are commonly considered are:

- Horse Livery
- Cross Country Course
- Riding School
- Horse Bed and Breakfast
- Horse Riding Holidays
- Equine Health
- Equine Chiropractic
- Equine Massage

Horse livery

On-farm horse and pony livery can range from providing grazing only, to DIY livery, and full livery (including labour, grazing, stabling, grooming, feeding and possibly exercise).

Financial returns will vary depending on the level of service (which is dependent on the knowledge of the person/s running the yard) and facilities being provided (e.g. a basic farm diversification versus a specialist / professional yard).

Livery services are likely to range from 70-100% occupancy. Grass and DIY livery are realistically the base market for farm diversification projects while part and full livery services will be more suited to yards with skilled personnel.

Horse riding holidays

Location is fundamental to the success of horse-riding holidays. A riding holiday centre is most suited to premises in scenic and rural areas. Good access to off-road riding over a variety of terrain is essential.

The service can include the provision of horses to hire or there can be the option for guests to bring their own horses.

Basic facilities could include:

- A covered area for tacking up or a tack room.
- Stables and/or grazing (for hire horses and/or guest's horses).
- Toilet facilities.
- Facilities to allow picnics and packed lunches to be consumed.
- Living accommodation for guests

The service can be enhanced by providing other riding facilities, i.e. all weather or indoor arenas, show jumping and cross country facilities, riding lessons, and all-inclusive luxury accommodation. With the above in mind, investment could be high if starting from a blank canvas. This enterprise will work best when there are already horses and facilities in place. Local authority licensing will apply where horses are provided.

Riding for the differently abled

A riding school for differently abled adults and/or children is a rewarding diversification enterprise. Horses and ponies provide therapy, achievement and enjoyment to people who are differently abled. Providing a safe, fun, and supporting learning environment can improve the lifestyle for people with physical and learning difficulties, mental illnesses or other additional support needs. For further information see <http://www.rda.org.uk/>.

Wedding Venues

Converting old or disused farm buildings into a wedding venue may be a profitable diversification option for farmers. Farm-based wedding venues have grown in popularity over the past 5-10 years as couples see farm barns, marquees, and farm countryside as the special place to host their wedding.

Combining a working farm and a wedding venue does not come without its challenges and requires considerable commitment and a specific skillset to run successfully. However, developing a successful wedding venue on a working farm can be a very lucrative diversification option providing significantly higher profits than the core farm business.

Most farm-based wedding venues also offer on-site accommodation for the bridal party and wedding guests. This adds value to the customer experience and can increase revenue potential for farmers and landowners.

Wedding venue considerations:

- Location of the venue near to a main road with good access and transport links. The location should ideally have a picturesque landscape with suitable car parking, toilet facilities and accessibility for differently abled people.
- The level of service offered; basic package of the venue as standard but extra services such as catering, bar, disco/band/entertainment, transport, photography, and on-site accommodation could be included for an additional charge.
- Labour: the venue will require management and a point of contact for those hosting their special day. Careful coordination will be required, often months in advance, allowing for viewings and queries from

those using the venue. The provision of wait staff or bar workers could be considered at an additional cost.

- Planning permission: may be required for the renovation or erection of the proposed venue.
- Legislation requirements such as; health and safety, food hygiene, public liability insurance, alcohol licencing, and employment law may apply to the venture.

Pet Boarding Facilities

Animal husbandry is second nature to many farmers and may be a suitable diversification option to capitalise on underutilised farm buildings. Boarding kennels or a cattery could be incorporated into an existing farm business. Kennel and cattery units vary in size and specifications.

Pet boarding facility considerations:

- The location of the business should ideally be situated near a town or city with a large customer population.
- A change of building or land use may require a change in your insurance.
- Running a kennels or cattery business is a lifestyle choice and the owner may be tied to the business 24/7. Consider employing full-time/part-time staff to share workload and shift patterns to maintain a good work-life balance.
- Noise impacts from dogs and cats may cause offence or nuisance to neighbours.
- Before starting the business, you must contact the local authority to cover any building planning issues, business rates, operating licences and any other obligations.
- You must receive a licence under the Animal Boarding Establishment Act 1963.
- Public liability and product liability insurance is required. You should also be insured for professional indemnity and against the loss of income if you lose your licence. Liability to animals in your care custody and control is required. In the case of kennels and catteries, cover for vets' fees can be extended to include any illness in a client pet that commences within 72 hours after leaving your establishment. Property damage cover should also be purchased.

For further information and a guide to building kennels or a cattery visit <https://www.gla.ac.uk/t4/~vet/files/teaching/SAHusbandry/boardingkennels.pdf>

Forestry and Farm Woodlands

Introduction

Woodlands can be a valuable part of the farm business, providing multiple benefits such as shelter for livestock, windbreaks for crops and income from timber. They can also have a positive impact on a larger scale by capturing carbon, creating wildlife habitat, and contributing to natural flood management.

Increasing the area of woodland in Scotland is a key Scottish Government objective to help meet national targets for reducing carbon emissions, supply the demand for wood products with home-grown timber, and restore and expand native woodlands for biodiversity benefits. Farmers are being encouraged to plant new woodlands and actively manage existing woodlands to benefit the farm business and provide public goods.

On 1 April 2019 forestry became fully devolved in Scotland. Scottish Forestry replaced Forestry Commission Scotland, taking responsibility for policy, regulation, and the Forestry Grant Scheme (FGS). Forestry and Land Scotland (FLS) replaced Forest Enterprise Scotland in looking after publicly owned forests. Both organisations are agencies of the Scottish Government.

This section provides guidance on trees and the law, plant health, woodlands and shelter, timber prices, financial assistance for farm woodlands, and taxation.

NOTE – To ensure that all forestry operations are carried out in accordance with forestry regulations, prior to undertaking any forestry activities such as tree felling or planting, advice should be sought from either Scottish Forestry or from a forestry professional.

Trees, the Law and Regulations

Felling Permissions

Anyone wishing to fell trees requires a Felling Permission (previously called a felling licence) issued by Scottish Forestry, unless an exemption applies or another form of felling approval such as a felling licence (including a forest plan) has previously been issued. It is an offence to fell trees without a Felling Permission if no exemptions apply. Illegal felling can result in a fine of up to £5,000 per tree and a criminal record for those involved.

Changes to the regulation of tree felling in Scotland came into effect on 1 April 2019 when the Forestry and Land (Scotland) Act 2018 replaced the Forestry Act 1967 in Scotland. Felling Licences issued before 1 April 2019 are still valid, if the expiry date has not been passed.

Exemptions

You may be allowed to fell trees without a Felling Permission if an exemption applies. The 2019 regulations made some changes to exemptions, full details are available from Scottish Forestry: <http://forestry.gov.scot/support-regulations/felling-permissions>. Two important changes are that a Felling Permission is now required to clear windblown trees, and to fell nuisance trees.

Exemptions include:

- Up to 5 cubic metres of timber within any set calendar quarter. This exemption does not apply in native broadleaved woodland between 0.1 and 0.5 hectares inclusive and Caledonian Pinewood sites.
- Trees with a stem diameter of 10cm or less, when measured at 1.3m from the ground.
- A tree that poses an immediate danger to people or property.
- Completely dead trees. Trees that are dying or have blown over are not exempt.

Restrictions

Felling must also comply with legislation and best practice regarding water quality, flood risk, conservation areas, and protected species such as badgers or bats.

Felling trees covered by a Tree Preservation Order (TPO) or within a Conservation Area requires additional consent from the Local Authority. Felling within a Site of Special Scientific Interest (SSSI) requires consent from Nature Scot, formerly Scottish Natural Heritage (SNH).

Obligation to replant

Felling Permissions, except those for thinning, are issued on the condition that the felled area will be replanted within a specified timescale, including areas cleared of windthrow. This includes the obligation to carry out the maintenance necessary for the trees to become established. Scottish Forestry may allow replanting in an alternative area of the same size as the felled area.

Grant funding is available to help with restocking for some qualifying sites through the FGS Woodland Improvement Grant (WIG) for Restructuring Regeneration. Note that you first need to have an approved Long-term Forest Plan (LTFP) or Management Plan to be eligible for WIG funding.

Environmental Impact Assessment (EIA)

Environmental Impact Assessment (EIA) is the process of identifying the environmental effects, either positive or negative, of the proposed project on the environment with the aim of avoiding, reducing or offsetting any adverse impacts.

The Forestry (Environmental Impact Assessment) (Scotland) Regulations 2017, are applied to forestry projects, namely afforestation, deforestation,

roads and quarries. If Scottish Forestry, the competent authority, decides that a proposal for one of these projects is likely to have a significant effect on the environment then under EIA Regulations, consent must be obtained prior to starting the work. As a result, you will be required to submit an Environmental Impact Assessment Report (EIA Report) as part of your application for consent.

The process for this, is to identify the activities that will be undertaken. Once these have identified, their potential environmental impact should be assessed, along with any mitigation that could reduce the impact. Once this has been carried out, an EIA Screening Determination form is submitted to Scottish Forestry who will assess the potential impacts and proposed mitigation. If they are content with the proposal, Scottish Forestry will give a Screening Opinion stating ‘consent not required’, this means the works can start. If Scottish Forestry feel that the project needs to be tested with a full EIA, then a ‘consent required’ letter will be issued. At this stage, a scoping process will be undertaken to address the issues that need to be assessed within an EIA Report.

Thresholds and sensitive areas apply to EIA, which enable some work to be undertaken without a full EIA screening being undertaken. These are:

Project	Threshold where any part of the land is in a sensitive area	Threshold where no part of the land is in a sensitive area
Afforestation	2 hectares in a National Scenic Area (NSA) No threshold in other sensitive areas	20 hectares
Deforestation	0.5 hectare in a NSA No threshold in other sensitive areas	1 hectare
Forest Roads	No threshold	1 hectare
Forest Quarries	No threshold	1 hectare

For more information on EIAs, please refer to the Scottish Forestry web page provided using the link below:

<https://forestry.gov.scot/support-regulations/environmental-impact-assessment>

United Kingdom Forestry Standard (UKFS)

The United Kingdom Forestry Standard (UKFS) is the reference standard for sustainable forest management in the UK. It outlines the context for forestry, sets out the approach of the UK governments to sustainable forest management, defines standards and requirements, and provides a basis for regulation and monitoring – including national and international reporting.

The UKFS is separated into different elements for sustainable forest management, each supported by Guidelines for managers.

These elements are:

- General Forestry Practice
- Biodiversity
- Climate Change
- Historic Environment
- Landscape
- People
- Soil
- Water

Each of these elements are divided into legal and good forestry practice requirements. These legal and good forestry practice requirements should be followed when undertaking any forest operations.

Should these legal and good forestry practice requirements be breached, Scottish Forestry have powers under the UKFS Compliance Procedure to issue advisory/ warning letters or suspend/ revoke permissions given under Forest Plans, Felling Permissions, Forestry Grant Scheme contracts, and EIA consented operations. Updated 5th edition 2023 will be applied from 1st October 2024.

Further information on the UKFS can be found at:

<https://forestry.gov.scot/sustainable-forestry/ukfs-scotland>

Plant Health

The threat posed by tree pests and diseases is increasing, due to increased global travel, and imported plants and wood products. Climate change is also altering the ranges of many plant pathogens. The risk of spreading tree diseases can be reduced by taking simple biosecurity measures, such as cleaning mud from shoes, dogs' paws, and bike and car tyres between visits to different woodlands. Five of the most common threats to tree health are described below but this list is not exhaustive.

You can find guides to symptoms of tree pests and diseases on the Observatree <https://www.observatree.org.uk/resource-library/> and Forest Research websites: <http://forestresearch.gov.uk/tools-and-resources/pest-and-disease-resources>. If you are concerned about the health of any trees, seek professional advice, and report any confirmed cases on the Tree Alert online reporting tool: <https://treealert.forestresearch.gov.uk/>. It is required by law that diseases classified as notifiable are reported.

Scottish Forestry monitors woodlands for early warning signs of tree health problems and issues Statutory Plant Health Notices (SPHNs) to

landowners. An SPHN will usually require the felling of trees to contain an infection and avoid it spreading further.

Larch disease (*Phytophthora ramorum*) – notifiable disease

P. ramorum is currently the biggest threat to tree health in Scotland, having already infected and killed thousands of hectares of larch. *P. ramorum* does not affect the quality of the timber so infected trees can still be processed but only by facilities that hold a licence to handle the material. A Management Zone covers the centre of the primary outbreak in Galloway. The area covered by the management zone is best viewed on the Scottish Forestry Map viewer:

<https://scottishforestry.maps.arcgis.com/apps/webappviewer/index.html?id=0d6125cfe892439ab0e5d0b74d9acc18>

You must apply for a movement licence to remove wood from a site issued with an SPHN or to move larch material from within the Management Zone to any site outside it. Wood from SPHN sites or wood moving from within the Management Zone to a site outside it can only go to a facility that holds a processing licence to handle it. Information and application guidance for movement or processing licences can be found on the Forest Research website: <https://www.forestresearch.gov.uk/tools-and-resources/pest-and-disease-resources/ramorum-disease-phytophthora-ramorum/phytophthora-manual-9-licences-move-and-process-wood-trees-ramorum-disease/>

Scotland is split into three management zones, based on where actions will have the greatest impact on controlling the spread of *P. ramorum*. For a map of the zones, see: <https://forestry.gov.scot/sustainable-forestry/tree-health/tree-pests-and-diseases/phytophthora-ramorum>.

The rules around felling and planting larch vary between the zones but **outbreaks of *P. ramorum* are occurring in all three risk zones**. All woodland owners should remain vigilant and regularly inspect for symptoms of the disease. Japanese, European and hybrid *Larix* species are all affected. While larch is the main timber tree at risk, rhododendron and other ornamental shrubs are also susceptible and help spread the disease. Other susceptible tree species include sweet chestnut, horse chestnut, beech, and several non-native oak.

P. ramorum is a notifiable disease so must be reported. First check the symptoms against online guidance and report the suspected outbreak through Tree Alert (see above for links). If *P. ramorum* is confirmed, Scottish Forestry will issue an SPHN (if outside the management zone), placing a legal requirement on the owner to fell the infected trees, and a buffer zone around them, within a set timescale. If you receive an SPHN, grant aid is available to assist with agents' fees and restocking. For further information see page 323 and: <https://www.ruralpayments.org/topics/all-schemes/forestry-grant-scheme/tree-health/>.

Chalara Ash dieback (*Hymenoscyphus fraxineus*)

First discovered in the UK in October 2012, Chalara Ash dieback is an infection caused by the *H. fraxineus* fungus, which is spreading throughout the UK. The airborne spores can spread within miles of an outbreak but transport of plants and spores in mud on tyres and shoes is thought to be responsible for spreading the disease over longer distances.

The general advice is not to fell live ash trees, even if they are infected, unless they pose a safety risk. This will allow resistant trees to be identified and survive as future breeding stock. Ash is one of the last tree species to come into leaf in spring, so it is best to look for Chalara symptoms from July to September.

Juniper disease (*Phytophthora austrocedri*) – notifiable disease

P. austrocedri is a fungus-like pathogen which threatens juniper trees in Britain. Juniper (*Juniperus communis*) is an important but declining native species, thus a significant proportion of juniper woodlands are protected. Infected trees have been found at sites across Scotland and the north of England. The pathogen primarily attacks roots and extends up into the lower stem. Eventually the tree will be killed by girdling of the main stem. The pathogen is notifiable, and all suspected cases must be reported through Tree Alert.

Red band needle blight (*Dothistroma septosporum*)

D. septosporum is a fungus which typically attacks older needles on conifers, initially creating yellow bands that turn red. Sometimes all but the base of the needles can turn brown, rather than causing bands. Infected needles will die and fall off, gradually weakening the tree. This reduces timber yields and can eventually kill trees.

It has been found on a range of conifer species but pine are the most common hosts, including Scots, Lodgepole and Corsican pine. The disease exists throughout Scotland and is managed by thinning to increase airflow through the woods, and by planting less susceptible tree species in future rotations. It is not a notifiable disease and there are no restrictions on timber movement.

Dutch elm disease (*Ophiostoma novo-ulmi*)

This disease has already killed 60 million elm trees in Britain and continues to spread throughout Scotland. It is caused by a fungus that is spread from tree to tree by the elm bark beetle.

Local authorities may require owners to fell elms infected by Dutch elm disease, under the Dutch elm disease (Local Authorities) (Amendment) Order 1988. To prevent the spread of the disease, regulations also control the movement of elm logs within the terms of a licence. It is not a notifiable disease.

Phytophthora pluvialis

First discovered in the UK in a woodland in Cornwall in September 2021, *P. pluvialis* is a fungus-like pathogen that affects a variety of soft conifers including western hemlock, radiata pine and Douglas fir. Further investigations are ongoing to identify the spread and severity of this pathogen, but cases have already been confirmed in Devon, Cumbria, Surrey, Shropshire, and at multiple sites in both Scotland and Wales.

Great spruce bark beetle (*Dendroctonus micans*)

D. micans is a common pest of spruce and pine in mainland Europe but is not native to the UK. It tunnels into the bark of living trees to lay its eggs. The larvae then feed and develop, forming galleries that weaken, and in some cases kill, the host tree. It is now an established pest in southern Scotland and is slowly extending its range northwards. The beetle is a capable flyer but long-distance spread is also known to occur through the movement of infested roundwood. The *D. micans* distribution map(<https://forestry.gov.scot/publications/1385-updated-d-micans-distribution-map-in-scotland-january-2022/download>) in Scotland shows the Pest Free Area and the latest confirmed distribution of *D. micans* in Scotland. Scottish Forestry are working with the timber sector to promote the 'Ditch the Debris' message to reduce the risk of moving infested material into the Pest Free Area via timber haulage.

Woodland and Shelter

Trees and woodland can provide valuable protection from wind and driving rain which can:

- reduce lamb and ewe mortality resulting from evaporative chilling
- increase weight gain in livestock
- increase milk yields in cows
- improve livestock health and condition
- reduce feed costs
- reduce evapotranspiration of pasture and crops
- protect light soils
- increase soil organic matter content

Woods can act as a wind shield or a wind break, depending on the porosity of the wood. These principles are set out below:

Wind Shield

- Virtually impermeable woodland (<40% porosity)
- Reduces wind speed by up to 90%
- Wind speed reduction over distance of up to 10 times tree height from lee side of forest
- Greatest shelter within distance of 3 to 5 times of tree height
- Completely stops wind within small area; high turbulence in field
- Best for livestock protection

Wind Break

- Permeable woodland (40-60% porosity)
- Reduces wind speed by up to 70%
- Wind speed reduction over distance of 20-30 times tree height from lee side of forest
- Achieves reduced wind speeds across large area
- Little turbulence well above ground
- Best for crops and silage

More information on the principles of using woods for shelter can be found here: <https://cdn.forestresearch.gov.uk/2006/03/fcin081.pdf>

Scottish Timber Log Prices

The table below provides a comparison of Scottish timber prices from June 2024. These values are representative of prices offered for clear fell harvesting only; lower prices will be offered for thinning operations.

Prices vary according to market conditions, quality of timber, total volume harvested, ease of access and transport cost. Values are given in £/t, sold on an out-turn tonnage basis. Roadside sales are net of harvesting costs, while standing sales are net of harvesting and haulage costs and represent the gross margin of that crop.

Species	Log Type	Price (£/t)	
		Roadside	Standing
Larch	Logs	55-65	30-45
Scots Pine	Logs	55-65	30-45
Sitka Spruce	Green Logs	70-80	35-55
Sitka Spruce	Pallet wood	60-70	25-30
Mixed Conifer	Chipwood or Pulp	45-60	25-35
Lodgepole Pine	Logs	45	20
Mixed Conifer	Slats	55	30
Hardwood Logs	Various	70	45

The following link connects to Forest Research Timber Price Index data to March 2024: <https://cdn.forestresearch.gov.uk/2024/05/TPI052024.pdf>

Timber crop values at clear fell range considerably, with high quality crops usually selling well. Estimated standing sale timber values for Sitka spruce (yield class 16, appropriately thinned) felled at 45 years old can be anywhere from £6,000 to £22,000/ha.

Woodland owners increasingly keep part of the timber harvested for their own use for woodfuel. The cost to harvest and extract small round-wood to roadside is typically in the range £12-30 per tonne. Price can depend on volume per ha, size of area, and distance from stacking area.

Financial Assistance for Farm Woodlands

Financial assistance for the creation and maintenance of forestry and farm woodlands is supported through the Forestry Grant Scheme (FGS).

The FGS is entirely administered, except for payments, by Scottish Forestry. Payments are made by Rural Payments and Services (RP&S) Full details of the FGS can be found at:

<https://www.ruralpayments.org/publicsite/futures/topics/all-schemes/forestry-grant-scheme/>.

The following information has been adapted from the above website to give an overview of the scheme options. Applicants should refer to the full scheme guidance as revisions are likely and applicants should always check for the latest updates.

Forestry activity is supported under eight categories and these are:

1. Woodland Creation
2. Agroforestry
3. Woodland Improvement Grant
4. Sustainable Management of Forests
5. Tree Health
6. Harvesting and Processing
7. Forest Infrastructure
8. Forestry Co-operation

Woodland creation

Grants for woodland creation largely continue as they have since 2015. These can be very attractive for planting of a significant scale especially for timber-producing woodlands. 50-60% of new planting tends to be of productive woodlands. Demand for Woodland Creation grants continues to be very high, with contracts already approved and budget allocated for many 2024/25 projects already. The budget for woodland creation for 2024/25 has been reduced from £45m to £25.3m. This will reduce the estimated number of hectares planted for 2024/25 by approximately 9,000 ha.

FGS offers a per-hectare payment for initial planting, which varies depending what type of woodland you want to grow (the nine options are listed below). Capital payments are available for items required to establish the woodland, including fencing, tree shelters, bracken control, and gorse removal. An annual maintenance payment is paid per-hectare and claimed on the Single Application Form (SAF) for five years. You can continue to claim Basic Payment on land planted under the scheme.

Small Woodlands Loan Scheme

Scottish Forestry has introduced a loan scheme to help with the costs of establishing Woodland Creation projects. FGS funding is paid after initial operations are complete, typically three months from when a claim is submitted. The loan can provide 50% of the value of capital items up front, acting as a partial bridging loan in the time between the work being done and the grant funding being paid. Woodland creation schemes up to 50ha are eligible, up to a maximum value of £40,000 per application. More accurately, this should be called a down payment. Interest will be charged if you **don't** go ahead with the scheme.

Sheep and Trees

The Sheep and Trees initiative is aimed at supporting upland sheep farmers to grow a timber crop while continuing to farm livestock (where sheep are a major component). This package offers funding for forest infrastructure, such as new road building, along with woodland creation. Forest Infrastructure grant can be claimed when planting between 10 and 50ha under the Conifer or Diverse Conifer options in blocks of at least 10ha.

Woodland Creation Options and Grant Rates

There are nine options for woodland creation, each with specific requirements for composition and stocking densities:

1. Conifer – timber crops of predominantly Sitka spruce.
2. Diverse Conifer – timber crops of species other than Sitka spruce.
3. Broadleaves – grown at high stocking density to produce hardwood timber.
4. Native Scots Pine – native pinewood habitat creation or expansion.
5. Native Upland Birch – low-density downy birch habitat on shallow peaty soils (<50cm depth).
6. Native Broadleaves – other native woodlands, mainly lowland habitat types.
7. Native Low-density Broadleaves – specific native woodland or scrub habitats such as transition zones between woodlands and open hill.
8. Small or Farm Woodland – mixed broadleaved and conifer woodlands less than 10ha, no individual block more than 5ha.
9. Native Broadleaves in Northern and Western Isles – native woodland habitats in high exposure areas on the islands or elsewhere within the crofting counties.

A higher rate of grant is payable in four target areas:

1. Conifer, Diverse Conifer or Broadleaves in areas defined as being preferred or potential in the relevant local authority woodland strategy or equivalent.

2. Areas identified by the Cairngorms National Park Authority as a priority for woodland expansion, for predominately Scots pine or native broadleaved options.
3. Woodlands for Water, in priority areas identified by SEPA, for all options other than the Conifer option.
4. Native woodland options within the area identified as the Highland Native Woodland Target area.

A capital grant is available for using vegetatively propagated genetically-improved Sitka spruce. This is to encourage use of the most productive plants to grow high-yielding timber crops.

The Central Scotland Green Network (CSGN) offers an additional capital item payment for woodland creation schemes within the CSGN area of central Scotland. Different payment rates per hectare are offered within the Core, Outer Core and Fringe areas. These CSGN areas are shown on Scottish Forestry's Map Viewer:

<https://scottishforestry.maps.arcgis.com/apps/webappviewer/index.html?id=0d6125cfe892439ab0e5d0b74d9acc18>

From the dropdown menu select FGS Target and Eligibility Area and then FGS Target CSGN Contribution area. The planting grants and capital grants applicable to the woodland creation scheme are as follows:

Planting Grant	Payment rate (£/ha)		
	<i>Initial Planting</i>	<i>Annual Maintenance</i>	<i>Total for 5 yrs</i>
Standard Areas			
Conifer*	1,920	208	2,960
Diverse conifer*	2,160	336	3,840
Broadleaves*	2,880	528	5,520
Native Scots Pine	1,840	272	3,200
Native upland birch	1,840	128	2,480
Native broadleaves	1,840	272	3,200
Native low-density broadleaves	560	96	1,040
Small or farm woodland*	2,400	400	4,400
Native Broadleaves in Northern and Western Isles	3,600	624	6,720
Target Areas			
Conifer	2,160	234	3,330
Diverse conifer	2,430	378	4,320
Broadleaves	3,240	594	6,210
Native Scots Pine	2,070	306	3,600
Native upland birch	2,070	144	2,790
Native broadleaves	2,070	306	3,600
Native low-density broadleaves	630	108	1,170
Small or farm woodland	2,700	450	4,950
Native Broadleaves in Northern and Western Isles	4,050	702	7,560

* Where ploughing is the agreed method of ground preparation, the Initial planting payment rate is reduced by £240/ha for the Conifer option, £270/ha for the Diverse conifer option, £360/ha for the Broadleaved option and £300/ha for the Small or Farm Woodland option.

Capital Item Grant	Payment rate
CSGN – Core Area Contribution	£2500/ha
CSGN – Out Core Area Contribution	£1500/ha
CSGN – Fringe Area Contribution*	£750/ha
Genetically improved Sitka Spruce	£150/ha
Stock fence	£4.40/m
March stock fence	£2.75/m
Deer fence**	£7.60/m
Deer fence - high cost**	£9.90/m
Upgrading stock fence to deer fence	£3.28/m
Rabbit-proofing stock or deer fence	£1.60/m
Tree shelter: 1.2 to 1.8 metres	£2.00 each
Tree shelter: 0.6 to 1.1 metres	£1.16 each
Vole guard	£0.19 each
Enhancing or modifying a stock fence - Black Grouse and Capercaillie core areas	£2.00/m
Enhancing or modifying a deer fence	
- Low cost Black Grouse/Capercaillie core areas	£2.00/m
- High cost Black Grouse/Capercaillie core areas	£4.48/m
Conversion of deer fence to stock fence Black Grouse and Capercaillie core areas	£1.60/m
Gate for stock fence	£136 each
Gate for deer fence	£172 each
Badger gate	£64 each
Self-closing gate for non-vehicular access	£280 each
Building or restoring drystone dykes	£26.40/sq. m
Bracken control, mechanical or chemical removal***	£225/ha
Gorse removal***	£720/ha

* Fridge Payment can now be claimed for anyone outside the CSGN area.

** High rate can now be claimed across all of Scotland.

*** Gorse removal is now claimed for bracken mechanical control only.

Demand for Woodland Creation grants is high and has been increasing for the past few years. Applications for FGS can be submitted all year round but funding runs from April each year and becomes increasingly competitive as contracts are approved and budget allocated. Applications are scored on how well they will deliver Scottish Forestry's objectives.

Scottish Forestry pay particular attention to the 'value for money' of proposed schemes. Those with a total grant value (including 5 years of maintenance payments but excluding any CSGN contribution and basic payments) of greater than £6000/ha are classed as 'high cost' schemes.

There is a smaller pool of money available for these schemes and grant funding is therefore more competitive. It is usually necessary to demonstrate a significant level of public benefit.

Fencing is generally considered the preferred method of protecting a new woodland. At scale, fencing is also usually cheaper than using individual tree shelters. Scottish Forestry may support tree shelters if using them will cost less than fencing.

Income from sales of carbon credits is playing an increasingly important role in making certain types of woodland creation schemes financially viable. One condition of carbon funding is the 'additionality rule' – the income from selling carbon credits must be essential to allow the project to go ahead. In October 2022 new rules came into place and now schemes need to pass a new cashflow spreadsheet that has standard cost and incomes for all items. Once you have filled in the spreadsheet, it will tell you if the project Passes or Fails.

Per-tonne of carbon dioxide equivalent (CO₂e) rates for sales of carbon credits have increased during the last 12 months but can vary widely from £8/tCO₂e to in excess of £25/tCO₂e. For more information on Carbon values, please refer to page 331.

When planning farm woodlands it is important to consider other benefits and costs. For example:

- Additional benefits can include shelter, conservation, sporting, amenity and carbon sequestration, the latter seeing dramatic price rises between 2020 and 2023. See pages 326-328 for further information on forestry and climate change.
- The loss of agricultural production from the land is an opportunity cost and this can be minimised by planting less productive land, such as where bracken has established. If a significant proportion of the farm is planted, it may be possible to reduce fixed costs.
- Potentially, one of the largest financial impacts is the effect on land values. Generally, the more productive the land that is planted with trees, the greater the potential loss in capital value. In some circumstances capital values can be improved by new woodland, for example through better shelter, amenity, or sporting.

Woodland Improvement Grant

This grant aims to support forest management, activity to enhance the environment, and improve public access to existing woodlands. There are five options in this category:

1. Habitats and Species
2. Restructuring Regeneration
3. Low Impact Silvicultural Systems (LISS)
4. Woodlands In and Around Towns (WIAT)

5. Planning including Long-term Forest Plan, Forest Plan Renewal, Woodland Grazing Plan, WIAT Urban Woodland Management Plan and Deer Management Plan.

Grant payments for options under the Woodland Improvement Grant are as follows:

Option	Grant payment
Habitats and Species	Standard costs for capital works and items from a set list. Actual costs are available for work in woodland SSSI and Natura sites where it can be demonstrated that the actual costs of the eligible capital items will be higher than the set standard costs list for this option
LISS	Standard costs for capital works and items from a set list
WIAT	Standard costs for capital works and items from a set list
Long-term Forest Plan	£25/ha for first 200ha, £5/ha thereafter (minimum £500; maximum £15,000)
Forest Plan Renewal	£10/ha for first 200ha, £5/ha thereafter (minimum £500; maximum £10,000)
Woodland Grazing Management Plan	£1,200 per plan
WIAT Urban Woodland Management Plan	£1,000 for any area up to 10ha, £25/ha thereafter
Deer Management Plan	£12/ha for first 500ha, £1/ha thereafter (minimum £5,000; maximum £15,000)

Payments for restocking, (known as restructuring regeneration) comprise a single capital payment. An approved long-term Forest Plan or Woodland Management Plan must be in place to be eligible for these grants. The payments are:

Delivering UKFS Woodland (no more than 75% of area as a single species)	£300/ha
Delivering Diversity and Resilience Woodland (no more than 60% of area as a single species)	£550/ha
Improved Vegetative Stock for Sitka Spruce	£60/ha

Sustainable Management of Forests

These grants support a range of activities in existing woodlands that will:

- Increase species and structural diversity through Low Impact Silvicultural Systems (LISS) management.

- Encourage natural regeneration to expand native woodlands.
- Bring native woodlands and designated woodland features into active management and good ecological condition.
- Support management of rural and urban woodlands for public access.
- Control grey squirrels where they are a threat to the red squirrel population.
- Control predators to benefit Capercaillie and Black Grouse.
- Reduce deer impacts to a level that will allow regeneration of conifer and broadleaved species.

The grant support for this category comprises nine options. All payments are made for up to a maximum of five years. An approved Long-Term Forest Plan (LTFP) or Woodland Management Plan must be in place to be eligible for these grants. Approved Deer Management Plans and/or Woodland Grazing Plans may also be required to be eligible for some options.

Grant	Payment rate
Low Impact Silvicultural Systems (LISS)	£30/ha/yr
Native Woodlands	£25/ha/yr
Livestock Exclusion	£43/ha/yr
Woodland Grazing	£100/ha/yr
Public Access – Rural Woods	£100/ha/yr
Public Access – Woods In and Around Towns (WIAT)	£100/ha/yr for first 10ha £10/ha/yr for any additional areas
Grey Squirrel Control	£200 per trap/yr
Predator Control for Capercaillie and Black Grouse	£6.60/ha/yr
Reducing Deer Impact	£6.00/ha/yr

Forest Infrastructure

This option has two aims:

1. Existing Woodlands - To provide support for new access infrastructure that will bring small-scale, undermanaged woodlands or inaccessible woodlands back into active management to improve the economic value of forest and woodland through timber production, to increase the area of woodland in Scotland that is in sustainable management and to improve the environmental and social benefits of woodland. This option is limited to woodlands of up to 50 hectares in size.
2. Sheep and Trees - To provide support for new access infrastructure to new woodlands as part of the Sheep and Trees initiative. This initiative is aimed at raising awareness of the many opportunities woodland can bring to land managers. This option, as part of the Sheep and Trees grant package, is only available for upland livestock farmers when creating between 10ha and 50ha of productive Conifer or Diverse Conifer woodland and is limited to up to 30m per hectare planted, with a cap of 1,500m per application.

Grant support is available for several capital grant operations associated with construction of new forest infrastructure:

Grant	Payment rate
Forest road with on-site material *	£25.80 per linear metre
Lay-bys, turning areas, and loading bays	£6.60 per square metre
Bell-mouth junction **	£32.40 per square metre

* in the Sheep and Trees option allowance of up to 30 metres/ha of woodland creation (cap of 1,500 metres/application)

** not available for the Sheep and Trees option

Agroforestry

Agroforestry can be described as an integrated approach to land management, where trees and agriculture co-exist to provide multiple benefits. This option provides grant support to help create small-scale woodlands within sheep and cattle grazing pasture. These trees can:

1. provide shelter for livestock
2. provide timber
3. increase biodiversity
4. enhance the landscape

This grant has two payment types:

- a capital grant for initial establishment
- an annual maintenance grant that is paid for five years

The rate of capital grant that can be claimed depends on the number of trees that are planted per hectare. Two stocking levels and grant rates are available:

Planting density	Initial payment	Annual maintenance
300-400 trees/ha	£5,400/ha	£126/ha/yr
150-200 trees/ha	£2790/ha	£72/ha/yr

The rate per hectare has been set to cover:

- purchase of trees and stakes
- purchase or construction of appropriate protection
- planning, site assessment, supervision, ground preparation, and planting

A contribution is also included to the cost of beating-up and weeding.

Tree Health

This option provides support to prevent the spread of larch disease, *Phytophthora ramorum* (see page 311 for more information on the disease itself).

This option helps with the restoration of forests affected by the disease by supporting the work to remove infected trees and carry out subsequent replanting.

Grant support consists of a number of standard cost capital items. These are available for work to help prevent the spread of disease and restore affected woodlands. The eligible items and payment rates for eligible operations on infected land are listed in the following table:

Grant	Payment
Agent services - Advisory	£200
Agent services - Compliance	£500
Agent services - Harvesting and marketing	£1,000
Tree clearance (clearing saw)	
- Larch under 26 years - first 5ha	£600/ha
- Larch under 26 years - >5ha up to 10ha	£450/ha
- Larch under 26 years - >10ha	£300/ha
Tree clearance (other mechanised equipment)	
- Larch under 26 years - first 5ha	£1,200/ha
- Larch under 26 years - >5ha up to 10ha	£900/ha
- Larch under 26 years - >10ha	£600/ha
Un-economic felling	
- Larch on Islands - first 5ha	£2,400/ha
- Larch older than 26 years - first 5ha	£1,200/ha
- Larch greater than 26 years - >5ha up to 10ha	£900/ha
- Larch greater than 26 years - >10ha	£600/ha
Restocking - Delivering Diversity and Resilience in Woodlands	£1,400/ha
Manual Rhododendron Eradication	
- Light	£3,500/ha
- Medium	£5,500/ha
- Difficult	£7,300/ha
Mechanised Rhododendron Eradication	
- Light	£2,200/ha
- Medium	£3,400/ha
- Difficult	£5,600/ha
Foliar Spray Treatment Rhododendron Eradication	£200/ha
Follow-up Rhododendron Eradication	£200/ha
Stem Injection Rhododendron Eradication	
- Medium	£3,000/ha
- Difficult	£4,500/ha

Harvesting and Processing

This option supports investments in three main areas:

1. New specialised equipment which will increase the local small-scale harvesting and processing capacity with the aim of:
 - helping to bring woodlands into management
 - promoting the economic and sustainable production of timber and timber products through processing
 - adding value to local economies on a non-industrial scale processing (less than 10,000 tonnes per annum), primary timber

- processing (less than 5,000 tonnes per annum), secondary processing equipment (less than 500 cubic metres per annum)
 - providing support to facilitate and support diversification and to assist with the creation of new small-scale enterprises and related employment.
2. New specialised equipment for forest tree nurseries (including tree nurseries in England and Wales) and ground preparation and fencing equipment for afforestation projects with the aim of:
 - promoting economic development in rural areas in Scotland by supporting new and existing forestry businesses
 - scaling up and expanding the capacity within the forest tree nursery sector and the forestry contractor resource to help delivery of the Scottish Government ambitious woodland creation target
 - helping forest nurseries to adapt, become more resilient and recover from COVID-19.
 3. Support for the mobile equipment to help forestry businesses or enterprises to adapt and recover from COVID-19, with the aim of:
 - promoting economic development in rural areas in Scotland by supporting new and existing forestry businesses.

Grant support is based on actual costs with a maximum contribution of 40%. The balance of funding must come from private funds and not from other public funds. Public funds include all EU funds, and any UK government funds, including local authority and lottery grants. In any single application, the minimum and maximum grant award totals will be:

- Aim 1 – harvesting and primary processing equipment minimum £2,500 and maximum £50,000
- Aim 1 – secondary processing equipment minimum £1,000 and maximum £6,000
- Aim 2 – nursery and ground prep equipment minimum £2,500 and maximum £50,000
- Aim 3 - mobile equipment to help adapt and recover from Covid-19 minimum £2,500 and maximum £50,000

One application round will be run each year with a closing date of 31 January for the submission of applications. Applications with a claim year of 2022 must spend grant awards by the end of March 2023.

The grant cannot be used for purchase of chippers or second-hand equipment. A business case must be submitted as part of the grant application.

Forestry Co-operation

This option aims to encourage landscape-scale collaborative projects between two or more landowners by providing support for project facilitation and co-ordination. The subsequent management activity can be supported through other options within the Forestry Grant Scheme.

Grant support of £250 per day is available for up to 40 days to support the cost of a project co-ordinator for the following stages of a project:

- Feasibility – this stage is the initial exploratory phase
- Consolidation – this stage focusses on the detail of the project.

Trees and Taxation

Forestry enjoys several benefits in relation to taxation. Their value to stimulating the forestry sector was recognised in the Land Reform Review in 2014. Taxation considerations for forestry are listed below:

Income Tax - Currently, profits arising from the commercial occupation of woodlands are not chargeable to Income Tax and Corporation Tax and the value attributable to trees is exempt from Capital Gains Tax. The sale of voluntary carbon credits as of 1 September 2024 VAT will be charged on all transactions unless it is exempt. However, applicants should always seek professional independent advice based on their specific circumstances.

Capital Gains Tax (CGT) - There is no CGT applied to the gain in value of commercial trees. CGT does however apply to a gain in value on the land.

Inheritance Tax (IHT) - Where commercial woodland has been in individual ownership for at least two years, it will normally attract 100% IHT Business Property Relief.

Corporation Tax (CT) - Where a company owns woodland which is independent of their trading operations, there is no CT liability on income generated by timber sales or surplus resulting from forestry grants.

For more detail see the Taxation section on page 515.

Forestry and Climate Change

Afforestation is one of the methods by which climate change reduction targets can be achieved. For each new hectare of forest and woodland created, it is estimated that, on average, seven tonnes of CO₂ will be removed from the atmosphere each year. The Climate Change Plan includes commitments to incrementally increase the annual woodland creation target from 12 000 to 18 000 ha per year by 2024/25. Scotland's forests cover is currently 19% of the total land mass area. The Scottish Government's forestry strategy aim is to increase this to 21 % by 2032.

Growing trees act as a carbon sink, sequestering carbon dioxide from the atmosphere and converting it to wood. This carbon remains locked away as long as the timber is used in construction, fencing or other wood products.

The total carbon stock in UK Forests is estimated to have increased to 4.0 billion tonnes of carbon dioxide equivalent in 2020, up from around 3.2 billion tonnes of carbon dioxide equivalent in 1990. Of this 4 billion tonnes CO₂e, over half (51%, 2.0 billion tCO₂e) is sequestered in Scotland's forestry stock.

The permanent planting of trees (not Christmas trees) on agricultural land will result in net sequestration of carbon. Deep peats (greater than 50cm deep) should not be planted as peat itself sequesters carbon and planting it with trees would cease its function as such. Similarly, evidence suggests that maximum C-sequestration benefits on a per-hectare-basis might be achieved on the highly productive lowland areas, although potentially at a high agricultural opportunity cost. Agroforestry, where trees are planted in a way that allows the land is to be kept in agricultural production may be an option here. Scotland-wide, significant benefits are also possible on the less productive lands, by avoiding disturbance of organic soil layers.

Carbon value

Tree planting on agricultural land will contribute to reducing a farm's carbon-footprint, where:

- It is a permanent change in land use.
- The planting conforms to the UK Forestry Standard.
- The risks to the planting and the accuracy of sequestration predictions are considered.

New woodland may qualify for payments under a carbon brokerage scheme (the Woodland Carbon Code – WCC), as long as it passes the financial additionality through the standard Cashflow Spreadsheet to show that the creation of the woodland would not have happened without the assistance of the WCC.

Current payments for new planting range dramatically dependent on species, contract period, location and management regime. Values offered vary significantly between projects, as it is often the case that the carbon value of a woodland scheme is also linked by investors to the diverse range of other benefits a site may deliver, for example, a native broadleaved scheme which reduces flood risk for an area would likely achieve significantly higher carbon values than a commercial conifer monoculture plantation.

Carbon Credit values have risen significantly from 2021 into 2023 as more businesses and individuals look to reduce the environmental impact of their activities as part of efforts to work towards 'net zero' targets and wider Environmental, Social and Governance (ESG) principles, and as growing awareness of climate change also starts to influence public perception of greenhouse gas emissions and a shift towards sustainable living. More businesses and individuals are looking to offset their own emissions, and woodland creation is playing a huge part in this move as

an affordable and sustainable approach to offsetting emissions whilst also delivering a multitude of biodiversity and landscape benefits.

To the end of June 2024, a total of 2,151 projects had been registered under the Woodland Carbon Code, covering around 81 thousand hectares of woodland with a projected total sequestration of 27 million tonnes of carbon dioxide over the lifetime of these projects.

Wood fuel

Wood can be used as a renewable heat source and is usually sold to the customer as logs, chips or pellets. Woodland owners can sell smaller sized roundwood as logs. Values vary according to whether the wood is soft wood (conifer) or hard wood (broadleaf); for log prices see page 315.

Standing and lying deadwood can be of considerable ecological value, it may also have a lower calorific value than 'live' wood. Where it is safe to do so, deadwood should be left in the forest.

Short Rotation Forestry (SRF) is a system for producing woody biomass for renewable energy projects. It is exempt from Scottish Forestry Woodland Creation grant funding. For more information on this system and biomass heating, see pages 360 and 354-355.

Woodland as pollution control

Native riparian woodland can provide an effective buffer against diffuse pollution. Woodland acts as a buffer reducing the risk of surface run-off, leaching, spray pesticide drift and fertilisers entering the watercourse. Trees can reduce the risk of erosion and when fenced can help prevent stock from entering the water courses.

Woodland as flood control

Forests and woodlands can slow down and reduce levels of flooding downstream. The forest canopy slows the rate at which rain reaches the ground, tree roots make the soil more porous and therefore more able to retain water (together with generally higher organic content than outside the forest), and transpiration of water from the soil.

Species choice for woodland creation

Sitka spruce, comprising over 60% of the national timber crop, has traditionally been favoured for its rapid growth and great adaptability. It is however a high-rainfall species, requiring over 2m of rain per year. On the drier east coast, the incidence of drought crack in Sitka spruce, which makes otherwise valuable timber worthless, is increasing as the climate becomes drier and warmer. Greater species diversity is therefore required, placing emphasis on more suitable species such as Norway Spruce, Scots Pine and Hybrid Spruce. Although slower growing and lower yielding than Sitka spruce, the long-term view should be taken, establishing trees which in decades ahead will be tolerant of drier and warmer conditions and still produce good quality timber.

Carbon

Climate change, carbon, and the environment

It is now widely accepted that all businesses, including farms will have to take action to reduce greenhouse gas emissions responsible for driving climate change.

Scottish Government have set the target of achieving net zero emissions by 2045, and while they announced in April 2024 that the interim target of a 75% reduction by 2030 (from 1990 levels) has been scrapped, a system of greenhouse gas (GHG) reporting will be implemented every five years.

Agricultural production is underpinned by natural biological processes, which in turn give rise to greenhouse gases. With around 7.8 MtCO₂e (million tonnes CO₂ equivalent) of greenhouse gases attributed to the agricultural sector in 2021, in terms of contributions to total Scottish greenhouse gas emissions it is now the second largest contributor by industry sector, behind transport (10.9MtCO₂e) (Scottish Government, 2024).

Agricultural greenhouse gas emissions

There are three main greenhouse gases produced through routine agricultural activities:

- Carbon dioxide (CO₂) is produced by burning fossil fuels such as coal, oil, and diesel.
- Methane (CH₄) is produced as a natural by-product of enteric fermentation during ruminant digestion and, to a lesser extent, from management of organic manure.
- Nitrous oxide (N₂O) which is released during the application of synthetic and organic fertilisers to the soil, from urine deposition by grazing animals, soil cultivation and changes in land use and vegetation.

Greenhouse gases, their global warming potential (GWP) and contribution to Scotland's GHG emissions, 2021

Greenhouse gas	GWP (over 100 year period) per kg emitted	% of Scotland's net GHG emissions in 2021 (in MtCO ₂ e)
Carbon dioxide (CO ₂)	1	66.0%
Methane (CH ₄)	25	24.5%
Nitrous oxide (N ₂ O)	298	7.2%

Greenhouse gases are typically quantified in terms of CO₂ equivalents (CO₂e) based on their relative global warming potential (GWP) over a 100-year period. The table above provides an approximate assessment

of the GWP of the main three greenhouse gases and includes their percentage contribution to Scotland's net greenhouse gas emissions in 2021.

By expressing emissions in terms of CO₂ equivalents, it allows groups of greenhouse gases to be quantified as a single number allowing cross sector and year-on-year results to be easily compared.

Agriculture as part of the solution to climate change

As other sectors cut their emissions, it is anticipated that the contributions from farming activities will gain more prominence. However, the agricultural sector has the potential to be part of the solution to climate change.

Through ongoing improvement of technical efficiency and using new technologies and techniques, alongside implementing land management practices which can store or 'sequester' carbon removing it from the atmosphere and locking it into soils, vegetation and trees, the agricultural sector has a key role to play.

More information on practical mitigation measures and steps farmers are taking to reduce emissions and sequester carbon is available on the Farm Advisory Service website (www.fas.scot).

Preparing for Sustainable Farming

Against the backdrop of biodiversity losses and a changing climate, Scottish Government aims to support farming and food production to be a global leader in sustainable and regenerative agriculture through a twin track approach. Under Track 1 of the National Test Programme, Preparing for Sustainable Farming (PSF) programme provides funding for soil sampling, carbon audits and animal health and welfare interventions. The scheme will run until March 2025.

For more information see:

www.ruralpayments.org/topics/all-schemes/preparing-for-sustainable-farming--psf/

From 2025, a four-tier support system is proposed, with tier 1 providing base support (with environmental conditionality), tier 2 providing enhanced support including additional payments for climate, nature and biodiversity outcomes, and tiers 3 and 4 providing support for a range of additional and targeted environmental, social and business initiatives (see www.ruralpayments.org/topics/agricultural-reform-programme/arp-route-map/).

FAS Carbon and Climate

This updated section of the Farm Advisory Service website provides a range of information and resources on carbon management on farms and outlines what climate change means for agriculture in Scotland. The website hosts a range of practical guides, podcasts, videos, and farmer case studies showing how other farmers are reducing their farm carbon

footprint. Topics covered include optimising enterprise productivity, managing energy and fuel use, increasing carbon sequestration, carbon markets, how to complete a carbon audit, use of technology and tools to support decision-making, and a new 'carbon calendar' with reminders of relevant deadlines and actions throughout the year.

The section also now incorporates guidance and case studies from the Farming for a Better Climate programme, funded by the Scottish



Government and delivered by SAC Consulting. The programme worked with farmers to find practical and profitable solutions, tips, and ideas to improve business efficiency, reduce greenhouse gas losses from the farm and help farmers and land managers adapt to a changing climate.

Farm carbon calculators and carbon footprinting

Farm carbon calculators are highly useful business tools, not only for understanding carbon management within the business, but also helping determine relative resource use and efficiency across the business. Often the farms with the lowest carbon emissions are also the most productive and profitable within their sector, so carbon footprints can help a farm to save money and improve performance.

Typically farm carbon calculators will ask for information on:

- Crop areas and yields
- Livestock numbers and productivity
- Input use (feed, fertilisers, bedding, pesticides etc.)
- Electricity and fuel use
- Manure and fertiliser management

Some tools also ask for information on land use and farm practices to provide a soil carbon sequestration figure.

A farm carbon assessment involves:

1. Calculating an initial carbon footprint measurement.
2. Benchmarking
3. Identifying mitigation (positive change) measures.
4. Monitoring and reviewing.

1. Calculating an initial (baseline) carbon footprint

This will provide a 'starting point' to help to understand current practices and productivity and to provide a baseline to monitor progress. The more accurate a business is when inputting data, the greater the accuracy of the carbon footprint.

For up-to-date advice on funding available for carrying out a carbon audit and getting advice from an expert, visit the Farm Advisory Service website: www.fas.scot/carbon-audits/.

2. Carbon footprint benchmarking

Benchmarking a baseline carbon assessment will enable businesses to compare their farm enterprises to other similar farms, to identify high emissions areas, and opportunities for mitigations and optimising resource use.

As shown in the sample report, Agrecalc's benchmarking facility can provide businesses with an indication of whether the performance of an individual enterprise is above or below average and can highlight areas where improvements can be made. The quick glance enterprise emissions report benchmarks a business's enterprise emissions broken down by source against similar farms, together with the 'opportunity level' for improvement.



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Anna Test Farm > Agrecalc Reports

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Agrecalc

Report - Agricultural Resource Efficiency

Please note - the following benchmark tables and charts do not yet include soil carbon sequestration. This will be added soon once sufficient benchmark data is available.

Sector: Beef

Region

Enterprise type: Spring calving upland suckler cows

Year calc relates: End Dec 2020

System: Breeder/store

Reporting date: 28th Jun 2021

Group:

Report reference:

Producer:

Compared to: Beef Enterprises (system specific) 2017 to 2021

Farm: Test Farm

(1433) reports

System Admin's Menu

- » All Farms
- » Benchmarking

Farm Menu

Test Farm

- » Farm Home
- » Edit Farm Details
- » Farm Report Data Entry
- » Results
 - » Resource use and Emissions
 - » Comparisons
 - » Year on Year Results
 - » Charts
 - » Agrecalc Reports

Quick glance enterprise emissions				Physical performance of enterprise		
	* kg CO ₂ e/kg dwt	Opportunity Level	Comparison		Value	Comparison
Enteric fermentation	17.87	Low	22.23	Area of land utilised (ha)	97	202
Manure management	6.66	Low	9.41	Female breeding stock (no)	127	109
Fertiliser	6.16	Medium	5.07	Heifer sale weight (kg lwt/head)	444	450
Purchased feed	2.31	Medium	2.29	Steer sale weight (kg lwt/head)	481	468
				Young bulls sale weight (kg lwt)		653
				Purchased feed use (kg/cow)	689	1,418
				Homegrown fodder use (kg/cow)	7,559	9,624

3. Identifying suitable mitigation measures

Mitigation measures fall into 3 categories:

1. Avoiding or reducing emissions through improving efficiency and or work practices.
2. Reducing or eliminating through changing inputs e.g., switching to renewable energy sources.
3. Sequestering or offsetting emissions.

Effective mitigation strategies for one farm may not be effective on another farm, so specialist advice from a farm advisor may be helpful to identify actions that are best suited to the individual farm and to identify short-term and longer-term options.

Mitigation measures can include:

- Looking at most significant emissions sources on the farm and in comparison to other farms.
- Identifying easy changes e.g., switching an input for one with lower associated emissions or finding ways to reduce energy/fuel use.
- Focusing on 'win-wins' that will provide resource and cost savings as well as carbon savings, such as precision feeding of livestock. The Marginal Abatement Cost Curve, produced by SRUC researchers, provides substantial detail into the cost-effectiveness of selected mitigation measures.
- Investigating funding schemes, as further details on programmes within the new four-tier framework of future support are announced.
- The baseline carbon results to test out potential impact of different measures e.g., finishing cattle earlier, can be a useful tool when creating a carbon plan for the business going forward.

The Farming for a Better Climate website provides advice and resources for farmers wishing to assess and improve their carbon footprint.

4. Monitor and review

After new practices and measures have been implemented, repeating the carbon assessment process helps to monitor and review progress. Carrying out a second audit a year or two later will allow a business to assess the impact of the 'easy wins', but for more involved practices and system changes waiting three to five years may be more appropriate.

Choosing the most appropriate carbon calculator

As there are various farm carbon calculators in the UK that will generate a farm carbon footprint with differing methodologies, outputs, and features – which one should you choose? All carbon calculators are essentially computer models, and how they calculate emissions varies according to the underlying calculations and assumptions made. The more detailed the data input, the more accurate the result. For an comparison of the key farm greenhouse gas calculators see online at: <https://www.climatexchange.org.uk/research/projects/comparative-analysis-of-farm-based-carbon-audits/>

The key questions to consider when choosing a farm carbon calculator are:

- What data does it ask for? Do you have this data readily available in your farm records?
- Are the results presented in a way that is useful to you and will help inform business decisions? Are you interested in whole farm results, individual enterprise results, or both?
- Does the tool enable you to benchmark against other similar farms?

- What standards and methodology are used? Calculators based on IPCC (Intergovernmental Panel on Climate Change) guidelines are considered more scientifically rigorous, and certification such as PAS 2050 means it has been reviewed and verified by a third party on its use of the internationally applicable method for quantifying product carbon footprints.
- Does your buyer e.g., milk company or your participation in a particular grant or business support scheme require or recommend that you use a particular carbon calculator?

Once you have chosen your carbon footprinting tool, it is best to stick with the same one to make it easier to compare your progress year on year.

Farm carbon accounting and the National Inventory

A crucial principle of farm carbon footprinting is that it calculates only the emissions associated with agricultural activities on the land, not overall emissions from the land itself. To be able to measure, monitor and benchmark with consistency and to identify areas for efficiency and resource use improvement, it is necessary to separate out natural cycles of greenhouse gases from land and those resulting from agricultural activity.

Due to how carbon is accounted on a national scale in the UK's Greenhouse Gas Inventory, farm woodlands and renewables are classified as non-agricultural activities. This means that the carbon benefit is attributed to LULUCF (Land Use, Land Use Change and Forestry) and Energy sectors respectively.

However, some carbon tools, such as Agrecalc, calculate carbon sequestration from woodlands and soil carbon, and energy generated by on-farm renewables, in addition to whole farm emissions. This allows the user to measure and monitor the footprint of these, as part of the whole farm picture. Renewables generated and used on-farm are included in this. As renewables have a lower carbon footprint than grid electricity, emissions from farm energy use associated with enterprises will also be reduced. While farm woodlands may currently be considered part of the LULUCF, agroforestry is one way in which trees would be considered part of agriculture, according to the GHG Inventory.

Carbon benchmarks by enterprise

As an illustrative guide to carbon benchmarking within Scottish Agriculture the following benchmarks were extracted from the Agrecalc dataset. The benchmarks provide breakdown of emission sources by enterprise, and average key performance indicators. Additional options are available in the Agrecalc webtool, including comparison with the top 25% performers and benchmarking against previous carbon audits.

Beef Benchmarks	Upland suckler spring calving cows		Lowland suckler spring calving cows	
	EMISSIONS BY SOURCE	kg CO ₂ e/ kg dwt (%)		
Enteric fermentation	24.34	57%	20.97	57%
Manure management	8.49	20%	6.62	18%
Fertiliser	4.75	11%	4.56	12%
Purchased feed	2.09	5%	2.09	6%
Purchased bedding	0.71	2%	0.55	1%
Fuel	1.33	3%	1.16	3%
Electricity	0.03	0%	0.04	0%
Other	1.26	3%	0.98	3%
TOTAL EMISSIONS	<u>42.91</u>		<u>36.89</u>	
KEY PERFORMANCE INDICATORS				
Steer sale weight kg	477.2		530.91	
Mortality %	2.65%		2.35%	
Calving %	92.88%		95.03%	

Sheep benchmarks	Crossbred ewe flock		Good hill ewe flock	
	EMISSIONS BY SOURCE	kg CO ₂ e/ kg dwt (%)		
Enteric fermentation	17.65	59%	20.48	62%
Manure management	5.05	17%	5.75	18%
Fertiliser	3.58	12%	2.62	8%
Purchased feed	1.79	6%	1.94	6%
Purchased bedding	0.12	0%	0.09	0%
Fuel	0.98	3%	0.90	3%
Electricity	0.04	0%	0.05	0%
Other	1.01	3%	1.13	3%
TOTAL EMISSIONS	<u>30.13</u>		<u>32.85</u>	
KEY PERFORMANCE INDICATORS				
Lamb sale weight (kg dwt/head)	19.2		18.3	
Mortality %	6.18%		4.80%	
Lambing percentage (%)	160.26%		138.34%	

Dairy benchmarks	Dairy - all year calving, 8,000l avg. yield	
EMISSIONS BY SOURCE	kg CO₂e/ kg FPC milk	
Enteric fermentation	0.61	44%
Manure management	0.25	18%
Fertiliser	0.16	12%
Purchased feed	0.29	21%
Purchased bedding	0.01	1%
Fuel	0.03	2%
Electricity	0.01	1%
Other	0.02	1%
TOTAL EMISSIONS	1.38	
KEY PERFORMANCE INDICATORS		
Milk production (l/cow)	7845.08	
Mortality %	5.22%	
Calving %	93.25%	

Ruminant systems – key emissions sources

- **Enteric fermentation** – methane emissions are caused by the digestive process of the animal as they break down plant materials in the rumen. This is a normal process, so emissions cannot be eliminated, however there is much ongoing research into the role of diets and additives in reducing enteric emissions.
- **Manure management** – total emissions relate to how much time livestock spend at pasture, on the hill, or housed, whether slurry or bedded systems, and how the manure is stored.
- **Fertiliser** – linked to fertiliser use for pasture, other home-grown forages/feed crops and bedding produced on farm for livestock use.
- **Purchased feed** – this source of emissions is regarded as embedded emissions. Embedded emissions may include fertiliser, fuel use in the production of the feed, as well as transport to the farm.

Top mitigation actions for beef and sheep systems

- Improve livestock performance - linked to genetic selection (breed, EBVs) and management practices e.g., seeking to reduce days to slaughter, reduce age at first calving and reduce carcass weight.
- Increase calves/lambs reared – linked to reducing mortality rates through improved breeding selection, birth management, nutrition, and body condition scoring management.
- Increase homegrown forage use and reduce purchased feeds – linked to adapting management practices to make better quality silage, improve grassland management, growing additional forage

crops and seeking to match feed demand with grass supply (appropriate lambing and calving dates).

- Optimising feeding and nutritional strategy, use of precision feeding to reduce days to slaughter, improve feed conversion efficiency, thereby improving ewe and cow performance.
- Optimising soil nutrient use by carrying out soil sampling, nutrient budgeting incorporating organic manures, manure management, and optimal fertiliser application and timings.

Top mitigation actions for dairy systems

- Improving livestock performance through genetic selection (breed, EBVs) and management practices to reduce calving interval, improve fertility, using sexed semen, and improving milk quality.
- Increasing milk output and quality through optimising nutrition, body condition score management, and improving the health and welfare.
- Increasing homegrown forage use and reducing purchased feeds through producing better quality silage, improving grassland management, reviewing grazing strategies, growing alternative forage crops, and better matching feed demand with grass supply.
- Optimising nutrient use through soil sampling, nutrient budgeting incorporating organic manures, manure management, and optimal fertiliser application and timings.
- Reviewing manure management and storage linked to the use of slurry store covers, acidification and separation, and precision spreading.

Cereal Benchmarks	Malting spring barley		Feed wheat	
EMISSIONS BY SOURCE	kg CO2e/ kg grain (%)			
Manure and fertiliser	0.20	67%	0.22	71%
Pesticides	0.00	0%	0.00	0%
Lime	0.03	10%	0.02	6%
Fuel	0.05	17%	0.05	16%
Electricity	0.00	0%	0.00	0%
Crop residues	0.03	10%	0.03	10%
Other	0.00	0%	0.00	0%
TOTAL EMISSIONS	0.30		0.31	
KEY PERFORMANCE INDICATORS				
Grain yield (t/ha)	6.74		9.09	
Straw yield (t/ha)	2.81		3.19	
Fertiliser use (t per t grain)	0.08		0.07	
Red diesel use (l per t grain)	17.26		15.07	

Top mitigation actions for cereal crops

- Optimising nutrient use using soil sampling, nutrient budgeting incorporating organic manures, manure management, optimal

fertiliser application and timings and optimising fertiliser/manure/biosolids use.

- Exploring alternatives to synthetic nitrogen using grassland and legumes in crop rotation, using more N-efficient crop varieties, choosing lower emission fertilisers, and the use of cover crops for nutrient carry-over.
- Monitoring and improving fuel use – identifying use hotspots and using GPS to reduce fertiliser and fuel use.
- Reducing tillage intensity where appropriate. This is beneficial for fuel as well as seeking to reduce soil compaction and soil carbon, although there are potential trade-offs with crop productivity.
- In areas/seasons where grain drying is necessary, consider energy sources with lower associated emissions, e.g., renewable energy.

Top enterprise emissions sources for cereal crops

- **Manure and fertiliser** – the embedded emissions of fertiliser and manure (imported or 'home-produced') and the process of application and volatilisation.
- **Fuel use** – linked to the field operations of establishing, treating, harvesting, and drying the crop.
- **Crop residues** – these emissions relate to the incorporation of the proportion of the crop not removed at harvest. For example, if straw is incorporated, the crop residue emissions will be higher than if it was removed. Benefits of straw incorporation to soil carbon and subsequent crop yields are not included in the carbon calculation but should be recognised.
- **Lime use** – this may or may not be a component in the carbon footprint, depending on whether the farm is recording actual lime use when it is applied, or the annual liming requirement. When applied correctly, the benefits of liming on productivity and improving emissions per unit of output of crop generally outweigh the emissions associated with using it.

Mitigation actions for other sectors

While the livestock and crop systems selected give an indication of emissions sources for other similar ruminant animal systems, emissions from mono-gastric livestock like pigs and poultry are quite different. Emissions are largely from nitrous oxide and carbon dioxide, reflecting embedded emissions of purchased feeds (including land use change), and energy use for indoor systems.

Top mitigation measures for pigs and poultry usually focus on optimising feeds, nutrition, health, and genetics.

Whole farm emissions mitigation

General whole farm actions can also be taken to reduce or offset emissions across agricultural enterprises. These include:

- **Energy and fuel use:** monitoring energy and fuel use, such as using a smart meter, can assess the efficiency of equipment and activities, and help identify small changes such as switching to more energy efficient lightbulbs or insulating areas of heat loss in water pipes.
- **Renewable energy:** generating renewables on farm, such as wind, solar and hydro-electric power may reduce energy bought in from the grid for use on farm and have lower emissions when doing a carbon audit. According to the National Inventory, emissions mitigation from energy sold to the grid is also considered as 'exported' from the farm. See the Renewable Energy section, page 347, for further information on a wide range of farm renewable activities.
- **Fertiliser and manure management:** preparing a farm nutrient management plan can help to identify opportunities for better utilisation of organic and inorganic fertiliser e.g., applying nitrogen at optimum rates and timings, maintaining, or increasing clover content of swards or other legume crops.
- **Carbon sequestration and offsetting:** various measures can be used to manage soil carbon, including tillage practices, soil erosion control, conserving areas for biodiversity, and managing or increasing woodland areas. For more information on farm woodlands see the Forestry and Farm Woodlands section, page 307.

Soil carbon sequestration

On farms, soil carbon can be increased or decreased depending on the use of the land. All soil has existing (resting) carbon stocks, i.e., a natural level of carbon in the soil, which is determined by climatic factors such as temperature, moisture content, as well as mineral composition and soil texture. Generally, the soil carbon stocks in the UK vary between around 80–120 tonnes carbon per hectare to a depth of 30cm. Changes in the management of the land may affect whether these resting soil carbon stocks are maintained, increased, or depleted.

Agriculture is part of a natural carbon cycle, where carbon in the atmosphere is captured in plants and recycled to the atmosphere through livestock and animal consumption or natural breakdown. Without interference the system is in a carbon balance, with soil carbon stocks being maintained. As this (biogenic) carbon is recycled relatively quickly into the atmosphere, the growth of plant material on its own cannot usually be considered as sequestration.

Agricultural practices affecting this system can alter the amount of carbon 'recycled', resulting in either carbon sequestration or carbon loss, depending on the practice. The principle used by IPCC is that changes in agricultural practice that lead to changes in soil carbon stock levels will, if maintained, take effect over a 20-year period. After year 20 it is assumed that the soils have reached a new equilibrium of soil carbon stocks

(higher or lower) and that no more soil carbon sequestration will then take place from this change in management practice.

Example: As part of the natural cycle, grass and stored carbon is removed by grazing animals, which then return the carbon back into the atmosphere or the soil, either as enteric fermentation or as manure. The portion of the grass not eaten by stock or removed by harvesting machinery, together with the roots, will in time decompose, and the carbon will then be stored in the soil. Therefore, the ability for grassland to sequester carbon in the soil depends on grassland management practices, forage utilisation, stocking density, reseeding practices, as well as land use factors such as the length of time it has been grassland, and the soil type.

In reality, it is accepted that soil carbon changes may not occur evenly over a set time and the length of time this change occurs may vary widely too. However, to make carbon estimates workable at the farm level a simplification of complex soil carbon interactions is considered necessary, as has been adopted by the current IPCC methodology.

Carbon sequestration is not an infinite process – soil will not keep absorbing carbon indefinitely, no matter how you manage it. All soils will have a natural maximum carbon threshold, based on the soil type, characteristics, structure, and management, just as soil organic matter will increase to a point but reach a maximum potential percentage individual to that type of soil. This is described as the soil reaching ‘carbon saturation’.

Carbon markets and credits in agriculture

There is increasing interest and attention on ‘carbon farming’, i.e. the possibility that agriculture could provide a source of carbon credits through management practices, and an additional income stream to farmers through the sale of credits. Investors are moving into this space, offering farmers payments for unqualified carbon credits, and some farmers have begun to sell these assets.

However, unlike woodlands and peatlands, there is not yet a set of standards for agricultural or soil carbon credits, and the market is currently unregulated. Various research and policy projects are ongoing to explore support and systems required for a regulated carbon market in agriculture, which may enable safer engagement in these new markets – see: <https://sustainablesoils.org/soil-carbon-code/about-the-code>. For the time being, the recommendation is not to sell carbon credits until such frameworks are in place.

If you are considering selling carbon credits in the future, here are a few things to check before entering the market:

- **Establish whether you have anything to sell.** Carbon offsets or sequestration may be small relative to total emissions of production. The best way to establish what your farm carbon balance is and whether you might have any carbon assets to sell is to do a carbon audit which includes soil carbon sequestration.
- **Understand the principles of soil carbon sequestration.** Soil carbon stocks are not the same as sequestration, and credits cannot be linked to stocks. Soil carbon can be sequestered or lost, and soils reach a 'saturation point' where limited further sequestration occurs. Only credits linked to sequestration can be sold if you meet the required criteria.
- In most cases **carbon credit payments require additionality**, i.e., proof that the intervention of the landowner is responsible for any changes in soil carbon levels.
- They will also require **proof that carbon capture has occurred**, including a credible measurement of soil carbon levels over an extended period.
- The **market for soil carbon credits is currently unregulated** (unlike the woodland and peatland codes). A soil carbon code is in the process of development, due later this year.
- **Who knows where the carbon price will go?** Sell now and you might be kicking yourself in a few years as prices are likely to increase as pressure grows to reach net zero targets. If you decide to sell, sell only a share of what you can capture in any one year or spread any sales out.

For more information about agricultural and soil carbon codes, see the Carbon & Climate section of the Farm Advisory Service website. For more information on the Woodland Carbon Code, see the Forestry and Farm Woodlands section.

The role of peatland in farm carbon accounting

Farm carbon footprinting aims to estimate emissions occurring solely as a result of agricultural activities. While peatland may be found on a croft, farm, or an estate, most of the carbon sequestered by peatland occurs naturally, whether or not that land is farmed, so shouldn't be included in a farm's carbon footprint. This is consistent with other farm GHG accounting such as nitrous oxide emissions, in that soils produce nitrous oxide emissions naturally, but we only include in a farm's carbon footprint the 'extra' emissions which come as a result of management.

Methodologies to explore the impact of farm management practices on the carbon stock change of peatland are being explored, although it should be noted that this is a double-edged sword; often, farming of peatland reduces or reverses the sequestration process vs. natural peat, which would have to be accounted into farm carbon footprints.

Renewable Energy

Introduction

Fluctuating energy costs, government initiatives, a desire for self-efficiency and reducing your carbon footprint have prompted many farmers to consider renewable energy, as well as assessing where energy efficiency savings can be made. Successful small and medium scale renewable developments will make the best use and get the most value out of renewable generation. Energy savings are now often the driving factor for many farm scale renewable projects. This section introduces some renewable energy technologies that are most relevant to the rural sector: wind, hydro, anaerobic digestion, biomass heating, ground source heat pumps, biodiesel and energy crops. Landowners pursuing renewable energy projects are advised to seek independent advice to verify likely energy yields, costs and technical and economic viability, rather than rely solely on information supplied by equipment manufacturers. Consideration of local planning policy and environmental impact, alongside suitable engineering, construction and design scrutiny should be undertaken for any renewable development.

Energy efficiency

Before considering installing any renewable energy generation technologies it makes sense to review what opportunities there may be to improve energy efficiency. Undertaking an energy audit helps to identify energy uses and highlight potential opportunities to reduce energy bills as well as to improve your business's carbon footprint (see page 331 for more detail on carbon foot printing). The first step in reducing energy use is to measure current usage levels to set a baseline. This can be measured by taking meter readings or by using figures from business trading accounts. Using more regular physical and financial records will provide greater detail and understanding of energy uses. Comparing the level of energy used in subsequent years against the baseline figure will then give an idea of trends in energy consumption. Sources of energy inefficiency can then be identified and addressed, both in terms of technical solutions and management changes.

Increasing power efficiency, managing voltage and making the best use of your existing grid connection are all important steps to consider before investing in renewables. Getting these things right and optimising your existing systems can help save you money and make sure you are investing in the right scale and type of renewable technology or storage options available.

Benchmarking energy use against other similar farms can also highlight where improvements can be made. There can be differences in energy use of 30% or more with comparable businesses. The greatest savings in energy use will come from changes to farming systems and practices, therefore agricultural knowledge is vital to be able to exploit these potential savings.

Renewables options appraisal

Each renewable energy technology has different characteristics, which will influence whether or not it is suited for use on a particular farm. It is vital to carefully consider what your objectives are and what you want from a renewable energy installation at an early stage. The following factors are important to consider before deciding which renewable energy technology option(s) you wish to investigate:

- What is the scale and pattern of your energy demand?
- What energy resources do you have available on your farm?
- How much capital do you have access to for investment?
- What level of risk are you willing to take?

For general information on energy efficiency and renewables see:

- FAS Renewable Energy (www.fas.scot/environment/climate-change/renewable-energy)
- Energy Savings Trust (www.energysavingtrust.org.uk)
- Carbon Trust (www.carbontrust.com)
- Scottish Renewables (www.scottishrenewables.com)
- Renewable Energy Association (www.r-e-a.net)
- Business Energy Scotland (<https://businessenergyscotland.org>)
- Home Energy Scotland (www.homeenergyscotland.org)
- Local Energy Scotland (<https://localenergy.scot>)

Grants, incentives and income options

Incentive schemes for renewable energy projects were the main driver for development during the early days of the technology. As renewable technologies advanced, the lower cost of the technology and the savings from offsetting energy bills, and other payment options, made appropriately designed small and medium scale renewable projects an economically viable option, without incentive payments and government subsidies. Impartial advice is recommended to help explore all the various options available when considering renewable developments.

It is always recommended to keep up to date with the latest policies and government announcements, as future opportunities may arise. For example, during summer 2024 the new UK Government announced an Energy Independence Bill, including the creation of Great British Energy, which will support renewable projects across the UK. Other measures announced include the scaling up of renewables, speeding up planning and grid connection processes for energy generators and more investment on energy efficiency measures.

As the technology has established, less government funding support has been required. Banks and financial companies continue to offer support and favourable loans and funding options for a range of renewable developments and for any developer it is worth exploring these options.

Using renewables to offset your own energy demand, therefore, reduce your energy bills is often the best option, especially during energy price hikes and a fluctuating energy market. If you have a high onsite demand that matches well with renewable generation, then it is worth considering your options to offset these high energy bills.

Power purchase agreements (PPA) and export price tariffs provide additional options for generating revenue. However, there can be conditions such as minimum capacity requirements, and the payments can vary widely, therefore, it is beneficial to shop around to find the best offer.

The Smart Export Guarantee (SEG) enables generators to be paid for electricity exported to the grid. SEG is an obligation set by the government for licensed electricity suppliers to offer a tariff and make payment to small-scale low-carbon generators for electricity exported to the National Grid, if they can meet certain criteria. The SEG rate is determined by the various licensees.

Renting land to renewable developers is another option commonly seen on farms as a way of generating income. The amount of land they need varies depending on requirements, but they usually want areas with a high potential yield, good access to the grid and non-prime and non-peaty land. Rental agreements will vary, therefore it is beneficial to get the best deal and get terms checked by a solicitor, as your land will be tied up for the duration of the contract. The change of land from agriculture to energy can have payment and tax implications, and issues such as land access and decommissioning need to be agreed.

There has been a mix of different support mechanisms over the years for different types and scale of renewable generation, including the Renewable Heat Incentive (RHI), Renewable Obligation Certificates (ROCs), and Contracts for Difference (CfDs). More information on all current and past government schemes can be found at: www.ofgem.gov.uk/environmental-and-social-schemes

Support for biofuels is provided by the Renewable Transport Fuels Obligation (RTFO). The RTFO came into effect on 15 April 2008 and aims to increase the use of renewable fuels in the UK and cut the reliance on imported diesel.

A consultation titled; *Amending the Renewable Transport Fuels Obligation (RTFO) to increase carbon savings on land, air and at sea* was undertaken in 2021. It proposes:

- increasing the main RTFO target to supply renewable fuels from 9.6% to 14.6% by 2032;
- expanding RTFO support to new transport modes such as renewable hydrogen in rail and maritime;
- implementing updated sustainability criteria.

For further information on the RTFO please see:
www.gov.uk/guidance/renewable-transport-fuels-obligation

Batteries and storage

There is ever increasing interest and demand to couple renewable energy projects with battery technology or some other form of storage. This can have the advantage of making better use of your renewable technology, increasing yields and reducing the intermittency issues faced by renewable generation. The advancement of electric vehicles and increasing demand for grid balancing services provide additional opportunities in this area.

Storage technologies that can be appropriately deployed at a farm scale include batteries, heat storage and hydrogen production. The market is continuing to grow, bringing a wider range of options available to farmers. A range of revenue streams can be accessed by storage operators including reduced energy import costs, the ability to trade electricity at more attractive price points and receipt of payments for providing grid balancing services.

It is recommended anyone considering these options explores the full range of storage technologies available and gets independent advice from a reputable source. Careful financial analysis and system design is needed, alongside an assessment of onsite demands and export opportunities to ensure storage options are viable.

Wind power

On-farm wind power has two main scales of operation to consider, with commercial wind farm sites having a focus on exporting power to the grid, while small to medium scale generation is more concerned with offsetting purchased power within the farm business. Even if the power generated is primarily being used on the farm, demand may not always be constant, therefore, it is likely that a proportion of the power produced will have to be sold to the grid at certain times.

For landowners with suitable sites for large-scale wind developments there are several development options available:

- Allow a developer to install the turbine(s) in exchange for an annual payment;
- Install the turbine(s) independently either by self-funding or using bank finance, or any combination of the two;
- Joint venture scheme with developer or neighbour;
- Community project with local buy-in.

Wind turbines

Wind turbines are best located in exposed areas with open fetch especially in the direction of the prevailing wind, away from residencies, though situated as close as possible to a grid connection and with good road access. Farmland is often ideal because the total footprint of a turbine development is relatively small and does not lead to a significant loss of agricultural land.

Larger wind turbines take advantage of the higher wind speeds that exist at greater altitude and so are more efficient and economic, however, they also require a larger capital investment.

When comparing the potential benefits of wind power, it is important to be able to compare like with like, therefore, an understanding of the following terms is key:

Rated power - The maximum power that can be produced when the turbine is operating within its safety limits. It is quoted in kW, which is a measure of the energy produced per second.

Theoretical power production - Rated power x number of hours of production per day x number of days operation per year: $500 \text{ kW} \times 24 \text{ hrs} \times 365 \text{ days} = 4,380,000 \text{ kWh}$.

Capacity factor - Wind is not always blowing at a speed sufficient to spin the turbine and generate power, therefore, the capacity factor refers to the percentage of the total available time that the turbine is actually generating power, e.g. 30%.

Actual power production per year - Theoretical power x capacity factor: $4,380,000 \text{ kWh} \times 30\% = 1,314,000 \text{ kWh}$.

The actual power produced will depend on the average wind speed in the area and other factors such as the height of the turbine, diameter of the rotor and the proximity of any feature that shelters the turbine or creates turbulence such as buildings, trees, walls, and the like.

Hydro power

Small-scale run-of-river hydro schemes can be a viable source of renewable electricity on a suitable site.

The key factors that determine the power produced by a hydro scheme are:

Head - The vertical distance through which the water will fall.

Flow Rate - The quantity of water that will be available for power production.

Developers of hydropower schemes require a water use licence from Scottish Environment Protection Agency (SEPA) who will seek to ensure a balance between the benefits to renewable energy generation and the

adverse impacts on the water environment. Schemes where the fall in the river between the intake and discharge points has a gradient of 1 in 10 or steeper will be more likely to obtain a water use licence.

Civil engineering costs vary greatly from site to site. Development costs for very small schemes are much higher per kW capacity than larger schemes. Small sites where the available head is 3 m or less are unlikely to provide a reasonable return on investment unless existing infrastructure can be utilised to reduce capital cost. Higher head schemes need lower flows and hence smaller and cheaper equipment to generate the same power as low head schemes.

The flow rate will vary during the year, however, for a scheme to be viable there must be sufficient flow to keep the system operating at near its rated power for a large proportion of the time. Some flow must be left in the stream for environmental sustainability and consideration of the needs of migrating fish is important.

An indication of the power production of a scheme can be obtained from the following equation:

Power produced (kW) = 7 x Flow rate (m³/s) x Head (m)

A capacity factor of 50% can be expected where a scheme is sized on the mean flow of the river, therefore, a 10 kW scheme may have an annual output of approximately 43,800 kWh, which is sufficient for about 10 houses.

Further information can be obtained from British Hydropower Association (www.british-hydro.org).

Solar photovoltaics (PV)

The sun's energy has always been used by farmers for growing and drying crops. Solar photovoltaic (PV) panels, which produce electricity from sunlight, have become an increasingly common sight on farms in recent years. Despite the comparatively low solar insolation levels in Scotland when compared to the south of England, solar PV can still be a viable option north of the border.

PV panels can be either roof or ground-mounted. Roof mounted arrays are more efficient in terms of land use because they make use of an existing area of space that is not currently adding value to a farm business. Farms also commonly have large areas of roof available in the form of barns and sheds, although it is important to check that roofs are strong enough to support a system if retrofitting to an existing structure. Another issue is that roofs do not always face in the optimum direction (south) or at the optimum angle (usually around 30-40 degrees) and may be shaded by other structures, and in these cases ground-mounted arrays can be an alternative option.

Ground mounting allows for the ideal positioning of panels, which maximises the efficiency of a scheme. However, it can also mean that land use is diverted away from food production and into energy production and there can be additional planning considerations. Land around the panels can still be used for small-scale livestock. The panels are mounted on a framework at a height that allows animals to graze and forage beneath them without damaging or compromising the operation of the system. Advice on the impacts of installing ground mounted solar panels on area based agricultural subsidy payments should be taken.

Biomass heating

Biomass boilers are a well proven, efficient and reliable technology that has been developed over many years in countries such as Austria and Germany. These boilers are generally technologically advanced and highly efficient. More basic boilers are available, which are less efficient and have very little automation, and consequently come at a significantly lower capital cost.

There are four main types of biomass boiler: woodchip boilers, pellet boilers, log boilers and straw boilers. All four options have pros and cons and care must be taken to ensure the right type of system is selected to match user requirements, including factors such as the degree of automation required, the scale and patterns of heat demand, capital cost and local fuel costs and availability.

A few key facts about different woodfuel options include:

- Woodchip and pellet boilers can be fully automated.
- Log and straw boilers can be an economic option where farms have their own log or straw supply. However, they must be loaded manually, generally on a daily basis as a minimum.
- Woodchip is a lower cost fuel when compared to pellets, however, is bulky and can be difficult to handle.
- Wood pellets are clean, easier to handle, require less space to store and have a higher energy output. They are more expensive than chip and cannot be produced on-farm. However, the capital cost of a pellet boiler is lower than a chip boiler.
- Woodchip boilers and their fuel supply systems have higher capital costs, and for technical reasons they are generally not suited to smaller, domestic applications (e.g. below 50 kW).

Costs for biomass boilers are highly variable depending on the individual system requirements. There may also be significant costs associated with installations such as constructing a fuel store, or purchasing specialist vehicles to use for handling or loading fuel, etc.

In most small-scale situations, it is not practical to produce electrical power from biomass, because such systems are complex and expensive.

For this reason, generating power is only worth considering when there is a large demand for both heat and power.

Farm scale biodiesel

Biodiesel can be made from a wide range of vegetable oils and animal fats (tallow). High quality straight vegetable oil (SVO) can also be used as a fuel at higher inclusion rates in certain engines. The use of biodiesel and SVO above 5% inclusion could impact on engine manufacturer's warranties.

On-farm biodiesel production from rapeseed involves two stages; cleaning and crushing the seed to extract oil, and esterification of the oil by mixing with methanol in the presence of a catalyst to remove glycerol. Although chemically this is a simple process there is a need for careful quality control to achieve the required standards. Handling methanol and the catalyst (usually potassium hydroxide) on the farm is hazardous and requires attention to health and safety and insurance. To produce SVO is the same as for biodiesel without the esterification reaction step. Rapeseed meal is an important co-product of the crushing process and a useful protein supplement for animal feed.

Growers should calculate an 'on the road' price considering the costs of feedstock, capital and operating costs, allowing for income from production of rapeseed meal, and adding the full fuel duty and VAT. Small-scale producers may benefit from a 2,500-litre tax free personal allowance. Production costs for SVO are considerably lower.

Renewable Transport Fuel Obligation (RTFO) Certificates offer the potential for increased returns, however, it may prove difficult for smaller operators to access this income. Biodiesel from waste materials such as tallow receive double RTFC's. Data on carbon and sustainability performance must be independently verified before RTFCs are awarded.

Anaerobic Digestion

Anaerobic digestion (AD) uses bacteria to convert organic matter into methane and carbon dioxide (referred to as "biogas"), in the absence of oxygen. The biogas can be used to provide heat, generate electricity or upgraded to biomethane (carbon dioxide is removed) for injection into the gas grid. In addition, AD can provide other benefits; utilising wastes, reducing emissions of methane, cutting odours and enhancing water quality.

Feedstock can be any biodegradable non woody plant, animal matter (manures/slurry), energy crops (grass, rye or maize silage, beet) and food waste. Food wastes are becoming less attractive due to falling gate fees for accepting them, complex licensing and regulation and higher

capital costs of the plant for pasteurisation. However, sustainability requirements that 50% of biogas must be derived from wastes or residues has the potential to open up new markets for AD, so long as the waste material is responsibly sourced and suitable for AD. It is important that the mix is kept relatively consistent and that the balance of carbon to nitrogen is suitable for the bacteria. Feedstock can comprise conventional grass silage, however, specialised energy crops are likely to perform better overall in an AD plant, as they are not selected for feed quality, just dry matter yield and nitrogen efficiency.

The high degree of automation and control in a modern biogas plant means that on-farm plant costs are high. For any proposed plant, the cost and availability of feed stock will be the main factors determining viability. If you do not have enough of your own land available to produce sufficient feedstock, securing long term contracts for off-farm feedstocks will be essential. A thorough feasibility study is also recommended to assess the viability of any project being considered.

For larger scale AD plants, whether gas-to-grid or Combined Heat and Power, farmers are mainly involved as feedstock suppliers. The capital costs of gas-injection plants are higher due to the need to “scrub” the gas to meet grid standards (remove carbon dioxide). The location of these plants is also usually dependent on local gas grid capacity. Where feasible, gas to grid AD plants have a clear economic advantage, and this is reflected in the increasing number of new plants following this approach. For farmers supplying feedstock the principles are the same though there may be greater seasonality of pricing in gas to grid plant reflecting payment structures for wholesale gas (higher prices in the winter).

Farmers growing crops for AD feedstock will find that prices vary from plant to plant and will reflect the basis of the sale; standing crop or delivered plant. Prices will also reflect shared costs such as specialist machinery and the value assigned to digestate.

The relative profitability of AD and cereal crops will change from year to year and that is why AD crops are best included as part of range of crops and market outlets. AD plant operators are unique in offering relatively long contracts of 5 to 10 years for feedstock crops. Therefore, the best approach for most farmers is likely to be to include AD crops as part of mixed cropping system. This will deliver some security of income from long term AD contracts alongside flexibility to benefit from any rise in grain prices that may occur.

AD crops may also offer other potential benefits to the farm business including; spreading the workload, providing early entry for oilseed rape and enabling grass to be brought back profitably to all-arable rotations.

Farmers growing AD feedstock must now meet key sustainability standards to receive support. Ofgem require all RHI claimants to

demonstrate their feedstocks meet sustainability criteria regarding land use change (rarely relevant in UK) and carbon emissions. For the RHI the carbon intensity of the feedstock must be less than 34.8g CO₂ equivalent per MJ of energy produced, however, for new biomethane plants operating within the Green Gas Support Scheme the threshold is reduced to 24g CO₂ equivalent per MJ energy. In crop production the main source of greenhouse gases is inorganic nitrogen fertiliser, so usage needs to be minimised. In AD systems this is partly achieved by the application of digestate back to the crop. With careful planning it is likely that most crops grown for AD will be able to meet these carbon targets. Ofgem provide an online calculator and guidance though it is advised that expert advice is also sought when preparing this information especially for the first time. See www.ofgem.gov.uk for full details.

Crop Costs for Anaerobic Digestion

PHYSICAL DATA

(a) Yield and harvest

Yields are based on crops grown in southern and central Scotland assuming average weather conditions and SRUC's experience from recent trials. Actual yields will vary widely and are much less certain in the north with maize not recommended outwith southwest Scotland. Trial results indicate that rye yields are more consistent year to year than beet, reflecting the crop's longer growing period. Harvest of winter hybrid rye is typically around the middle to end of July with maize and energy beet harvests in late October.

(b) Seed

Certified seed has been assumed for all crops and hybrid seed for rye and maize.

(c) Fertiliser

Full rates of artificial fertiliser have been calculated to match crop offtake. Where digestate from an Anaerobic Digestion (AD) plant is applied fertiliser rates should be adjusted accordingly. In practice digestate use is likely to reduce but not entirely replace the requirement for artificial fertiliser due to mismatches in nutrient availability and timing between crops.

(d) Sprays

Full rates based on current best practice have been assumed.

(e) Contract

These include the cost of specialist contractors for harvesting and transporting the roots or silage produced to a nearby (within 3 miles) AD plant. Transport costs should be adjusted accordingly to the distances involved.

(f) Output prices

The price in the market for AD feedstock will be determined by local feedstock supply and demand issues and the conditions of the contract. The contract price will reflect the basis of the sale; standing crop, ex-farm or delivered to plant. It will also reflect the method agreed to share other costs such as specialist machinery and the value and costs assigned to any digestate applied to the land (see previous pages).

Crop Costs for Anaerobic Digestion

COST OF PRODUCTION DATA - LOCAL DELIVERED BASIS

	Energy beet	Hybrid rye	Grass silage	Maize
Yield: fresh (t/ha)	67.5	42.0	36.0	38.0
Dry matter (%)	22%	34%	29%	30%
Yield : dry matter (t/ha)	14.85	14.28	10.44	11.40
Methane yield (m ³ /fresh t)	99	108	95	106
Energy (MWhr TH/fresh t)	1.2	1.3	1.1	1.3
Energy (MWhr TH/ha)	79.7	54.1	40.9	48.0
	£/ha			
COSTS				
Seeds	202	162	28	196
Fertiliser	230	328	381	275
Sprays	224	37	10	91
Contract cultivation	346	277	66	305
Contract harvesting	388	178	434	173
TOTAL COSTS (£/ha)	1,390	982	919	1,040
TOTAL COSTS (£/t)	21	23	26	27
TOTAL COSTS (£/MWhr TH)	17	18	22	22

Note: Contract costs include fuel. The above cost of production data exclude charges such as land rental, interest, management time and any margin requirements which will be important to include when considering any contract price agreement.

Biomass Crops for Energy

Willow short rotation coppice

Willow is a perennial biomass crop grown principally for energy production on a 15 to 20 year rotation with harvesting every 3 to 4 years once established. Returns from the crop are highly dependent on yield and woodchip price. The main market for the woodchip is on contract to power generators and large-scale thermal plants. The woodchip is not suitable for small-scale biomass heating schemes without significant grading and drying costs due to the high bark and moisture content and oversized chips. Given the limited markets, high costs of establishment, variable growth rates and lack of planting grants the crop is largely uneconomic.

Short rotation forestry

This is a variation on conventional forestry based on early harvesting of fast-growing species through coppicing and regrowth. In general, the most economic age to harvest conventional timber species is at maturity so the case for shorter rotations in most species remains unproven. A number of tree species capable of coppicing can be used for short rotation forestry (SRF), e.g. Alder, Notofagus, Poplar, Eucalyptus and Sycamore. Large-scale trials with several species and sites are currently being carried out by the Forestry Commission. As with conventional forestry, a wide range of sites will be suitable for cultivation of these species, including sites which have a lower nutrient status and a poorer land classification.

Trees are grown to butt size 15-20 cm for harvest at 8-20 years. Current advice is to plant at 2m square and apply broad spectrum herbicide to control weeds during establishment. Nitrogen application in the first year should be avoided as there is no benefit to growth. SRF has not been examined on a sufficiently extensive scale or period to derive crop data as yet. Yields will vary from site to site, with average annual increments estimated at between 4 to 9 m³/ha/yr or around 1.5 to 3.2 ODT/yr. Planting grants may be available as part of the forestry grant schemes being offered under Rural Development across the UK. See the Scottish Forestry (<https://forestry.gov.scot/>) for updates on the energy forestry trials work underway.

Miscanthus

Miscanthus is a perennial energy crop suited to the southern half of the UK with viability dependent on yields, contract prices and proximity to biomass power stations or other market outlets. The crop has also found a higher value outlet as poultry and horse bedding due to its high level of moisture absorbency and low dust levels. The miscanthus chips are also less favoured than woodchips for fuel due to low bulk density and high chlorine content. As a result, growing the crop for bedding is becoming the preferred end use in many areas. The crop uses a C4 photosynthetic pathway, like maize, requiring high light intensities and temperatures.

Yields at suitable sites south of a line from the Severn to the Wash are expected to be 12-15 ODT/ha. Low ground sites north of this may also be feasible but as with maize, yields and viability are likely to be reduced.

The crop is established using rhizomes, typically at 15,000 plants/ha. Like willow coppice, planting requires specialist equipment and relatively costly planting material resulting in high establishment costs. After the first year the crop can be harvested annually and has a useful life of 15-20 years. Weed control is necessary in the establishment year and possibly in the first spring. Nutrient demand is low with typically an application of 40N:40P:40K kg/ha in year one. Most crops are unlikely to require further applications although up to 150 kg/ha N may be applied over the first 2 years in some situations. The need for pest and disease control is low.

Reed canary grass

Reed canary grass is a perennial plant well suited to cultivation in northern and western parts of the UK and commonly grown in Scandinavia for fodder and increasingly for AD. In the UK the plant is widely used as a game cover crop. It grows well under marginal conditions, including upland areas and brownfield sites in northern and western areas. It is a perennial crop established from seed (unlike *Miscanthus*) leading to considerable cost advantages.

Establishment and cultivation are undertaken with existing farm equipment with the need for some nitrogen fertiliser to achieve maximum yield. Trial yields vary from 5 to 14 ODT/ha with the crop performing better at more northern sites where average yields of over 10 ODT/ha have been achieved. Further work is needed to determine viability, but it has cost saving and land use flexibility advantages compared to other perennial crops and can utilise more marginal land. The crop also has useful flexibility in its end use; in the summer it can be cut for AD production or grazed by cattle; in the winter and spring it can be baled for biomass fuel or animal bedding.

Fuel

Introduction

This section provides information on fuel prices, calorific values, relative costs accounting for efficiency of conversion, costs and regulations for liquid fuel storage.

The last few years have seen fluctuating fuel prices and insecurity in global energy markets. This, together with tackling environmental concerns and improving energy efficiency have put the focus on assessing the best fuel and energy options for the farm. Households, business, and agricultural enterprises are all feeling the ramifications from these variations and fluctuating costs in their energy bills. Energy prices are currently very volatile due to multiple factors, therefore, this section should be used as a rough guide only and farmers should closely monitor trends and changes in prices throughout the year. When comparing different fuels, it is essential to include any losses from conversion to heat as different fuels and technologies differ significantly.

Fuel Prices

The figures provided below represent an average of the prices in summer 2024. These should be used as a guide only and should be supported by actual quotes that take into consideration site specific information. In most cases fuel prices change daily and the price will depend on many factors including the volume purchased, location, length of contract and supply profile.

Energy prices can vary widely across the country, however, higher prices have led to an increase in the amount of fuel poverty in Scotland (defined as any household spending more than 10% of their income on energy). Help with energy bills and advice can be found at:
<https://www.mygov.scot/help-energy-bills>.

Electricity

Electricity prices have reduced over the last year, but remain high and future fluctuations are likely. Electricity prices will vary depending on what part of the country you are in and your type of supply. Given the volatility of energy markets and the current problems they face, it is prudent to shop around for the best deal and to keep abreast of advice from experts, comparison websites and any future government policy interventions. However, ensure that you do not get caught out negatively by exit fees. Also due to the unprecedented increase in wholesale energy costs it may not be the best option to swap suppliers at this time. Standing charges vary widely. For large supplies they are less relevant, however, for small supplies the standing charge will be a much greater proportion of the annual cost.

Gas

Tariff type (piped gas)	unit p/kWh	daily charge	average p/kWh
Credit (domestic)	6.23	38.76	7.17
Debit (domestic)	5.39	29.63	6.12
Pre-pay (domestic)	5.16	31.55	5.92

As discussed previously, gas prices and the energy market are incredibly volatile. These figures should be used as a rough guide only and will vary after time of publishing. We recommend you shop around for the best deal and keep up to date with the latest advice and any potential future developments. Estimates on business tariffs are more complex and difficult to find on comparison sites, therefore suppliers should be contacted directly for current rates.

Propane

	Price
Propane (bulk, not in a long term contract)	59.06 p/litre
Propane (47 kg cylinders)	£88.16 per cylinder
Butane (12 kg cylinders)	£43.16 per cylinder

Diesel oil

	p/litre
Gas oil (red diesel), 35 sec, tractor	69.40
Kerosene, 28 sec, Aga Cookers, etc	70.31
Derv (white diesel)	147.20

Coal

	£/t
House coal (100 x 10kg bags)	497.00

Biomass Fuels

	Price
Firewood - seasoned hardwood logs (delivered)	£201.80/m ³
Firewood - seasoned softwood logs (delivered)	£169.20/m ³
Woodchips (G30, 30% moisture)	£190.00/t
Wood pellets (5 t blown, including delivery)	£310.00/t
Wood pellets (100 x 10kg bags, including delivery)	£400.86/t

Straw

	£/t
Large round bales (ex farm)	70.00

Calorific Values of Fuels

These values are only approximate and may vary quite considerably:

Electricity	3.60 MJ/kWh
Gas	3.60 MJ/kWh
Propane/Butane	50.00 MJ/kg; 25.50 MJ/litre
Gas oil	42.50 MJ/kg; 35.70 MJ/litre
Kerosene	43.50 MJ/kg; 36.64 MJ/litre
Coal	31.40 MJ/kg
Firewood (20% moisture content)	14.71 MJ/kg
Woodchips (30% moisture content)	12.50 MJ/kg
Wood pellets	16.85 MJ/kg
Straw (20% moisture content)	13.80 MJ/kg

Note: 1 tonne liquefied propane gas = 1,957 litres (approx.)

1 m³ of loose seasoned hardwood timber = 0.35 tonnes (approx.)

1 m³ of loose seasoned softwood timber = 0.25 tonnes (approx.)

Fuel Cost Values

The fuel cost values have been corrected for efficiencies. (*Relative cost)

	p/MJ *	Efficiency (%)	p/MJ	p/kWh
Electricity	6.36	100	6.36	22.90
Gas	1.70	80	2.12	7.64
Propane (bulk)	2.32	80	2.90	10.42
Propane (47 kg)	3.76	80	4.70	16.91
Butane (12 kg)	7.21	80	9.01	32.43
Gas oil	1.94	70	2.78	10.00
Kerosene	1.92	70	2.74	9.87
Coal (open fire)	1.58	25	6.33	22.79
Firewood (efficient log boiler) ¹	4.60	80	5.75	20.70
Firewood (basic log boiler) ²	3.92	60	6.53	23.52
Woodchips ³	0.96	80	1.20	4.32
Wood pellets (blown)	1.84	85	2.16	7.79
Wood pellets (bagged)	2.38	85	2.80	10.08
Straw (cereal)	0.51	60	0.85	3.04

¹ burning softwood 20% moisture content

² burning hardwood 20% moisture content

³ 30% moisture content

Fuel Storage

Safe storage for fuel on farms, rural businesses and dwellings should be a high priority. Regulation for the storage of fuel is covered by The Water Environment (Miscellaneous) (Scotland) Regulations 2017 and The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended). These regulations are applicable for farms, although there are exclusions. One of the main requirements for new and existing above-ground tanks where there is a storage capacity of 200 litres or more, is the provision of a secondary containment system (bund) of sufficient capacity to contain at least 110% of the largest tank or 25% of the total storage capacity.

For further detail on the regulations, guidance should be sought from your local SEPA office or see:

<https://www.sepa.org.uk/regulations/water/pollution-control/oil-storage-in-scotland/> or refer to NetRegs: <https://www.netregs.org.uk/environmental-topics/materials-fuels-and-equipment/oil-and-fuel-storage>.

Fuel storage tanks come in various types, shapes, and sizes. When choosing your fuel tank, siting should be taken into consideration. Guide prices for storage tanks are shown below and prices will vary depending on manufacturer and specification.

Plastic tanks	Capacity (litres)				
	1200	1500	2000	2500	5000
Single skin	£559	£655	£855	£989	-
Bunded	£1,150	£1,406	£1,695	£1,825	£2,869
Dispensing (bunded)	-	£1,717	-	£2,139	£4,045
Underground	£4,110 (1400 litres)			£4,795 (2500 litres)	

All tank prices are ex VAT and do not include delivery, design or installation charges.

Labour and Machinery

Introduction

The largest component of fixed costs on farm is labour and machinery. This is also the most variable between farms. For this reason, it is essential to fully understand and manage both labour and machinery costs as they can have a large bearing on the financial viability of the farm business. This section details the key elements including standard labour requirements by enterprise, machinery operating data such as rates of work per hour, methods to calculate the cost of owned machinery, detailed contractors' charges for a wide range of farm operations and regulations for on-road use. The final section details essential information on labour costs, regulation and health and safety requirements.

Standard Labour Requirements

Enterprise CROPS (per hectare)	Hours/ annum	Enterprise LIVESTOCK (per animal)	Hours/ annum
Cereals	18	Dairy cows	
Oilseeds	16	50 cows	42
Hops	60	100 cows	35
Sugar beet	33	150+ cows	28
Field beans and peas	16	Beef cows	26
Potatoes		Other cattle	12
early	200	Sheep	
main crop	110	ewes and rams (lowland)	5.2
Fodder crops	6	ewes and rams (LFA)	3.7
Miscanthus	16	other sheep (lowland)	2.9
Outdoor vegetables/salad	280	other sheep (LFA)	3.1
Other peas and beans	500	Pigs and poultry	
Vining peas	12	sows	28
Top and soft fruit	425	finishing and rearing pigs	2.3
Hardy nursery stock	1,900	piglets (<20 kg)	0.2
Fruit/vegetables under cover	7,000	broilers	0.09
Flowers/plants under cover	13,000	laying hens	0.36
Mushrooms	7,220	growing pullets	0.24
Fallow	2.9	other poultry	0.10
Grassland	3.1	Goats	12
Silage (made by farm)		Deer	15
1 st cut	12	Horses*	40
2 nd cut	10		
Rough grazing	1.5		

Note: There are difficulties in standardising labour requirements and these figures represent 'typical' labour requirements under representative

conditions for enterprises of average size and performance. They are not necessarily reflective of economic viability. If calculating farm labour demand, note that crop coefficients should be reduced proportionately for operations carried out by contractors. Livestock coefficients should be reduced pro rata if an animal is not on farm for a full year.

These figures relate to those published in a report of the UK Farm Classification Document (October 2014) and which recommends that 1900 hours of labour are equivalent to one standard annual labour unit. To reflect smaller field sizes, the standard labour requirements for field enterprises should be increased by 50% for Northern Ireland.

Source: <https://www.gov.scot/publications/agriculture-rural-and-fisheries-statistics-standard-output-coefficients/>

* Detailed figures for horses can be found in the following publication: The Equine Business Guide, ABC, 8th Edition.

Machinery Operating Data

Rates of work

The following figures are typical rates of work for conditions in northern UK. Actual rates of work can vary widely from these figures depending on the organisation of the system. Methods of calculating rates of work are shown later.

For 'standalone' operations such as ploughing and cultivating, factors such as soil type and conditions, field size and shape, topography, operator experience and size of tractor will affect the overall work rate.

Rates of work for planting, drilling, spraying and fertilising operations will depend on application rates and external field factors such as ease and speed of refilling and location of materials (e.g. water, fertiliser, seed potatoes).

For other operations, which require a system approach, such as grain, silage and potato harvesting, additional factors such as crop yields, labour and transport availability can have a marked effect on work rate.

	Typical rate of work (ha/8 h day)
Ploughing (reversible plough):	
4 furrows	6.9
6 furrows	10.4
Cultivating:	
heavy disc, 3 m, 100 mm deep	13.4
light tine, 3.5 m, 100 mm deep	15.7
harrows, 4.5 m	20.2
combination cultivator (for seedbed preparation), 3 m	13.6

	Typical rate of work (ha/8 h day)	
power harrow, 3 m, 150 mm deep		10.0
roller, 2.4 m, heavy		12.3
roller, 7.3 m, light		46.7
potatoes, bedforming, 1.83 m bed		6.0
potatoes, stone windrowing basic, 2 row (Reekie)		4.5
Fertilising:		
twin disc, 1,000 kg capacity		24.0
lime spreader, 2 machines and 1 loader		32.0
slurry, 6,000 litre size, 0.8 km haul		29.6
Grain drilling: establishment (following ploughing)		
3 m grain only drill		16.2
3 m grain/fertiliser drill		13.0
3 m combination power harrow/grain only drill		12.6
4 m combination power harrow/grain/fertiliser drill		15.0
4 m trailed machine/grain/fertiliser drill		32.5
Grass: seed sowing - drill 3.7 m wide		10.4
Roots: precision sowing, 2 row		2.4
Potatoes: planting, 2 row, cupped design (narrow spacing)		6.0
Potatoes: planting, 6 row, belt design (wide spacing)		15.0
	<i>Application rate</i>	
	<i>200 litres/ha</i>	<i>100 litres/ha</i>
Spraying:		
tractor mounted, 850 litre tank, 12 m boom, no bowser	33.6	40.0
tractor mounted, 800 litre tank + 600 litre on front, 18 m boom	52.0	64.0
tractor mounted, 800 litre tank + 600 litre on front, 18 m boom, with bowser	60.8	72.0
sprung LGP vehicle, 800 litres, 12 m boom, with bowser	68.0	87.2
self-propelled, 2,500 litres, 24 m boom, with bowser	144.0	176.0
Grain:		
combine harvesting, drum width 1.05 m, typical cutter bar width 3-3.7 m		14.3
combine harvesting, drum width 1.30 m, typical cutter bar width 6.6 m		26.9
combine harvesting, drum width 1.6 m, typical cutter bar width 7.7 m		31.4
combine harvesting, drum width 1.7 m, typical cutter bar width 9.12-11.97 m		42.8

Typical rate of work (ha/8 h day)	
Potatoes:	
haulm pulverising: 1.8 m, 2 row	6.5
harvesting: two row trailed, elevator discharge	3.5
Turnip harvesting	1.6
Silage making:	
(i) 5 men, 75 kW + precision chop harvester, 3 trailers, buckrake	
800 m haul:	9.0
1,500 m haul:	7.4
(ii) 6 men, 90 kW + precision chop harvester, 3 trailers, buckrake	
800 m haul:	16.0
1,500 m haul:	10.0
(iii) 6 men, self propelled harvester, 4 trailers, buckrake (will usually involve a rake operator at some point to 'group' the smaller mower bouts into a single larger bout)	40.8
(iv) 2 men, forage wagon, buckrake (depending on distance to pit)	15.0-20.0
Grass:	
mowing, disc, 2.4 m width of cut	15.4
mowing, disc, 3.0 m width of cut	19.2
mowing, disc, 9.0 m width of cut	46.1
baling hay, conventional baler	6.4
baling straw, conventional baler	9.6
baling straw, round baler	16.0

Days available for field work

(e.g. ploughing, cultivating, drilling, root harvesting)

Calculated for Bush Estate, Midlothian, altitude 200 m.

Month	Field work days for three soil types and two month probability levels					
	Light soil		Medium soil		Heavy soil	
	50%	75%	50%	75%	50%	75%
January	25	24	22	18	20	12
February	25	23	21	17	19	12
March	25	24	21	18	20	15
April	27	25	22	19	24	17
May	28	26	25	22	26	20
June	28	26	27	24	27	24
July	29	27	28	26	28	26
August	28	26	27	25	27	24
September	27	25	25	23	24	20
October	26	23	23	19	22	17
November	26	22	23	18	23	17
December	26	23	22	18	23	14

Probability levels of 75% (18 years out of 24) and 50% (12 years out of 24) are shown in the table so that different risk levels can be compared. The 75% probability level is recommended for machinery and labour planning.

If machinery and labour are adequate for 18 years out of 24, other facilities such as contractors, overtime and casual labour can be used during the remaining years. Alternatively, the operation can be performed in wetter conditions.

Soils data used for the calculation of these figures are based on three drainage categories:

Light soils	Freely drained sandy loam	e.g. Darvel series
Medium soils	Moderately drained loamy clay	e.g. Macmerry series
Heavy soils	Imperfectly drained clay loam	e.g. Winton series

Workday figures in the table are based on the daily fluctuations of soil moisture content, predicted from daily values of rainfall, sunshine hours and mean air temperature. A day is assumed to be a work day if the soil moisture content at 9 am is below the lower plastic limit and the total rainfall during the same day does not exceed 10 mm.

Meteorological data spanning 24 years has been used.

The following example uses the figures in the previous table to help calculate the work rate of a tractor.

Example: A tractor has to be purchased to plough 120 ha of heavy soil between mid-August and mid-September. What work rate will be required?

From the preceding table, at 75% probability, the number of days available on a heavy soil during the months of August and September are 24 and 20 respectively.

- Therefore, days available second half of August = $24/2 = 12$
 - Therefore, days available first half of September = $20/2 = 10$
-
- 22

Assuming an eight-hour working day, the total time available is 176 hr. In order to complete the work within the desired period the tractor should be capable of ploughing at least 0.68 ha/hr (calculated by dividing 120 ha by 176 hr).

Alternatively, if the lower probability of 50% is chosen for the same soil and area the tractor work rate would be calculated as:

- Days available second half of August = $27/2 = 13.5$
 - Days available first half of September = $24/2 = 12.0$
-
- 25.5

Assuming an eight-hour working day, the total time available is 204 hr. In order to complete the work within the desired period the tractor should be capable of ploughing at least 0.58 ha/hr (calculated by dividing 120 ha by 204 hr).

Typical field efficiencies

Field efficiency is a measure, as a percentage, of a machine's field capacity after taking into account for failures to utilise the full operating capacity. These failures result from items such as overlapping, turning and other routine time delays associated with the operation. Typical figures, shown in the following table, are expressed as a percentage.

Ploughing	90%	Grain only drilling	75%
Power harrow + grain only drill	60%	Combining	85%

Calculating workrate

$$\text{Workrate (ha/hr)} = \frac{\text{working width (m)} \times \text{forward speed (km/hr)} \times \text{field efficiency (\%)}}{10}$$

For example, a 9.1m combine travelling an average of 6km/hr has a work rate of 4.64 ha/hr as per the calculation below:

$$\text{Workrate (ha/hr)} = \frac{9.1 \text{ (m)} \times 6 \text{ (km/hr)} \times 85 \text{ (\%)}}{10} = 4.64 \text{ ha/hr}$$

Estimating Machinery Costs

Machinery costs on many farms can be a major contributor to high levels of fixed costs. Part of the reason for this is that often farmers do not have a clear idea of what their machinery is costing them. Consequently, to improve machinery management the first step is to establish current machinery costs.

To compare the cost of doing the job in-house against the rates charged by a local contractor, the actual machinery costs must be costed. This is a straightforward task for an operation like combining where one machine is involved. But for more complex operations, such as sowing or silage harvesting, the task is more difficult as only part of the tractor's duties are attributable to the operation. In such cases a wider assessment of the farm's annual machinery usage must also be undertaken.

Example calculation - cost estimate for purchasing and operating a combine harvester

To illustrate the principle behind estimating machinery costs this example has been shown on page 378, showing the purchase of a combine harvester for £325,000 versus using contractors.

This method is based on estimating the annual fixed and operating costs of the machine given expected annual use and machine life. These

estimates can then be used in a partial budget for comparison with alternative policies such as the use of a contractor.

The following three tables provide the supporting information for the steps in the machinery calculation.

Table 1: Depreciation - average annual fall in value

Frequency of renewal (years)	Complex (high depreciation rate) ¹	Established (many moving parts) ²	Simple (few moving parts) ³
1	34.0%	26.0%	19.0%
2	24.5%	19.5%	14.5%
3	20.0%	16.5%	12.5%
4	17.5%	14.5%	11.5%
5	15.0%	13.0%	10.5%
6	13.5%	12.0%	9.5%
7	12.0%	11.0%	9.0%
8	11.0%	10.0%	8.5%
9	10.0%	9.5%	8.0%
10	9.5%	8.5%	7.5%

Typical frequency of renewal with heavy use
 Typical frequency of renewal average use
 Typical frequency of renewal with light use

- ¹ e.g. Potato Harvesters, Pea Viner
- ² e.g. Tractors, Combines, Balers, Forage Harvesters
- ³ e.g. Ploughs, Trailers

Table 2: Fuel consumption

Fuel is a significant cost for farming and rural businesses. Actual fuel consumption will vary depending on variables such as the power and size of machine used, depth of operation, correct calibration, appropriate maintenance of machinery, speed and care of operation. The table below gives an indication of the fuel cost of some farming operations based on red diesel costs of £0.69/l (Jul 2024).

	Fuel consumption (l/hour)	Time taken for operation (hours/ha)	Diesel usage (l/ha)	Diesel cost (£/ha)
Subsoiling	18.9	1.11	21.00	14.57
Ploughing (6 furrow)	26.8	1.11	29.75	20.65
Heavy Cultivation	26.8	0.71	19.13	13.27
Light Cultivation	8.6	0.47	4.02	2.79
Power harrow	26.8	1.00	26.78	18.58
Fertiliser spreading	8.6	0.18	1.57	1.09
Grain drilling 3m	18.9	0.53	9.95	6.90

	Fuel consumption (l/hour)	Time taken for operation (hours/ha)	Diesel usage (l/ha)	Diesel cost (£/ha)
Rolling 7.3m light	8.6	0.33	2.88	2.00
Potato Planting 2 row	10.8	1.33	14.40	9.99
Mowing 3m	18.4	0.49	9.01	6.25
Baling straw, round bales	26.8	0.50	13.39	9.29
Forage harvesting	61.2	0.40	24.48	16.99
Spraying 24m	10.8	0.18	1.96	1.36
Towing (trailer)	16.2	0.40	6.48	4.50
Combine harvesting 7.7m	37.8	0.31	11.63	8.07
Potato harvesting 2 row	21.6	2.29	49.37	34.26

Table 3: Estimated annual cost of spares and repairs (as a percentage of purchase price at various levels of use)

	Approximate Annual Use (Hours)				
	500	750	1000	1500	+ each additional 100
Tractors	5.0%	6.7%	8.0%	10.5%	5.0%

	Approximate Annual Use (Hours)				
	50	100	150	200	+ each additional 100
Harvesting machinery					
Combine harvesters, balers, potato harvesters	1.5%	2.5%	3.5%	4.5%	2.0%
Other implements					
Ploughs, cultivators, toothed harrows, hoes	4.5%	8.0%	11.0%	14.0%	6.0%
Rotary cultivators, mowers, pea cutter windrowers	4.0%	7.0%	9.5%	12.0%	5.0%
Disc harrows, fertiliser spreaders, FYM spreaders, combine drills, potato planters (with fertiliser), sprayers, hedge cutters	3.0%	5.5%	7.5%	9.5%	4.0%
Swath turners, tedders, side delivery rakes, unit drills, forage harvesters, semi-automatic potato planters	2.5%	4.5%	6.5%	8.5%	4.0%

	Approximate Annual Use (Hours)				
	50	100	150	200	+ each additional 100
Corn drills, milking machines, hydraulic loaders	2.0%	4.0%	5.5%	7.0%	3.0%
Grain driers, grain cleaners, rolls, hammer mills	1.5%	2.0%	2.5%	3.0%	0.5%

Example calculation - Purchase of combine harvester versus using contractors

Cost element	Value	ref	Factor	Calculation
Area harvested (ha)	600	A	-	-
Work rate (ha/hr)	2.75	B	-	-
Annual hours worked (hr)	218	C	-	A / B
Machine life (yr)	9	D	-	-
Purchase price (£)	325,000	E	-	-
F'cast 5yr selling price (£)	39,000	F	12%	E*depreciation% (table 1)
Average value (£)	182,000	G	-	(E+F) / 2
Depreciation (£)	31,778	H	-	(E-F) / D
Interest (£)	9,100	I	5%	G*interest rate (%)
Insurance (£)	2,730	J	£15	G*£ per £1k
Annual fixed costs (£)	<u>43,608</u>	K	-	H+I+J
Fuel use (l/ha)	12	L	-	(table 2)
Fuel cost (£)	4,997	M	£0.69	A*L*fuel price (£/l)
Spares and repairs (£)	14,625	N	4.5%	E*% (table 3)
Labour (£)	2,727	O	£12.50	labour (£/hr)*(A/B)
Annual operation costs (£)	<u>22,349</u>	P	-	M+N+O
Annual cost (£)	<u>65,957</u>	Q	-	K+P
Annual cost (£/ha)	110	R	-	Q / A
Contractor charge (£/ha)	116			(incl. fuel)

Based on these assumptions, owning a combine is cheaper (£110/ha) than average contractor's charges (£116/ha) but other factors must be considered:

- If the farmer increases the area harvested the overall cost of the combine increases to reflect higher fuel, repairs and depreciation costs. But this increase is spread over a much larger area and consequently reduces cost per ha.

- Work rate has a major effect on machinery cost. Many factors influence work rate efficiency, some of which are beyond the control of the farmer, while others can be improved upon.
- Contractor's charges are also highly variable depending on the above and other factors such as the level of local competition amongst contractors which can greatly affect charges.

For more information on payment terms involved in purchasing machinery see credit options on pages 511-513.

Machinery Contractors' Charges

Prices are indicative market rates taken from various contractors and machinery rings throughout Scotland with the costs of the driver (generally) included. Fuel is not normally included in contract charges. However, as prices and contractors arrangements (e.g. farm fuel used) vary considerably within areas, the prices listed below only serve as a guide and local information should be sourced for specific operations.

Costs of carrying out specific operations, i.e. arable stubble to stubble and preserved forage are illustrated on pages 44, 72-73 and 86.

	Average price	Price range
Arable cultivation		
Ploughing	£73.22 /ha	£61.78-£81.54
with press	£8.75 /ha	£7.41-£9.88
Discing	£47.79 /ha	£42.01-£61.43
Power harrow	£65.24 /ha	£56.83-£74.13
Min till cultivations	£67.21 /ha	£54.36-£78.08
Cambridge roller	£15.94 /ha	£12.36-£23.01
with paddles	£8.03 /ha	£6.18-£9.88
Subsoiling	£74.81 /ha	£66.72-£80.31
Topping - fallow	£31.26 /ha	£22.24-£38.18
Rotovating	£85.32 /ha	£74.13-£94.71
Grassland maintenance		
Heavy flat roller	£27.96 /ha	£24.71-£34.45
Topping - grass	£37.31 /ha	£29.65-£47.94
Chain harrowing	£34.82 /ha	£33.80-£35.83
Spring tine harrowing	£37.72 /ha	£29.65-£45.79
Aeration	£32.12 /ha	-
Sward lifting	£65.57 /ha	£50.83-£80.31
Sowing		
Grass seed - broadcast	£35.55 /ha	£34.03-£37.07
Grass seed - with harrows	£37.44 /ha	£22.86-£51.89
Grass seed - direct drilling	£64.68 /ha	£54.36-£86.49
Grain (no fert.)	£41.75 /ha	£32.12-£51.37

	Average price	Price range
Oilseed rape (no fert.)	£69.50 /ha	£54.36-£86.49
Turnips	£90.19 /ha	£76.60-£103.78
Beet	£77.53 /ha	£66.10-£88.96
One pass cultivation/drill (cereals, no fert.)	£74.54 /ha	£61.78-£84.01
One pass cultivation/drill (OSR, no fert.)	£74.65 /ha	£64.86-£81.54
with fertiliser	£7.41 /ha	£7.41
Maize (without plastic)	£80.64 /ha	£57.50-£103.78
Maize (with plastic)	£163.09 /ha	-
Fertiliser spreading		
Spinner	£12.33 /ha	£9.88-£15.96
with variable rate	£3.34 /ha	£1.85-£4.45
Liquid fertiliser (surface)	£18.40 /ha	£15.79-£21.00
Irrigating (/25mm)	£234.75 /ha	-
Manure and lime		
Rotary - medium	£38.93 /hr	£30.00-£49.50
Rear discharge - medium	£45.33 /hr	£36.00-£51.00
Rear discharge - large	£53.73 /hr	£42.00-£67.05
Slurry - medium	£50.61 /hr	£42.00-£70.42
Slurry - large	£55.98 /hr	£42.00-£74.92
Lime	£7.25 /t	£6.00-£8.00
with gps	£0.50 /t	-
Umbilical		
- Dribble Bar	£119.00 /hr	£101.00-£137.00
with additional pumps	£72.50 /hr	-
Spraying		
Spraying	£15.32 /ha	£12.36-£18.53
with gps	£3.71 /ha	-
Slug pellet application	£8.44 /ha	£8.65-£11.19
Weed wiping	£55.00/hr	-
Combinable harvesting		
Cereals	£108.54 /ha	£91.43-£116.93
with yield mapping	£4.94 /ha	-
with chopper	£10.32 /ha	£7.41-£12.26
Oilseed rape - direct	£100.90 /ha	£84.01-£120.46
Oilseed rape swathing	£54.32 /ha	£50.66-£57.99
Peas and beans	£109.09 /ha	-
Crimping/bruising grain/pulses	£12.39 /t	£8.60-£14.50
Straw chopping	£53.13 /ha	£51.89-£54.36
Forage		
Mower	£32.65 /ha	£29.65-£36.18
Mower and conditioner	£38.34 /ha	£36.45-£43.24

	Average price	Price range
Tedding/raking	£19.18 /ha	£14.21-£23.47
Precision chop - self-propelled	£76.64 /ha	£66.72-£83.25
Cutting, raking, chopping and carting	£194.43/ha	£191.18-£197.68
Forage box	£131.60 /hr	£131.20-£132.00
Forage harvester (whole crop)	£126.50 /ha	£103.78-£140.85
with processor	£14.83 /ha	-
Maize (including forager, 3 trailers and buckrake)	£206.00 /ha	-
Baling and wrapping		
Silage/hay - 4x4	£3.50 /bale	£2.95-£4.06
with chopper	£0.53 /bale	£0.40-£0.60
Silage – 5x4x2.3	£5.20 /bale	£4.40-£6.00
Hay - small square	£0.74 /bale	£0.60-£1.25
Straw - 4x4	£3.12 /bale	£2.60-£4.06
Straw - 4x5	£3.64 /bale	£3.00-£4.69
Straw - 8x4x2.3	£5.34 /bale	£5.00-£5.84
Straw - 8x4x4	£8.22 /bale	£7.90-£8.50
Straw - small square	£0.83 /bale	£0.65-£0.95
Wrapping - round	£2.25 /bale	£1.85-£3.14
incl. wrap (4 layers)	£5.23 /bale	£4.00-£6.17
incl. wrap (6 layers)	£6.62 /bale	£6.25-£7.12
Wrapping - square	£3.49 /bale	-
incl. wrap (4 layers)	£5.76 /bale	£4.90-£6.62
Wrapping - tube-line, silage	£3.38 /bale	£3.15-£3.50
Wrapping - tube-line, straw	£3.37 /bale	£3.15-£3.50
Stacking	£0.45 /bale	£0.30-£0.60
Ag bagging	£7.50 /t	-
Baling and wrapping incl. wrap (4 layers)	£8.34/bale	£8.00-£8.50
Root and potato work		
Deep plough	£89.64 /ha	£76.60-£111.20
Deep ridge	£68.26/ha	£49.42-£85.25
Bed tilling	£132.82 /ha	£129.73-£135.91
Destoning	£284.60 /ha	£259.46-£315.05
Bed forming	£127.87 /ha	-
Potato planting - without fertiliser	£142.45 /ha	£86.49-£242.36
Potato planting - with fertiliser	£151.10 /ha	£93.90-£248.56
Potato pulverising	£58.07 /ha	£43.24-£69.19
Potato harvesting - excl. pickers	£550.29 /ha	£444.78-£700.01
Turnip harvesting	£48.50 /hr	-
Tractor hire - including driver		
4 WD up to 100 hp	£35.00 /hr	£30.00-£40.00
4 WD 101 - 150 hp	£38.67 /hr	£33.00-£50.33
4 WD 151 - 220 hp	£43.89 /hr	£37.00-£57.80

	Average price	Price range
4 WD 220 - 300 hp	£55.92 /hr	£39.00-£69.79
4 WD over 300 hp	£75.28 /hr	£42.00-£92.25
Tracked	£65.88 /hr	£65.75-£66.00
with loader	£4.00 /hr	-
with trailer	£7.28 /hr	-
4 WD telehandler	£41.25 /hr	£33.00-£54.89
JCB type excavator	£36.17 /hr	£34.00-£37.50
Tracked excavator 15-25t	£44.79 /hr	£42.00-£50.00
with rock pecker	£16.50 /hr	£13.00-£20.00
Skidsteer	£77.00 /day	-
Tractor with post chapper (+ man)	£43.75 /hr	£32.50-£55.00
Labour		
Casual	£15.93 /hr	£15.30-£16.50
Experienced/skilled ¹ (weekdays)	£18.05 /hr	£17.25-£19.94
Cereal/potato roguing	£18.75 /hr	£17.50-£20.00
Secretarial	£23.00 /hr	-
Miscellaneous		
Strimming	£24.00 /hr	-
Hedge cutter	£50.70 /hr	£40.00-£71.80
Log splitter	£40.00 /hr	-
Snow plough	£55.75 /hr	£35.00-£67.26
Road brush	£35.50 /hr	£30.00-£41.00
Haulage - forage (hay and straw) ²	£32.00 /t	-
Haulage - concentrates ²	£32.00 /t	-

¹ includes skilled relief milkers, stockmen, shepherds, sprayer operators and forklift/digger/HGV drivers.

² for small flocks/herds a minimum fee of £100-150.

³ haulage charges are highly dependent on distance travelled, weight of load and options for a back load.

Grain Drying

All costs for drying include a price for handling and loading.

Grain

Reduction to 15% moisture content from:

16%	17%	18%	19%	20%	21%	22%	23%
£7.90/t	£9.80/t	£11.70/t	£16.00/t	£18.50/t	£21.00/t	£23.50/t	£26.00/t

Contractor's weight loss (including drying and cleaning):

From	16%	17%	18%	19%	20%	21%	22%	23%
Weight loss	4%	6.3%	7.2%	8.2%	9.2%	10.2%	11%	13%

See page 45 for equivalent grain weights at varying moisture contents.

Oilseed rape

Reduction to 8% moisture content from:

10%	11%	12%	13%	14%	15%	16%	17%
£9.80/t	£11.70/t	£13.60/t	£16.10t	£18.60t	£21.00t	£24.90/t	£28.70/t

Contractor's weight loss (including drying and cleaning):

From	10.5%	11.5%	12.5%	14.5%	16.5%	18.5%	20.5%	22.5%
Weight loss	3%	4.5%	6%	9%	12%	15%	18%	21%

Drainage

Drainage costs and work rates will vary considerably depending on specific site circumstances (current drainage system and terrain) and requirements. All drainage work should be fully discussed, inspected, designed and quoted (materials and labour split) prior to work commencing to prevent discrepancies at a later date.

Draining

Operation	Price
3t mini-digger + man + diesel	£25.00-£30.00/hr
7 ½ ton JCB + man + diesel	£32.00-£37.00/hr
15 ton tracked digger + man + diesel	£35.00-£50.00/hr
Typical work rate (32" depth)	20 - 40m/hr
Trencher (+ man + diesel + handling gravel + pipe)	£2.75-£10.50/m
Typical work rate	150 - 200m/hr
Trenchless (+ man + diesel + handling gravel + pipe)	£2.50-£9.75/m
Typical work rate	150 - 200m/hr
Tractor + gravel cart (incl. man + diesel)	£30.00-45.00/hr or
	£1.75-£2.75/ton handling charge

Approximate draining costs on an area basis are shown below:

Lateral spacing	Method	Materials	Price £/ha
7m	Digger	no gravel	6,406
15m	Digger	purchased gravel	6,466
15m	Digger	own gravel	4,036
15m	Digger	twinwall plastic pipe & own gravel	6,063
15m	Trenchless	purchased gravel	4,227
20m	Digger	purchased gravel	4,849
20m	Trenchless	purchased gravel	3,208

Materials

Material		Price
Gravel		£20.00-£26.00/ton
Corrugated plastic pipe	60mm (150m coil)	£116.00(or £0.77/m)
	80mm (100m coil)	£110.00(or £1.10/m)
	100mm (100m coil)	£150.00(or £1.48/m)
	160mm (35m coil)	£156.00(or £3.12/m)
Twinwall plastic pipe (6m lengths incl. coupling)	100mm	£14.82 (or £1.60/m)
	150mm	£26.86 (or £3.26/m)
	225mm	£61.60 (or £6.93/m)

Pipe requirements

Lateral spacing	m/ha	m/acre
7m	1,430	575
15m	670	270
20m	500	200

Gravel requirements (tonnes per 1 metre run)

Width of trench	Depth of gravel (mm)				
	250	300	450	600	900
100mm	0.05	0.06	0.09	0.12	0.18
125mm	0.06	0.08	0.11	0.15	0.23
150mm	0.08	0.09	0.14	0.18	0.27
225mm	0.11	0.14	0.20	0.27	0.41
300mm	0.15	0.18	0.27	0.36	0.54
450mm	0.23	0.27	0.41	0.54	0.81
600mm	0.30	0.36	0.54	0.72	1.08
750mm	0.38	0.45	0.68	0.90	1.35

Secondary drainage treatments

Operation	£/hr	£/acre
Subsoiling	65.00-115.00	54.00-80.00
Moling	65.00-115.00	50.00-100.00
Flat lifter	75.00-120.00	50.00-70.00
Aerator	23.00-84.00	25.00-35.00

Drain jetting

	Price
Drain jetter with tractor	£40.00-£60.00/hr
Drain jetter with tractor (incl. digger + tractor + bowser)	£700-£800/day

Ditch cleaning

	<i>Price</i>
Ditch cleaning (20-125m/hr)	£1.75 - £2.25/m or £38.00-£48.00/hr

Fencing

The costs in the following table will vary considerably depending on fence purpose, fence length, site difficulty (such as access, ground conditions, presence of rock, and number of turns) and, type and quality of materials.

Net fences	£/m
Mild steel netting, 2 mild steel plain wires, 1 mild steel barb wire assuming stobs every 2m, a strainer at either end, a turning post every 50m and 8 gripples every 200m	5.02
High tensile netting, 3 high tensile plain wires, 1 barb wire assuming stobs every 3m, a strainer at either end, a turning post every 50m and 8 gripples every 200m	4.55
High tensile steel netting, 2 high tensile plain wires, 1 high tensile barb wire assuming steepleless steel posts every 4.5m, a steepleless steel strainer with stay kit at either end, a steepleless steel turning post every 50m and 8 gripples every 200m	6.16
Plain wire fence	£/m
8 high tensile plain wire, 1 barb wire assuming stobs every 2m, a strainer at either end and a turning post every 50m	4.47
Scare fence	£/m
2 barb wire assuming stobs every 5m, a strainer at either end and a turning post every 50m	2.39
Electric fences (energisers not included)	£/m
High tensile netting, 4 high tensile plain wires assuming stobs every 3m, a strainer at either end, a turning post every 50m and 8 gripples every 200m	4.78
Electric fences (energisers not included)	£/m
8 high tensile plain wires assuming stobs every 2m, a strainer at either end and a turning post every 50m	4.84
2 high tensile plain wires, assuming stobs every 5m, a strainer at either end and a turning post every 50m	2.53
Deer fence	£/m
Deer netting, rabbit netting, 3 mild steel plain wires assuming stobs every 3m, a strainer at either end and a turning post every 50m	8.50

Post and rail fence	£/m
5 rails assuming stobs every 2m, a strainer at either end	12.37

Hedges	£/m
Hedge laying	15.00

There are regional and contractor variances on fence types. It is important to ensure the materials are chosen with purpose in mind, e.g. net fencing for sheep can differ from that suitable for cattle so as to help prevent loss of sheep ear tags. All fencing work should be fully discussed, inspected and quoted (materials and labour split) prior to work commencing to prevent discrepancies at a later date.

Labour costs for fencing will vary between £10.00-16.50/hr. Chapping costs are £25.00-38.00/hr and for strainers, £15/post. Dismantling existing fencing, site preparation and fence disposal are added charges.

Dry Stone Walling

Excluding provision of material	£25-50 /m ²
Stone	£60-100 /t

Regional and contractual variations will apply in terms of the price of dry stone walling, in part depending on ease of access to site, availability of stone and nature and size of the wall. In general terms the price quoted for labour will be based on a metre square rate and will include the building of both sides of the wall, where a free-standing structure is required. Prices will vary for retaining walls. It is good practice to discuss and inspect the work with the dry stone waller beforehand, which will help identify whether additional stone is required. As a rough guideline, 1t of stone will be required for every linear metre of a free-standing wall approximately 1.3m high. Specialist stones, such as throughbands, quoins or copes may need to be sourced separately.

The Dry Stone Walling Association (www.dswa.org.uk) has a list of current professional members available on its website.

Agricultural Vehicles on the Road

Below are some key points that should be adhered to when agricultural vehicles are to be used on the public road. Vehicles must be used for 'agricultural purposes' before it can be licenced as an agricultural vehicle.

Drivers licence – Usually a full car licence will include the 'F' category which is the tractor section. For some vehicles (combines etc) category 'B' will also be required. Vehicles fitted with tracks depending on the steering arrangement may require the 'H' category on the drivers licence.

Farm ATV's can be registered as light agricultural vehicles and driven on the road provided they have the full road legal kit.

Drivers ages – After passing the 'tractor' test a 16 year old can drive an agricultural vehicle on the road provided it is mounted on wheels, is no wider than 2.45m and is not pulling a trailer exceeding a single or double axle close coupled design which is also below 2.45m wide. Once over 17 years old they can then operate most agricultural machines apart from tracked machines which is over 21 years of age. You must sit a separate test, category H, for tracked vehicles. Drivers aged 17-20 will be restricted to a Maximum Authorised Mass (MAM) of no more than 3,500kg. Anyone wishing to tow a trailer behind a car, van or 4x4 and has passed their driving test after the 1st January 1997 is only required to sit a separate B + E trailer test where the MAM exceeds 3,500kg.

Speed limits – The majority of agricultural tractors may travel at 25mph. Some tractors are built to higher specifications and are permitted to travel at up to 40mph. The higher speed limit applies to tractors that have (among other requirements) all-wheel suspension, braking efficiency of 50%, pneumatic tyres, a speedometer and a horn. The exact requirements are contained in the Construction and Use Regulations 1986 (as amended). Wider tractors (falling into the special type agricultural vehicle category) have lower speed limits as follows:

- Vehicles 2.55m - 3.5m wide are limited to 20 mph.
- Vehicles 3.5m - 4.3m wide are limited to 12 mph.

For more information, see:

<https://www.gov.uk/government/publications/tractors-regulations-on-use/tractors-and-regulatory-requirements-a-brief-guide-september-2017>

Trailer brakes – If a vehicle is travelling up to 25mph then hydraulic brakes are sufficient. Over 25mph then progressive brakes should be fitted along with ABS and a failsafe system.

Vehicle weights – Depending on axle spread the maximum authorised mass (MAM) should not exceed 31,000kg (tractor and implements attached). The trailer on its own again depending on axle load limits should not exceed 18,290kg. The additional axle load on the rear axle of the tractor imposed from the trailer should not exceed 3,000kg.

Vehicle widths – Up to 3m wide no notification is required. 3.0m - 3.5m, the police have to be notified, max speed 20mph. 3.5m - 4.3m, notification to police, attendant vehicle and lights fitted in reduced visibility, max speed 12mph. Over 4.3m, notification to secretary of state, attendant vehicle and lights fitted in reduced visibility. In all cases any projections must be marked and lights fitted when required.

Pick up hook rings – Ensure the gap between the top of the hook and the upper part of the hitch does not exceed 10mm gap when locked. The minimum thickness of the trailer ring should be no less than 30mm.

Tyre condition – Up to 20mph the tyres have to be in a safe condition and roadworthy. Over 20mph and there can be no cuts exceeding 25mm in length, have a minimum of 1mm tread depth and no obvious damage or wear and tear.

Lights – All lights when fitted must be visible, working and correctly positioned. Amber beacons are only required on unrestricted dual carriageways unless used as a warning for wide vehicle etc. No rear facing white lights are allowed.

Registration plates – Plates fitted to towing vehicles must match the vehicle and the registered keeper of the vehicle.

Fuel – Red diesel is permitted only if the vehicle is registered as an agricultural vehicle and being used for an agricultural related purpose. The rules changed as at 1st April 2022 and can be found at <https://www.gov.uk/guidance/using-rebated-fuels-in-vehicles-and-machines-excise-notice-75-from-1-april-2022>.

MOT testing – Most agricultural vehicles will be MOT test exempt but must still meet the construction and use regulations when on the public road.

Labour Legislation and Policy

National hourly wage rates – excluding agricultural workers

The mandatory National Living Wage (NLW) applies to workers aged 21 and above, whilst the National Minimum Wage (NMW) applies to apprentices and those under 21. The following table shows the NLW and the NMW hourly rates for age categories.

Age	NMW and NLW hourly rates (£/hr)		
	2024	2023	2022
21 +	11.44	10.42	9.50
18-20	8.60	7.49	6.83
16-17	6.40	5.28	4.81
Apprentice *	6.40	5.28	4.81

* Applies if they are under 19 or if older then only when they are in the first year of apprenticeship, thereafter minimum wage or National Living Wage for their age applies.

Some employers are part of a voluntary scheme to pay an enhanced 'Real Living Wage', currently £12.00 per hour, payable from 18 years old.

Minimum hourly wage rates for agriculture

Scotland

The following table summarises the rate of pay figures as set in the Agricultural Wages (Scotland) Order (No.71) with effect from 1 April 2024.

Agricultural minimum hourly wage (£/hr) - Scotland	
Minimum hourly rate of pay for all ages of workers ¹	11.44
Minimum hourly rate of pay for workers who undertake an SCQF Level 4 or 5 or equivalent ²	7.17
Additional sum for workers with qualifications ³	1.71
Overtime ⁴	From: 17.16
Dogs (£/dog/week - up to a max. of 4 dogs)	9.36

- 1 Hourly rate applies to workers whether full time, part time, students etc. and no matter what type of work is done.
- 2 Minimum hourly rate of pay for SCQF or equivalent, is payable to apprentices under 19 for 18 months or to those over 19 in the first year of apprenticeship after which the minimum hourly rate of pay as set for the year will apply.
- 3 For workers with a relevant qualification at SCQF6 or above (includes SVQ/NVQ Level 3, NC. HNC. HND), or those with a Certificate of Acquired Experience obtained before 31 December 1997.
- 4 Based on the minimum hourly rate of pay to which the worker is entitled multiplied by 1.5 - e.g. £11.44 x 1.5 = £17.16.

England

Agricultural workers in England must be paid at least the NMW (see page 388). Where an employment contract dated before 1 October 2013 exists and mentions the Agricultural Wages (England and Wales) Order 2012 the employee still has the right to be paid the agricultural minimum wage for the graded pay rate that is stated in their contract. The agricultural minimum hourly wage rate for those above compulsory school age is £6.21 (Grade 1) after which the rates rise to £9.40 (Grade 6) in accordance with a graded scale relating to specific job definitions and qualifications.

Wales

Agricultural workers in Wales are paid according to the Agricultural Wages (Wales) Order 2024, with a variable rate depending on specific job definitions and qualifications. This order came into force on 1 April 2024. The full scale of hourly rates can be accessed by following the link at the bottom of the section.

Northern Ireland

In Northern Ireland from 1st April 2024 the minimum agricultural hourly pay rate, applicable for the first 40 weeks cumulative employment, is £7.99 (Grade 1) to £13.23 (Grade 6) in accordance with a graded scale relating to specific job definitions and qualifications. Where at any time the National Minimum Wage (NMW) or National Living Wage (NLW) becomes higher than the agricultural hourly rate set out above, then the minimum rate shall be equal to the NMW or the NLW.

Estimated annual labour costs

The following example calculates the estimated annual labour costs to an employer based in Scotland. The earnings of the worker, based on the same assumptions, are also shown.

Assumptions:

- Employee in employment for over 26 weeks
- 39 hr/wk, 5 days/wk, 52 wk/yr less 30 days holidays
- No qualifications top up so minimum hourly rate - £11.44
- 10 hr/wk overtime
- Employers National Insurance Contributions (NIC) @ 13.80%
- Employers liability insurance @ 1%
- Overtime rate - £17.16
- £12,570 personal allowance
- Annual minimum wage amount and annual overtime amount below includes pay for 6 weeks holiday as if overtime is as regular as weekly then employees should be paid overtime as part of their holiday pay.

Labour cost to employer	Annual	Weekly	Hourly
Minimum wage for employee	£23,200.32	£446.16	£11.44
Employers NIC	£3,201.64	£61.57	£1.58
Employers liability insurance	£232.00	£4.46	£0.11
	£26,633.97	£512.19	£13.13
Overtime	£8,923.20		£17.16
Employers NIC	£1,231.40		£2.37
Employers liability insurance	£89.23		£0.17
	£10,243.83	£197.00	£19.70
Total labour cost incl. overtime	£36,877.80	£709.19	£14.47

Employees earnings	Annual	Weekly	Hourly
<i>Workers earnings (gross)</i>	£32,123.52	£617.76	£12.61
<i>Less tax</i>	£3,908.65	£75.17	£1.53
Workers earnings (after tax)	£28,214.87	£542.59	£11.07

For more information on National Insurance Contributions and Income Tax, see pages 517 and 535.

Pensions

Employers have a legal obligation to automatically enrol eligible employees into a workplace pension scheme and pay employers contributions. Depending on the circumstances of businesses, your auto-enrolment duties will begin on either the staging date given to you by the Pensions Regulator or the date that you first hire an employee. Those aged between 22 and state pension age and earn at least £10,000/year must be automatically enrolled. Employers are also required to pay contributions for these employees which is a minimum of 3% of their earnings. If employees are aged between 16-21 or state pension age -74

and earn over £10,000/year or are aged between 16-74 and earn between £6,240 up to £10,000/year, they can request to be added to the workplace pension. If they do, employers must pay contributions. However, if workers are aged between 16 and 74 and earn less than £6,240/year then they do need to be enrolled if they ask but employers don't need to make any contributions.

Redundancy

An employee having worked for an employer for 2 years or more will normally be entitled to Statutory Redundancy Pay. The following table lays out the basis of calculating a redundancy pay amount:

Employee Age	No. weeks pay for each full year worked
under 22 years old	0.5
22-41 years old	1.0
over 41 years old	1.5

An upper limit on weekly pay is set at £700 per week for redundancy pays on or after 6 April 2024. The maximum statutory redundancy pay that can be received is £21,000. Different rates apply prior to 6 April 2024.

Length of service is capped at 20 years with only the last 20 years of employment taken into account. Only complete years are counted.

There is no upper age limit for an employee receiving redundancy pay.

For example, a 50-year-old having worked for their employer for 25 years earning £650/week is made redundant on 7 April 2024. The employee would be entitled to 24.5 weeks pay (11 years @ 1.0 plus 9 years @ 1.5). This equates to a redundancy pay of £15,925.

Higher levels of redundancy pay can be agreed between employees and employers. Redundancy pay less than £30,000 is tax free.

You are not entitled to redundancy pay if your employer offers you suitable alternative work either within the organisation or in an associated company that you refuse without good reason.

Different upper limits on weekly pay apply in Northern Ireland.

Maternity/paternity

Maternity leave arrangements will differ according to specific job arrangements. Statutory maternity pay applies to those who have been working continuously for 26 weeks with the same employer before their 'qualifying week' and if average earnings are at least £123 for the 8 weeks prior to the 'qualifying week'. The qualifying week is 15 weeks before the week that the baby is due to be born. Statutory leave, applies from the day you start a job and, is 52 weeks with the first 26 weeks as ordinary leave and the last 26 weeks as additional leave. You do not have to take 52 weeks but must take 2 weeks following the birth of the

baby. The earliest time to start leave is 11 weeks before the expected birth of the baby.

Maternity pay is paid up to 39 weeks with 90% of average weekly earnings (before tax) for the first 6 weeks and £184.03 or 90% of average weekly earnings (whichever is lower) for the next 33 weeks.

For paternity leave, the entitlement is either one or two weeks and employers must be notified of this leave request no less than 15 weeks before the baby is due to be born. This leave must be taken in one go, not odd days. You do not need to give an exact date for when your leave will start but can instead say the day after the birth or one week from the day of birth. Paternity pay is £184.03 or 90% of average weekly earnings (whichever is lower).

It is now possible to have Shared Parental Leave (SPL) and Statutory Shared Parental Pay (ShPP). You can share up to 50 weeks of leave and up to 37 weeks of pay between you.

Labour arrangements

When employing staff the following should be considered at the outset of employment:

- Holidays and holiday pay.
- Sick pay.
- Maternity and paternity arrangements and pay.
- Pension provision.
- Provision of appropriate PPE (personal protective equipment).
- Dog allowance (where necessary).
- Other benefits, e.g., accommodation, vehicles, bonuses, subsistence.
- Dismissal.
- Redundancy.

The options for labour on farm include casual/irregular workers, self-employed contractors, or hiring permanent staff/employees.

Self-employed contractors are generally hired to carry out a specific task, i.e. harvest work, shearing, fencing, rather than being available at all times to carry out general farm work. Contracting rates are summarised on pages 379-382. HMRC are looking carefully at self-employed contractors and considering where they should more properly be considered an **employee**. There can be serious financial consequences for the employer if a contractor is later deemed to be an employee, particularly if the correct tax has not been paid. Factors taken into consideration include the number of different businesses the contractor works for, whether they provide their own equipment, whether they can send someone else in their place, and the extent to which they can refuse work.

More formal arrangements with contractors exist that would see all or most of the physical farm labour being carried out by the contractor. In

this case the contractor would also, in most circumstances, provide machinery and additional labour requirement. The farmer/landowner would provide the land, capital and fixed infrastructure. These arrangements include contract farming and share farming. The agreements can be devised to suit each circumstance specifically, but the main theme is that the farmer/landowner retains an active interest in the business both from a management point of view and financially. For more details, see pages 434-439.

Other labour opportunities would involve hiring employees on a full-time or part-time basis and the following aspects should be considered as part of the decision-making process:

- Job requirements.
- Qualifications required/training provision.
- Provision of a house and vehicle.
- Payment terms (see minimum hourly wage rates on page 388-394).
- Employment contracts.
- Performance related employment incentives.
- Legality of a person being hired.
- Employment insurance.
- Health and safety.
- Registration with HM Revenue and Customs (HMRC).

Sources of information

Full and specific details of agricultural wage arrangements and conditions across the UK can be found at the following websites:

- UK Non- Agricultural: <https://www.gov.uk/national-minimum-wage-rates>
- Scottish Government (Agricultural):
- [Agricultural wages - a guide for workers and employers: twenty seventh edition - gov.scot \(www.gov.scot\)](http://www.gov.scot)
- England (Agricultural): <https://www.gov.uk/agricultural-workers-rights/pay-and-overtime>
- Wales (Agricultural): <https://gov.wales/agricultural-wages-minimum-rates-pay>
- Northern Ireland (Agriculture): <https://www.daera-ni.gov.uk/articles/awb-agricultural-rates-pay-orders-and-reports>

Further information on labour suppliers, training, pensions, redundancy, and other statutory obligations can be found at the following websites:

- Different types of worker classifications for pension auto enrolment – <https://www.thepensionsregulator.gov.uk/en/document-library/automatic-enrolment-detailed-guidance/1-employer-duties-and-defining-the-workforce#409e28577ec34705a664d2556ed412f3>
- Gangmasters Licensing Authority (GLA): <http://www.gla.gov.uk/>
- LANTRA: <http://www.lantra.co.uk/>
- Department for Work and Pensions (DWP): www.dwp.gov.uk

- HM Revenue and Customs:
<https://www.gov.uk/government/organisations/hm-revenue-customs>
- Advisory, Conciliation and Arbitration Service (ACAS) :
<https://www.acas.org.uk/advice>

Health and Safety

Health and safety should be regarded as an essential part of farm business management. Along with the construction industry, agriculture has the worst safety record of any sector. The Health and Safety Executive (HSE) is responsible for ensuring compliance with legislation and also provides a source of advice and guidance for businesses (see www.hse.gov.uk).

The Health and Safety at Work Act 1974 and the Management of Health and Safety at Work Regulations (MHSW) 2003 place duties on businesses and individuals to ensure that adequate provision is made for health and safety at work. Employers must ensure, so far as is reasonably practicable, the health, safety and welfare of employees and any others who may be affected by what they do.

Every business should have a health and safety policy. The policy should identify the aims for the employees' health and safety and outline the various responsibilities, systems and communication to ensure that health and safety objectives are fully met. This should be in writing if five or more people are employed. Guidance on this is available from the HSE (<https://www.hse.gov.uk/simple-health-safety/policy/index.htm>).

The MHSW Regulations place duties on employers and the self-employed to make a suitable and sufficient assessment of the risk to their own health and safety and that of others from the work they do. This includes employees, any casual workers, part-timers, trainees, customers or contractors. It will also include those who may be affected by work activities, e.g. neighbours, sales people and members of the public. The assessment can be conducted by the business itself, or can be contracted out to a specialist. The people carrying out the risk assessments must be competent, it is not essential to hold a qualification in health and safety. The HSE provide useful guidance on conducting a 5-step risk assessment, titled: '*Managing risks and risk assessment at work*' (www.hse.gov.uk/simple-health-safety/risk/index.htm). The 5 steps are:

1. Identify the hazards.
2. Decide who might be harmed and how.
3. Evaluate the risks and decide on precautions.
4. Record your findings and implement them.
5. Review the risk assessment and update if necessary.

There must be a clear chain of command on who is responsible for each area of work and equipment to maintain health and safety within the business. The final responsibility generally lies with the business owner.

It is good practice to produce a written risk assessment and it is a statutory requirement if five or more people are employed by the business. The risk assessments must be communicated to staff and all relevant people.

A further assessment should be made for Control of Substances Hazardous to Health (COSHH). This is similar to a risk assessment but considers the risks from substances such as dust, gases, fumes, pesticides and zoonoses.

If an accident or near miss occurs it should be reported to the HSE in accordance with the Reporting of Injuries Diseases & Dangerous Occurrences Regulations (RIDDOR).

When carrying out risk assessments for an agricultural related business be aware that one of the biggest causes of death in agriculture is falls from height. Given that most workers spend probably less than 1% of their time working at height this represents the most dangerous part of the job. Every business should examine what tasks are being carried out at height and try to eliminate these or find safer methods.

Many deaths and injuries are caused by transport and machinery. One of the most important pieces of relevant legislation is the Provision and Use of Work Equipment Regulations 1998 (PUWER) which states that:

- All equipment must be fit for purpose.
- All equipment must be properly maintained.
- All equipment must be properly commissioned.
- Equipment must be inspected after difficult conditions.
- Operators and maintenance mechanic must be sufficiently trained.
- Guards over all dangerous parts.
- Safety features all working.
- Lighting sufficient to operate machinery.

All staff have a legal obligation to co-operate with their employers and follow safe procedures.

Particular care should be taken to ensure the safety of children on farms, and the minimum ages for operating or travelling in certain vehicles and machines must be observed.

There are many other pieces of relevant legislation relating to health and safety at work that agricultural businesses should comply with. In some instances training and certification is required.

A useful source of information for farmers is the HSE publication "Farmwise" (<http://www.hse.gov.uk/pubns/books/hsg270.htm>) which provides practical advice and guidance on health and safety.

Land and Buildings

Introduction

This section gives detail on the main legislative, technical and finances related to land and buildings.

Land tenure remains a topical subject as implementation of the Land Reform Act (2016) continues. The detail that follows gives brief descriptions. Specialist legal advice should be sought for specific tenure related circumstances.

Building spaces guidance and costs are laid out to allow users to budget space requirements and capital requirements for existing and new buildings.

Property operating costs for different types of farms can be found in the Whole Farm Data section on page 445.

Land Tenure

There are four types of agricultural tenancy currently available for use in Scotland, although this will change with the ongoing implementation of the Land Reform (Scotland) Act 2016.

To establish what law applies to any agricultural tenancy, it is necessary to determine which type of tenancy is involved. There are currently three core pieces of legislation which govern agricultural tenancies in Scotland. These are:

- Agricultural Holdings (Scotland) Act 1991: '1991 Act' tenancies (secure heritable tenancies)
- Agricultural Holdings (Scotland) Act 2003: Grazing or mowing leases, Short Limited Duration Tenancies (SLDT) and Limited Duration Tenancies (LDT)
- Land Reform (Scotland) Act 2016: Modern Limited Duration Tenancies (MLDT) and Repairing Tenancies

Agricultural Holdings (Scotland) Act 1991

All agricultural tenancies entered into prior to 27th November 2003 are 1991 Act Tenancies.

Tenancies granted under this act give security of tenure to the tenant for unlimited successive generations (i.e. a secure tenancy). The act sets out how rents should be calculated; how improvements should be compensated; how fixed equipment should be maintained and how disputes should be settled.

In order to circumvent the security of tenure granted by a full 1991 Act Tenancy, "Limited Partnerships" were developed.

A 1991 Act Tenancy (with all the legislation that governs this type of tenancy applying) was created but granted not to an individual but rather

a partnership comprising the landowner or 'Limited Partner', and farmer 'General Partner'. If the landowner dissolves the partnership, then the tenant technically no longer exists and by this means the tenancy is ended. These partnerships were normally agreed to last for a defined period (often 15-20 years) and thereafter on a year-to-year basis (tacit relocation). Once the initial term has run its course the tenancy can be ended by the landowner withdrawing from the partnership. This can be done by serving notice on the General Partner.

Agricultural Holdings (Scotland) Act 2003

The 2003 Act came into force on 27 November 2003.

Grazing or mowing tenancies (grass lets)

These are agricultural tenancies where the land is let for grazing or mowing only and for a specific period of the year not exceeding 364 days.

When a Grazing or Mowing Tenancy has ended, the land may only be let again for the same purpose to the same tenant provided one clear day has elapsed between tenancies.

If, with the landowner's agreement (actual or assumed), the tenant continues to occupy the land after the tenancy period has ended, the tenancy is automatically converted to a Short Limited Duration Tenancy (SLDT).

Short Limited Duration Tenancies (SLDT)

These are agricultural tenancies where the letting is for not more than 5 years. There are no statutory rent provisions for a SLDT. SLDT's cannot be assigned to 3rd parties, but relatives can succeed to the tenancy. Statutory rules on fixed equipment and compensation for improvements at the end of tenancy apply. If the tenant continues in occupation at the end of a SLDT then a Modern Limited Duration Tenancy (MLDT) is automatically created. Where this happened before 30 November 2017 a Limited Duration Tenancy (LDT) was created.

Limited Duration Tenancies (LDT)

These are agricultural tenancies commenced before 30 November 2017 where the letting is for a minimum term of 10 years - with no upper limit (older LDT's were for a minimum of 15 years).

To end an LDT a Notice to Quit needs to be served by the landlord. This is a 2-staged process over three years. If the LDT is not terminated by notice at the expiry of the lease, there is instead a cycle of continuations. The tenant may terminate an LDT at the expiry of the contractual term or the expiry of a continuation by written notice given not less than one year and not more than two years notice.

The rules regarding repairs, improvements and rent reviews for LDT's are similar to those for 1991 Act Tenancies. LDT's can be assigned to a third party, subject to landlords' consent (landlords can only object on the grounds of the ability, finance or character of the assignee). Landlords

can also pre-empt an assignation by matching the highest offer. A LDT also gives the tenant the ability to use land for a non-agricultural purpose (diversification). Since 30 November 2017 a new 'Modern Limited Duration Tenancy' has replaced the LDT (for new agreements – see below).

Changes to Agricultural Holdings (Scotland) Act 1991

The 2003 Act made the following changes to the 1991 Act:

- *Fixed Equipment* – Post Lease Agreements (PLA) can be removed by the tenant giving notice to the landlord following a rent review; writing-down agreements for tenants improvements are no longer valid (there is some debate to whether improvements fully written-down before 2003 are included in this); record of condition no longer required to be completed by a Recorder appointed by Government.
- *Rent* – Various instructions on how to set rents were included, for which recent court cases have provided legal interpretation.
- *Diversification* – now allowed on agricultural holdings. The landlord has the right to object. The tenant is able to appeal to the Land Court
- *Compensation for Vacant Possession* - compensation may be payable to a tenant where a tenant voluntarily gives up possession of a holding.
- *Assignation* – details in following sections.
- *Miscellaneous* – leases can no longer be terminated on grounds of non-residency; Consent from the Land Court is required on a Notice to Quit in most circumstances; the definition of good husbandry now extended to include conservation activities and diversification, as permitted under the 2003 Act.
- *Tenants Right to Buy* – provides a pre-emptive right of a tenant (under a 1991 act tenancy) to buy land tenanted by him if the landlord intends to sell i.e. the tenant has the right of first refusal, provided the tenant has registered his interest. Registration is required with the Register of Community Interests and needs to be renewed every 5 years.

Land Reform (Scotland) Act 2016

The Land Reform (Scotland) Act 2016 received Royal Assent on 22nd April 2016. Much of the detail is being dealt with through "Secondary Regulation", which is ongoing.

Modern LDT

A new tenancy has been created known as a Modern Limited Duration Tenancy (MLDT). The tenancy is for a minimum of 10 years and has many of the same features as an LDT. For new entrants (regulations have been made to define a "New Entrant") there is a clause where the tenancy may be broken after 5 years.

Assignation

A tenant has the right to assign the interest in the tenancy to any one of the persons mentioned in a new subsection of the 1991 Act: *any person who would, or would in any circumstances have been, entitled to succeed*

to the tenant's estate on intestacy by virtue of the Succession (Scotland) Act 1964. The landlord's right to withhold consent, if there are reasonable grounds for doing so, continues to remain in force, unless the person to whom the assignation is being made is a near relative. The following list shows who qualifies as a near relative:

- A parent of the tenant.
- A spouse or civil partner of the tenant.
- A child of the tenant.
- A grandchild of the tenant.
- A brother or sister of the tenant.
- A spouse or civil partner of such a brother or sister.
- A child of a brother or sister of the tenant.
- A grandchild of a brother or sister of the tenant.
- A brother or sister of the tenant's spouse or civil partner.
- A spouse or civil partner of such a brother or sister.
- A child of such a brother or sister.
- A grandchild of such a brother or sister.

Where the assignee to a tenancy is a near relative the grounds upon which the landlord can object are restricted to the following:

- That the person is not of good character.
- That the person does not have sufficient resources to enable the person to farm the holding with reasonable efficiency.
- That the person has neither sufficient training in agriculture nor sufficient experience in the farming of land to enable the person to farm the holding with reasonable efficiency.

The provisions in relation to limited duration tenancies (LDT's) and Modern Limited Duration Tenancies (MLDT's) have been amended so that where the assignee is a near relative the grounds for objection are restricted to those mentioned above.

Succession

The succession provisions in relation to 1991 Act tenancies, repairing leases, LDT's and MLDT's are also made uniform.

The existing time limits to notify the landlord that a tenancy has been inherited remain in place. Where the lease permits a bequest of the tenant's interest, the tenancy must be accepted within 21 days of the death. In the case of intestate transfers, the deceased tenant's executors must transfer the tenancy to a suitable beneficiary within a year of the death. The beneficiary then has 21 days to notify the landlord that the acquisition has taken place. Where the successor, whether by bequest or on intestacy, is a near relative, the landlord has one month to object to the succession. However, the grounds of objection are limited to these to those listed in the previous section (character, resources and experience).

The 2016 Act abolishes the ‘viable unit test’ in relation to the unit that is being inherited and it also removes the specific challenge that the successor is already in occupation of an independent viable unit elsewhere.

Landlord’s Improvements

Tenants now have the right to object to improvements proposed by their landlord. The landlord has the right of appeal to the Land Court.

Diversification

There are new rules regarding the ability of a landlord to object to a tenant’s diversification notice.

Amnesty for tenant’s improvements

The tenant’s improvements amnesty came into effect on 13 June 2017 and provided a 3-year window for tenants with 1991 Act Tenancies, SLDTs, LDTs and MLDTs. Due to COVID-19, the deadline was extended to 13 December 2020.

Relinquishment and assignment of 1991 Act Tenancies

This part of the Act was brought into force on 28th February 2021. It allows a tenant to assign their tenancy for value to a person “who is progressing in farming” or a “new entrant”. The landlord has a right of pre-emption. If a tenant wants to go down this route, they must offer to relinquish the tenancy to the landowner in the first instance (it is independently valued). If the landlord does not accept the tenants notice to relinquish, the tenant may then assign the tenancy.

The Scottish Land Commission has issued a guide to the relinquishment and assignment process, which can be accessed using the following link: <https://www.landcommission.gov.scot/our-work/tenant-farming/relinquishment-and-assignment>

Irritancy for non-payment of rent

Irritancy Notices (a notice to quit) cannot be served for non-payment of rent on SLDT, LDT, MLDT & Repairing Tenancies unless a demand for payment within 2 months has been issued in writing by the landlord. This is not the case for 1991 Act Tenancies. For 1991 Act Tenancies, if rent is not paid, an Incontestable Notice to Quit can be served by the landowner (no rent demand is required).

Repairing Tenancies

A Repairing Tenancy has a minimum term of 35 years. The lease requires the tenant during the “repairing period” to improve the land into a state capable of being farmed. The repairing period will last 5 years, or longer if agreement between landlord and tenant or it can be extended by the Land Court.

***Land Reform (Scotland) Act 2016 reforms that have not commenced
(at the time of writing)***

Tenants' rights to buy

The requirement for a 1991 Act Tenant to register a right to buy has been removed. Tenants will now have a pre-emptive right to buy if a landlord "proposes to transfer the land or any part of it to another person". Until this section becomes live, the requirement for tenants to register their right with the Registers of Scotland continues. For more information see: <https://www.ros.gov.uk/>

Sale where landlord in breach

This provision allows a tenant to apply to the Land Court for an "Order of Sale" if a landlord fails to comply with an order or award of the Land Court, regarding a material breach of the landlord's obligations in relation to the tenant. The "order of sale" gives the tenant the right to buy the land comprised in the lease through the tenant's pre-emptive right.

Rent review (1991 Act Tenancies)

The rent is to be a "fair rent", which is to be a move away from the "open market" rent which has operated over recent years. The "fair rent" is to take account of the productive capacity of the holding; the open market rent of any surplus residential accommodation provided by the landlord; and the open market rent of any fixed equipment provided by the landlord or any land forming part of the holding not used for agriculture.

In the absence of agreement on rents, either party may apply to the Land Court to determine the rent.

The Scottish Government has appointed a group to carry out rent modelling. The favoured model will then undergo "road-testing" prior to being implemented. In the interim period, the industry has agreed to hold rents to inflationary rises only, this is being overseen by the Tenant Farming Commissioner. This is a voluntary agreement, supported by the industry stakeholders.

Rent review (LDT's, Modern LDT's and Repairing Tenancies)

The rent is to be set under the same guidance as the 1991 Act Tenancies. If there is no rent review provision in the lease, or the lease stipulates upward or landlord only initiated rent reviews, the statutory alternative applies.

Tenanted agricultural land rental figures (Scotland)

The following tables show median rental values for agricultural land by farm type and by tenancy agreement in Scotland for 2018-2020. These figures represent the latest available data which has been captured on a national level, as reported via the December agricultural survey. As from 2021, the December survey no longer includes this information.

Rents for farm type (all agreements excluding crofts and seasonal lets):

	2020		2019		2018	
	£/ha	£/ac	£/ha	£/ac	£/ha	£/ac
Cereals	137	55	134	54	137	55
General Cropping	143	58	149	60	143	58
Dairy	144	58	129	52	92	37
Cattle & Sheep non-LFA	127	51	121	49	129	52
Cattle & Sheep LFA	47	19	51	21	52	21
Mixed	123	50	123	50	118	48
Pigs & Poultry	125	50	154	62	124	50

Rents for tenancy agreement types:

	2020		2019		2018	
	£/ha	£/ac	£/ha	£/ac	£/ha	£/ac
Crofts/Small L'holdings	3	1	3	1	3	1
1991 Act						
<i>LFA</i>	47	19	52	21	55	22
<i>nLFA</i>	141	57	138	56	136	55
<i>P'ship</i>	75	30	75	30	83	34
SLDT	110	45	104	42	108	44
LDT	90	36	104	42	97	39
MLDT	86	35	87	35	87	35
Seasonal LFA	113	46	115	47	118	48
Seasonal nLFA	161	65	150	61	151	61

It must be noted that there will be a wide variation in rental values within each category illustrated above. Variables will include topology of the land, remoteness, length of tenancy, age of tenancy, facilities (e.g., houses, farm-buildings and equipment) included, and the amount of land rented. More detail can be sourced from:

<https://www.gov.scot/publications/results-december-2020-agricultural-survey/>

Space Requirements for Livestock and Storage

The following space requirements are included here as a guide (minimum area required) only. For livestock, appropriate welfare codes and quality assurance regulations should be referred to in all cases.

Cattle space requirements

<i>Liveweight (kg)</i>	Total floor area (m²/hd)						
	200	300	400	500	600	700	800
Beef cattle - solid floors	3.00	3.95	4.90	5.85	6.80	7.75	8.70
Beef cattle - slatted courts	1.10	1.50	1.80	2.10	2.30	2.50	-
Cow and calf - straw *	-	-	-	5.00	6.00	6.50	7.30
Cow and calf - slats *	-	-	-	2.50	2.75	3.00	3.25
Dairy cows - solid floors	3.00	3.95	4.90	5.85	6.80	7.75	8.70

*excluding creep area

<i>Liveweight (kg)</i>	Total floor area (m²/hd)					
	60	85	140	200	250	400
Calves - loose housed	1.50	1.80	2.40	3.00	-	-

<i>Liveweight (kg)</i>	Cubicle/pen dimensions (m)						
	<i>Calf pens</i>				<i>Cow cubicles</i>		
	< 60	60-80	400	500	600	700	800
Long	1.50	1.80	2.05	2.35	2.40	2.50	2.55
Wide	0.75	1.00	1.05	1.12	1.15	1.18	1.20

<i>Liveweight (kg)</i>	Trough/access length requirements (mm/hd)							
	100	200	300	400	500	600	700	800
Simultaneous feeding	350	400	500	550	600	670	700	800
Ad-lib feeding	150	150	150	190	240	280	320	340

Sheep space requirements

	Total floor area (m²/hd)		
	Hoggs	Pregnant ewes	Ewes w/ lambs
Sheep - bedded courts	0.75 - 0.90	1.00 - 1.40	1.80 - 2.20
Sheep - slatted courts	0.40 - 0.60	0.80 - 1.10	1.00 - 1.70

	Trough/access length requirements (mm/hd)	
	Hoggs (45-65kg)	Ewes (60-90kg)
Simultaneous feeding	300	450 - 500
Ad-lib feeding	100 - 125	120 - 225

Pig space requirements

<i>Liveweight (kg)</i>	Total floor area (m²/hd)						
	<10	10-20	20-30	30-50	50-85	85-110	>110
Group loose housed	0.15	0.20	0.30	0.40	0.55	0.65	1.00

<i>Liveweight (kg)</i>	Trough/access length requirements (mm/hd)						
	5	10	15	35	60	90	120
Restricted feeding	100	130	150	200	230	280	300

Poultry space requirements

<i>Laying Hens</i>		
Enriched cages	Stocking density	750 cm ² (approximately 13 birds/m ²)
	Nest/perch length	150 mm/bird
	Feed trough length	120 mm/bird
Barn or free range	Stocking density	9 birds/m ²
	Minimum litter area	0.025 m ² /bird
	Nest/perch length	150 mm/bird
	Feed trough length	100 mm/bird
Free range	Nest space (only)	120 birds/m ²
	Range area	<2500 birds/ha

<i>Broiler Chickens</i>		
Conventional	Stocking density	<33 kg/m ²
	Possible with permission	>33 - <39 kg/m ²
Free range	Stocking density	27.5 kg/m ²
	Range area	1 m ² /bird
Organic fixed housing	Stocking density	21 kg/m ²
	Range area	4 m ² /bird
Organic mobile housing	Stocking density	30 kg/m ²
	Range area	2.5 m ² /bird

Storage space requirements for crops, feeds and manures

Product	Space requirement
Wheat - whole grain	1.35 m ³ / t
Barley - whole grain	1.45 m ³ / t
Oats - whole grain	1.95 m ³ / t
Oilseed rape	1.45 m ³ / t
Beans and peas (combined)	1.16-1.19 m ³ / t
Distillers dark grains	1.82 m ³ / t
Draff (highly variable)	0.95-1.25 m ³ / t
Potatoes - bulk	1.42-1.59 m ³ / t
Potatoes - boxes	2.00-2.30 m ³ / t
Turnips/swedes	1.80 m ³ / t
Farm yard manure	1.1 m ³ / t

Weight and dimensions of hay, straw and silage bales

The weight of baled forages can vary a lot depending on the material being baled, type of baler and packing density, so weighing a selection of

bales, if possible, is the best estimate. Allowance should also be made for spoilage. The following table can be used as a guide.

Bale Type	Average weight (kg)		
	Hay	Straw	Silage
Round:			
1.20m x 1.20m	220-250	200-220	400-750
Rectangular:			
0.36m x 0.40m x 0.80m	19	16	36
0.40m x 0.46m x 0.90m	26	19	-
0.80m x 0.90m x 2.50m - mini hesston	290	250	350-650
1.20m x 1.30m x 2.50m - hesston	860	600	-
1.20m x 0.70m x 2.50m - quadrant	380	330	450-600
1.20m x 0.90m x 2.50m - 187	450	410	500

Silage density

To calculate the fresh weight of silage (tonnes) in pits (clamps) the following equation should be used:

$$\text{Silage (t FW)} = [\text{pit volume (m}^3\text{)} \times \text{density (kg/m}^3\text{)}] / 1000$$

The following table provides estimates for the density (kg/m³) for silages by considering the dry matter of the silage and the height of the pit. Grass, maize and wholecrop silages are of similar density.

Silage dry matter (%)	Clamp height (m)			
	2.0	2.5	3.0	4.0
20	780	840	890	950
25	690	730	775	830
30	620	660	690	740
35	570	600	625	670
40+	520	550	570	610

Source: DairyCo.

Water storage requirements

Water requirement for livestock and crops on farm will depend on various factors including animal size, feed intake, feed DM content, stage of production, crop type, rainfall, ground conditions, environmental temperature and management practices.

Significant volumes of water can be used on farm amounting to high water charges if metered mains water is the only water supply. The main water usage on farms includes, livestock drinking, dairy machinery (plate coolers), machinery (plant) and yard washing, crop spraying and irrigation and domestic use. There is potential to reduce annual water charges by investigating other water sources. These include boreholes, reservoirs (lagoons) and rainwater harvesting. With increasing climate change concerns, such systems will improve business efficiencies with both economic and environmental benefits (for more information see the Carbon section on page 331).

There are pros and cons to alternative water sources and planning and preparation is important when investigating new systems. Monitoring water use and ensuring there are no 'leaks' in the system (wastage, e.g. broken pipes, entry into slurry systems) is a key starting point. For further information on water use and for saving water on farms, see the following resources:

- <https://ahdb.org.uk/water-supply-problems-a-guide-for-livestock-farms>
- <https://ahdb.org.uk/knowledge-library/protecting-the-water-supply-for-your-crops>
- <http://www.ukia.org/>

Simple water storage tanks up to 10,000 litres could cost in the region of £1,000 while a rainwater harvesting system could be up to £2,600 for a large tank. These costs are ex VAT and do not include delivery and installation. For all the systems it is important to source specialist advice on storage requirements, regulation (local council, SEPA and quality assurance), design specifications (including water filters and treatment equipment) and installation.

The data below may be useful to help calculate water storage requirements on farm. All livestock figures are given as the volume of drinking water for one animal of the type described.

Cattle	
Dairy cow (in milk)	75-125 litres/day
Dairy cow (dry)	40-75 litres/day
Suckler cow (spring calving)	14-40 litres/day
(autumn calving)	40-70 litres/day
Calves	5 litres/day
Store cattle	15-50 litres/day
Finishing cattle	25-75 litres/day
Bulls	30-80 litres/day

Sheep	
Pregnant ewe	3-6 litres/day
Rams	3-6 litres/day
Intensively finished lamb	2 litres/day

Pigs	
Newly weaned	1.0-1.5 litres/day
Up to 20kg	1.0-2.0 litres/day
20-40kg	2.0-5.0 litres/day
Finishing pigs up to 100kg	5.0-6.0 litres/day
Sows and gilts (pre-serve and in-pig)	5.0-8.0 litres/day
Sows and gilts (in lactation)	15.0-30.0 litres/day
Boars	5.0-8.0 litres/day

Poultry	
Pullets	0.09 litres/day
Laying hens - caged	0.19-0.20 litres/day
Laying hens - non caged	0.19-0.22 litres/day
Broilers	0.19-0.20 litres/day
Ducks	1.22 litres/day
Turkeys	0.45-0.71 litres/day

Hose wash	
High pressure hose - typical flow rate (pumped)	1-2 m ³ /hr
Volume wash hose - typical flow rate (pumped)	5-10 m ³ /hr
Mains fed tap (example)	2.5 m ³ /hr
General parlour usage	18-45 litres/cow

Crop irrigation		
Spray gun		250 m ³ /ha
Spray boom	to apply 25 mm of	126 m ³ /ha
Drip tape	water per ha	18 m ³ /ha

Planning Permission and Building Warrant

In all cases of building work or change of use, it is advisable to consult with the local planning authority or take professional advice before development progresses.

As a rule, planning permission is required for all new developments and extensions including buildings, engineering, mining and other operations in, on, over or under land and for change of use of buildings or land. Following the recent adoption of the National Planning Framework 4 during February 2023, all new developments are now required to include appropriate measures to conserve, restore and enhance biodiversity.

Under the planning legislation, certain developments including proposed agricultural or forestry building works, demolition, freestanding domestic micro-wind turbines and domestic air-source heat pumps are considered permitted development. A developer must notify the planning authority of proposals using a Prior Notification form to determine whether prior approval in the form of a planning application is or is not required before exercising these rights.

Changes to the planning legislation which came into force on the 1st April 2021, significantly increases the size limit for agricultural buildings erected or extended (see requirements below) and also allows for the conversion of existing agricultural and forestry buildings to:

- Up to 5 dwellings (houses or flats), none of which may exceed 150m²
- Up to 500m² flexible commercial space

Scottish Planning Policy sets out the following requirements and fee structures. Contact your local planning authority or refer to The Town and Country Planning (Fees for Applications) (Scotland) Regulations 2022 for full context.

Prior Notification and Prior Approval

You should apply for prior notification and prior approval if any of the following apply:

- a) build or significantly alter/extend agricultural or forestry buildings. A significant alteration or extension is one which would result in:
 - the cubic content of the original building being increased by more than 20%, or
 - the height of the building exceeding the height of the original building
- b) form or alter a private way
- c) carry out excavation or engineering operations in relation to a farm or forestry undertaking

Application Fee is £100. The planning authority has 28 working days from receipt of application to respond and may request for a full planning application to be made if it considers that the development is likely to have a significant impact on the surroundings.

Prior Notification and Approval in relation to Agricultural and Forestry Private Ways

A developer should also apply for prior notification and prior approval to the relevant planning authority for the formation, or alteration, of agricultural or forestry private ways. No fee is applicable.

Planning Permission

Planning permission is always required if any of the following apply to the proposed development:

- a) carried out on farm holdings of less than 0.4 ha
- b) the construction, alteration or extension of a building (excluding permitted development)
- c) any buildings or works not designed for the purpose of agriculture
- d) the construction, extension or alteration of any building or structure or plant over:
 - i. 1000m² in area unless within National Parks or National Scenic Areas (this is calculated by adding the area of the proposed development and the area of any development within the unit that is to occur or has occurred within the preceding 2 years and would be within 90m of the proposed development), or
 - ii. 12m in height, or
 - iii. 3m in height where the building is within 3 km of an aerodrome
- e) within 25m of a metalled trunk or classified road
- f) the construction or carrying out of any works to a building used, or to be used, for housing intensive livestock or for storage of slurry or

sewage sludge where that building is within 400m of a protected building (a building normally occupied by people but buildings which form part of a working farm or certain specialist industrial buildings).

Planning fees, effective from 1st April 2022, are outlined below:

<i>Dwellinghouses</i>	
Planning permission in principle	
- one dwellinghouse	£600
- more than one dwellinghouse and the site area does not exceed 2.5 ha	£600 for each 0.1 ha
- more than one dwelling house and site area exceeds 2.5 ha	£600 for each 0.1 ha up to 2.5 ha plus £300 for each 0.1 ha in excess (maximum £75,000)
Detailed planning permission	
- dwellinghouses: not exceeding 10	£600 each dwellinghouse
- dwellinghouses: 11 – 50	£450 each dwellinghouse
- dwellinghouses: in excess of 50	£250 each dwelling to maximum £150,000
- enlargements, improvements or alterations to an existing dwelling house or flat and development within the cartilage of an existing dwelling house	£300
- erection or extension of buildings (other than dwelling houses or plant and machinery)	
- not exceeding 50m ²	£300
- >50-100m ²	£600
- >100-4,000 m ²	£600 + £600 for each 100 m ² (maximum £24,000)
- exceeds 4000m ²	£24,000 + £300 for each 100 m ² (maximum £150,000)
- ancillary buildings, fences, walls, roads, carparks etc.	£300

<i>Agricultural buildings</i>	
Planning permission in principle	
- agricultural building (excluding glasshouses) based on area covered by development	£600 for each 0.1 ha up to 2.5 ha of site area plus £300 for each 0.1 ha in excess (maximum £75,000)
Detailed planning permission	
- buildings up to 500 m ² floor area	£500
- buildings in excess of 500 m ²	£500 for each 100 m ² (maximum £25,000)

Agricultural buildings (continued)	
- glasshouses or polytunnels used for agricultural purposes	£100 for each 100 m ² (maximum £5,000)
Land	
Winning, working or storage of minerals and waste disposal	
- site area not exceeding 0.1ha	£1000
- site area 0.1ha – 15ha	£1000 plus £500 for each 0.1 ha
- site area 15ha+	£75,000 plus £250 for each 0.1ha (maximum £150,000)
Operations for extraction of peat	£500 per 0.1 ha (maximum £6,000)
Vehicular access, car parks, service roads for existing uses	£500
Other engineering works or operations on land e.g. installation of floodlights, car parks, roads etc. not serving existing uses	£1000 £1,000 plus £500 for each 0.1 ha
- site area not exceeding 0.1 ha	£8,500 plus £250 for each 0.1ha (maximum £150,000)
- site area 0.1 ha – 15 ha	
- site area exceeding 15 ha	

Planning permission is valid for 3 years and you are required to notify the local authority on commencement and completion of the works.

Building Warrant

A building warrant is a legal permission to erect, convert, alter, extend or demolish a building. It ensures that the building or structure is built in accordance with the standards set out by the Building (Scotland) Regulations 2004 and that it protects people's health, safety and welfare. Permission must be obtained from your local authority for most types of building and alterations works.

All agricultural buildings on agricultural land in Scotland are exempt from the need for a building warrant except for the following:

- Buildings used to any extent for retail purposes (including storage of goods or exhibiting).
- Buildings over 280m² in area.
- Buildings within 6m or the equivalent of its height (whichever is less) of a boundary.
- A dwelling, residential building, office, canteen, or visitor centre.
- A dungstead, slurry or farm effluent tank.

Some non-agricultural buildings and extensions such as small garages and porches do not require a building warrant (refer to the latest version of Scottish Governments Non-Domestic Technical Handbook for further guidance, see:

<http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubtech>

In general terms, there is no building warrant requirement for agricultural buildings in England and Wales. There is a responsibility to check whether the development is compliant with building regulations which falls under Building Control Bodies. For further information, refer to online guidance found in: www.planningportal.gov.uk.

Fees payable with applications for building warrants depend on the estimated cost of the building. For more information refer to The Building (Fees)(Scotland) Amendment Regulations 2024 or contact your local authority. As from April 2024, the fees are:

Building cost (£)	Fee
Up to 5,000	£200
5,001-10,000	£219 + £19 per every £500 thereafter
10,001 – 20,000	£412 + £22 per every £1000 thereafter
20,001-100,000	£681 + £71 per every £10,000 thereafter
100,001-500,000	£1,295 + £117 per every £20,000 thereafter
500,001-1,000,000	£3,720 + £202 per every £50,000 thereafter
1,000,001+	£5,538 + £287 for every additional £100,000 or part thereof
Amendment of warrant (if additional cost is less than original or increases by no more than £5,000)	£150
Extension to warrant	£150
Conversion only	£200
Demolition only	£200
Amendment of warrant for demolition only	£100
Application for late building warrant (where work has already started)	200% of the fees above
Application for late building warrant (demolitions only)	£250
Submission of a completion certificate (where no building warrant has been granted)	300% of the fees above
Submission of completion certificate (demolitions or conversion only)	£400

It is worth considering that the fees above may be reduced where certificates from approved certifiers of design and construction are presented with a warrant application. For further guidance please contact your local Building Standards department.

Building warrant permission is valid for 3 years and you must notify the local authority on commencement and completion of the works. You will also be issued with a Construction Compliance and Notification Plan (CCNP) which will provide details of the keys stages of works which are required to be inspected by your local Building Standards department.

Wayleaves and Easements

What is a Wayleave?

- In general terms, it is a contractual licence which gives operators the right to install, use and maintain its equipment and the owner/occupier is compensated by annual payments to cover the financial impact of having equipment on their land.
- A Wayleave is a temporary right for the operators to use a portion of land, including the right of ingress and egress across the property/land to reach the parcel of land.
- A Wayleave does not automatically transfer to a new owner or occupier.
- Landowners/occupiers are restricted from building or growing anything which may adversely impede access to the installed equipment and it may mean the parcel of land is not eligible for BPS (Basic Payment Scheme).
- It is recommended to seek advice from an experienced professional to negotiate and agree the payment rates. Landowners/occupiers affected should be paid for the losses incurred when any operations are carried out on their land including construction or ongoing maintenance, typical losses include loss of crops; reinstatement costs; general disturbance and damage; and extra costs incurred working around the site.

What is Deed of Servitude (Easement)?

- A Deed of Servitude (or Servitude for short) is a legally binding agreement between the landowner and the utility provider which provides operators rights over land which they do not own, providing greater security than a temporary Wayleave for the operator.
- A single capital payment is paid to the owner/occupier providing permanent access.
- Once granted a Servitude cannot be rescinded by the landowner/occupier.
- A Servitude can be registered in the Title Deeds at the Land Registry.
- It is worthwhile considering timescales in negotiating a Servitude which may affect your works.
- Different utilities have varying requirements when it comes to Servitude areas and rights. For example, underground cables within arable land do not prevent all normal agricultural activities taking place above, however there are restrictions on buildings within the servitude area. Gas pipes have wider areas of restricted development. These restrictions may mean the parcel of land is not eligible for BPS (Basic Payment Scheme).
- It is recommended to seek advice from an experienced agricultural professional who can advise on the implications of the easement in terms of farming operations to help negotiate and agree capital payment.

- Landowners can ask for previously agreed Wayleave agreements to be replaced with a one-off payment by processing a Servitude, but not the reverse.

Guide to Building Costs

For up-to-date building cost information please contact your local contractor/supplier. Following significant fluctuations in component and material prices, construction costs have seen significant inflation over recent years. The sector is still affected by the availability and increasing costs of labour and high energy prices. The BCIS (Building Cost Information Service) forecasts that building costs will increase by 15% over the next five years (up to 2029).

In practice, the contractor's estimates will vary according to:

- site location, conditions and access
- area of the country
- specification and standard of finish of the building
- how familiar the contractor is with the type of work
- the contractor's current workload
- changes in cost of components and materials

To ensure you get an accurate estimate for the works, a detailed appraisal of the site conditions, services and existing building(s), together with detailed design drawings and a viable and appropriate specification should be provided.

Pollution and the Environment

Introduction

Scotland has a strong environmental brand, promoting wild open spaces, clean air, and clear abundant waters. However, these environmental assets can be easily degraded through unintended actions or poor management of routine operations. A range of legislative requirements are in place across all sectors to help reduce pollution risk and protect and enhance our environment.

Environmental legislation covers most farming activities. A useful starting point for all businesses is NetRegs (www.netregs.org.uk), an initiative to help small businesses reduce pollution risks and improve their environmental performance. NetRegs has a section specific to agriculture, providing free, clear guidance on environmental legislation.

The Prevention of Environmental Pollution From Agricultural Activity (PEPFAA) code of good practice provides a useful reference source for farmers and land managers and is available on the Farming and Water Scotland website at www.farmingandwaterscotland.org

This section summarises some of the main impacts on air, water and land quality in relation to agricultural activities and provides links for further information.

Protecting air quality

Scotland's air quality has notably improved over the last few decades, with monitoring data showing that our air now is cleaner than at any time since the start of the industrial revolution. That said, a renewed focus is being placed on air quality as more is being understood about its impact on human health, climate change and the wider environment. Ammonia, dust, odour and smoke can all cause issues leading to reduced air quality and negative environmental impacts. There is growing acknowledgement of the role that ammonia plays in climate change; for more information on gases contributing to climate change, see the Carbon section, pages 331-345.

Ammonia

Agricultural practices account for around 90% of ammonia emissions in Scotland. Ammonia can lead to plant damage and changes to sensitive surrounding habitats. Ammonia may create an odour nuisance impacting on farming neighbours and can create human health concerns when mixed with other pollutants from industrial processes and vehicle pollution, resulting in tiny particles that can damage the lungs and enter the bloodstream.

Ammonia is a gaseous form of nitrogen, contributing to the formation of nitrous oxides driving climate change. Loss of ammonia, for example from livestock housing, slurry and manure management and application,

and use of inorganic fertilisers, could lead to nitrogen oxide deposition many miles from the source. This can impact vegetation and nutrient sensitive habitats such as heathlands and bogs.

There are several mitigation measures farmers can consider to help reduce ammonia emissions, for example the use of protected urea, precision application techniques when applying slurry, which are now a requirement for most slurry applications, appropriate manure management in livestock buildings and inclusion of nitrogen fixers such as clover in grass swards.

Specifically designed shelter belts around animal housing and roaming areas have the potential to recapture ammonia emissions, disperse emissions and reduce nitrogen deposition, helping to minimise detrimental impacts.

Large intensive pig and poultry units above certain capacities are classed as industrial installations and are already regulated under the Industrial Emissions Directive and the Pollution Prevention and Control (Scotland) Regulations in terms of ammonia management.

Production of dust and odours

Odour and dust concentrations are not necessarily related, however activities that produce dust and odour could all constitute a 'nuisance' and have a negative impact on health and amenity, which could lead to legal action, a fine, or notice from your local council to restrict or stop business activities.

Good site management and maintaining high standards of cleanliness on farm will help to minimise odour and dust. For businesses already regulated under the Pollution Prevention and Control (PPC) regime, the permit will include relevant emissions controls covering dust and odour, including Best Available Techniques (BAT).

There is growing concern around the impact of very small dust particles on human health. Particles of this size are subject to Air Quality Standards (Scotland) Regulations 2010, based on the current understanding of health effects and exposure to air pollutants.

Burning

Since January 2019, burning on-farm waste is no longer an acceptable practice for most materials, with only a few exemptions remaining for woody/plant debris or untreated wood produced on site (an exemption will need to be registered on the SEPA website and the activity must not cause pollution or harm human health). Reuse, recover, recycle, or correct disposal are now the preferred options.

For those that have secured an exemption to burn materials on site, the process should not produce any dark smoke; the NetRegs website notes that "*you cannot use a defence of lack of visual evidence, if you burn materials at night for example. Evidence of burnt materials that could*

cause dark smoke, such as steel reinforcement from tyres, or plastic residues is sufficient". For more detail on exemptions around burning waste, visit the NetRegs site at www.netregs.org.uk/environmental-topics/waste/burning-waste-what-you-need-to-know/exemptions-for-burning-waste/

Scotland's Farm Advisory Service have produced a Technical Note on minimising plastic waste on farms at www.fas.scot/publication/technical-note-tn724-minimising-plastic-waste-on-farms/.

There is additional information for farmers and land managers at www.sepa.org.uk/regulations/waste/agricultural-waste/burning-on-farm-waste/ and www.netregs.org.uk/environmental-topics/air-pollution/preventing-air-pollution/burning-waste-controls/

Muirburn

Muirburn operations can also have a negative impact on air quality. The Muirburn Code outlines what measures are required under both good practice and legislation. For more details regarding safe Muirburn practices, see www.fas.scot/environment/biodiversity/muirburn-code/ and www.nature.scot/doc/guidance-muirburn-code. Cutting or swiping could be a practical alternative to burning for consideration on some sites.

For more information on issues and legislation around air pollution, see www.netregs.org.uk and www.scottishairquality.scot/

Protecting soil quality

Both climate change and changes in land use and land management will have an impact on soil quality. Poor soil management practices can increase the loss of organic matter, change soil biodiversity, and increase erosion risk. Increased urban development such as roads and housing, can reduce the land area available to deliver the important services that a well-managed topsoil can provide.

For farmers and land managers, the booklet '*Valuing Your Soils*' is an excellent resource providing case studies and information on practical measures other farmers have taken to improve and protect farm soils, plus field sheets on how to carry out a visual evaluation of soil structure (VESS). You can download a copy at: www.farmingandwaterscotland.org/downloads/valuing-your-soils-booklet-pdf/

In addition, the Scotland's Soils website provides useful information, including the National Soil Map of Scotland and a range of resources for land managers and developers at <https://soils.environment.gov.scot/>.

Several resources around soil protection and management are available through Scotland's Farm Advisory Service website, including information

on soil biodiversity, soil structure, nutrient budgeting and soil pH. See www.fas.scot/crops-soils/soils/ for more details.

Protecting water quality

Scotland's water quality is generally good, with huge improvements having been made over the last 50 years primarily due to the introduction of controls and regulation on point source discharges such as treatment plants and factories. However, there are still pressures affecting water quality in Scotland, including rural diffuse pollution, discharges of wastewater, abstractions, and historical adaptations.

Diffuse pollution is the release of potential pollutants from a range of activities that, individually, will have only a small effect on the water environment but, at the scale of a catchment, can have a significant cumulative effect. Examples of rural diffuse pollution risks include loss of inorganic and organic fertilisers through field run-off or poor application techniques, and livestock access to and significant poaching around watercourses, leading to erosion, soil loss, and contamination of water with faecal bacteria.

The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended), more commonly known as the Controlled Activities Regulations (CAR), apply regulatory controls over activities which may affect Scotland's rivers, lochs, transitional waters (estuaries), coastal waters groundwater, and groundwater dependant wetlands.

The measures under CAR cover land management activities which include forestry, agricultural and amenity uses. The regulations have been designed to be proportionate to risk; there are three tiers of authorisation:

- **General Binding Rules (GBRs)** - provide statutory controls over low-risk activities and were revised and updated in 2022. For land managers, the Diffuse Pollution GBRs (DP GBRs) include minimum working distances for activities bordering watercourses, such as, application of manures and slurry or in-field cultivation practices. Recent revisions have phased out the use of high trajectory splash plates for applying slurry, encouraging the use of low emission, precision application techniques such as dribble bar or trailing shoe alongside a requirement for 22 weeks slurry storage capacity for housed cattle (26 weeks for pigs). Compliance with the GBR rules act as authorisation to carry out the activity; you don't need to contact SEPA before conducting activities controlled by GBRs, but you must understand and follow the rules. The amendments to the rules have been summarised in the '*Know the Rules*' guides at www.farmingandwaterscotland.org/know-the-rules/

- **Registration** - covers low risk activities which cumulatively pose a risk to the water environment. An example of an activity requiring a registration would be abstracting between 10 to 50m³ water in any 24hrs from the water environment. A one-off fixed registration fee is payable.
- **Licence** – required for site-specific controls, particularly if constraints upon the activity are to be imposed. For example, the construction and operation of a borehole which will be or is intended to be greater than 200m in depth will require a licence from SEPA with a fee which may be payable on an annual basis, depending on the activity.

The CAR Practical Guide provides more detail at www.sepa.org.uk/media/dw5de0kh/car-a-practical-guide.pdf

For information on licencing abstractions from the water environment, see <https://www.sepa.org.uk/regulations/water/abstractions/>

Further information

Further guidance on funding, environmental policies, statutory requirements, and good practice guides are available at the following websites:

- Diffuse Pollution Priority Catchments: <https://www.sepa.org.uk/regulations/water/diffuse-pollution/diffuse-pollution-in-the-rural-environment/>
- Farming and Water Scotland; practical information for farmers to protect and improve water quality on the farm, including the *Know the Rules* guides. Visit Farming and Water Scotland at www.farmingandwaterscotland.org or find on Facebook and X@FarmWaterScot
- FAS Technical Notes: wide range of information aimed at both farmers and consultants. Contains a suite of Technical Notes focused on nutrient management www.fas.scot/publication/technical-notes/
- Nitrates Directive and Nitrate Vulnerable Zones (NVZ): Sets out what is required from farmers to comply with the NVZ rules. www.gov.scot/policies/agriculture-and-the-environment/nvz/
- Pollution Prevention and Control (PPC) Regulations. Large pig and poultry units are covered by the PPC Regulations: www.sepa.org.uk/regulations/pollution-prevention-and-control/



- PLANET Scotland, free nutrient management computer software: www.planet4farmers.co.uk
- SEPA Scottish Environment Protection Agency www.sepa.org.uk

Pollution accidents or incidents should be directed to SEPA's 24/7 pollution hotline: 0800 80 70 60.

Next Generation

Introduction

This section provides some vital information for those looking to get started in farming including starting an agricultural business, business planning, financial planning, and farming opportunities including joint ventures. There are also links and signposts to further information resources and initiatives.

Starting Up an Agricultural Business

There are specific rules and regulations that must be adhered to when managing land and keeping livestock. The following information provides key points of contact and measures that need to be considered when starting up an agricultural business at any level.

Business registration

A new agricultural business should be registered with the Scottish Government Rural Payments and Inspections Division (SGRPID). This can be done online (<https://www.ruralpayments.org>), by completing a registering a business form (PF01 – <https://www.ruralpayments.org/topics/your-business/forms/pf01-registering-a-business/>) or by contacting the local SGRPID office (<https://www.ruralpayments.org/publicsite/futures/topics/contact-us/>). To register a business the following information is required:

- Business details (name, start date, business type).
- Responsible person (name, address, contact information).
- Other personnel involved in the business (if more than three additional members need to complete a PF02 – <https://www.ruralpayments.org/topics/your-business/forms/pf02-additional-business-member/>).
- Intention to keep livestock (types of livestock).
- Land associated with the business.
- Feed business details - to register with Food Standards Scotland.

If applying for funding, a PF03 registering your bank details form – Sterling, will also need to be completed: (<https://www.ruralpayments.org/topics/your-business/forms/pf03-register-your-bank-details-form---sterling/>). All Scottish Government payments are now given in Sterling.

If the land has not previously been registered for agricultural use before, or the land is being transferred from another party following sale or lease, this will have to be done using a PF06 Land Maintenance Form (LMF) (<https://www.ruralpayments.org/topics/your-business/forms/pf06-land-maintenance-form/>).

On completion and submission of the above information, the business will be allocated a unique Business Reference Number (BRN).

The land associated with the business will either have or be allocated a Main Location Code (MLC) which is a unique identification which encompasses numbers associated with the county, parish and holding (CPH) location of the land. Both the BRN and MLC are important identifiers when corresponding with various regulatory bodies.

If you have croft land you are required to notify the Crofting Commission (www.crofting.scotland.gov.uk) of the change in landowner/tenant. You also must inform the crofting register of Scotland (www.crofts.ros.gov.uk).

Registering to keep livestock

When keeping livestock or if intending to keep livestock, the business must also register with the Animal and Plant Health Agency (APHA) (<https://www.gov.uk/guidance/contact-apha>). This requires details about the keeper, the business, the type of animals and the land. The MLC of the business is required when registering with APHA, so the above SGRPID registration process needs to have been completed first. Registering with APHA allows for a unique flock/herd mark to be allocated. The flock/herd mark is required, by law, for animal identification and traceability. For more information on livestock traceability see pages 113-117.

Other registrations

Registering for tax, national insurance, PAYE, VAT with HM Revenue & Customs will also need to be considered. Advice from an accountant should be sought, while some information can be found in the Taxation section, page 515, or at: <https://www.gov.uk/guidance/help-and-support-if-youre-self-employed>

In addition, registering with industry bodies such as quality assurance schemes, health schemes for livestock or farmers associations should be considered as part of good farming practice.

To aid with setting up your business, building a key network of advisors is essential including a banker, accountant, and solicitor. Invest time to source these individuals and work on building a good relationship with them. They have the potential to really benefit your business and will assist in matters that can save money, aid investments, and decision making.

Compliance measures

Farmers and land managers must comply with various regulatory measures which are related to the environment, public health, animal health and welfare and plant health. There are two main measures of cross compliance which include Statutory Management Requirements (SMRs) (see page 500 for more information) and Good Agricultural and Environmental Conditions (GAECs) (more information can be found in pages 544–547). Linked to these requirements, the following records should be held and/or submitted:

- Integrated Administration and Control System (IACS) Single Application Form (SAF) including evidence of the Whole Farm Plan elements.
- Nitrate Vulnerable Zone (NVZ) records
- Livestock registers including sheep annual inventory
- Spray records
- Livestock medicine records
- Agricultural survey and census returns

In addition and depending on the nature of the business, there may be other statutory requirements to consider including:

- HMRC - business annual taxation accounts, personal tax returns, VAT returns
- Employment - national insurance (NI), pay as you earn (PAYE), pensions
- Insurance - personal, employers, public liability
- Health and safety
- Quality assurance

Record keeping

Land managers and/or keepers of livestock are encouraged to keep records to, not only comply with regulation, but for management purposes to help monitor and improve business performance.

Additional records you may need to keep as a livestock keeper/land manager are:

- Nutrient management plan
- Farm waste management plan
- Crop records
- Livestock feed use records
- Livestock animal health plan
- Integrated pest management plan (IPM)
- Biodiversity audit
- Carbon audit
- Property repairs inventory
- SEPA licences e.g. sheep dipping, waste disposal, water abstraction/irrigation
- Enterprise financial records
- Pest control

Business Planning

For new entrants, business plans are commonly required when tendering for tenancies and/or seeking finance from a bank or an investment partner. Developing a business plan provides a potential landlord or lender with the knowledge that operational, personnel, marketing and financial aspects of the business have been considered thoroughly to make the business succeed.

A comprehensive business plan will address the financial viability of the proposed business, as well as describing what you want to achieve, how you will get there and the things you need to do along the way to be successful. The financial section of a business plan should document current and expected income and expenses, along with the ability to repay any debts such as borrowings.

Uncertainty will always be a feature of farming businesses. There are simply too many factors that are out with control of the business e.g., weather, supply and demand, world markets, etc. Factoring sensitivity into the financial aspects of the business by including a “plan B” or contingency scenario will show that the business is adaptable, and resilience has been built in. The impact of weather on livestock and crop yields and performance, and the price of inputs and outputs, e.g. if purchased feed increases by 10% in the year or if lambing percentage is 5% lower, are obvious factors to consider.

A business plan should contain the following:

- A clear executive summary, summarising all the key points of the plan and the individuals involved. This will be the first thing a potential landlord or funder will see and will create their first impression. Remember they are investing in you, and they want to know who you are, what your skills are, your background, etc at the start.
- An overview of the business - a description of the farm (land and buildings), type of business structure operated, and the enterprises practiced/planned.
- Information about the management team and staff – ownership, skills, experience, capabilities.
- Business objectives – short, mid, and long-term.
- Financial position and forecasts - likely profitability when fully established (worthwhileness) and annual budgets detailing expected cash flow for a 1-3 year period, and changes in equity in the years taken to establish the business (feasibility). A lender will also require a clear statement of capital provided at the outset alongside funding required.
- Marketing and sales strategy - planned approach of marketing and selling your chosen product(s) including the businesses’ unique selling point (USP).
- SWOT analysis - Strengths, Weaknesses, Opportunities, and Threats that show an awareness of internal, external, personal, physical, or financial influences and risks on the business.

New entrants, or even well-established farmers proposing a new enterprise, will find preparing and presenting a business plan very beneficial, as they communicate their ideas to lenders. Business plans can also be used to monitor progress and ensure the team are all working towards the same vision.

Financial Planning

Financial analysis and planning is a key aspect of any agricultural business no matter what size. The finances help to provide an overview of what has happened over the period of analysis or when budgeting what is going to happen.

The key points to consider are:

- Profit (loss) - this is used to express annual financial performance as part of the profit and loss account at one point in the financial year (often the year end) showing trading output (adjusted for valuations) less inputs (adjusted for valuation changes). The profit before depreciation is available to cover drawings, tax, and capital investment (the “cash needs” of the business).
- Capital - the net worth is shown on the balance sheet giving a snapshot of the assets and the liabilities of the business at one point in the financial year (often the year end). Assets should be based on market values to provide a true estimate of net worth.
- Cash - cashflow gives a clear indication, on an ongoing basis throughout the year, of the business bank account and, unlike the profit statement, includes VAT and is not adjusted for valuation changes, debtors, creditors, personal and capital transactions.

Whole farm budgeting

Taking into account farm enterprise information (either historical or predicted using the Farm Management Handbook), a business can benchmark both technically and financially. This information in conjunction with the financial descriptions for profit, capital and cash should help a business to prepare a whole farm budget.

A whole farm budget acts as a model of the business predicting income and expenditure over a period (usually the 12 months of the financial year of the business) and this can be monitored against actual income/expenditure during the year. This information allows the business to analyse performance and to make decisions about future strategies.

Some basic budgeting features are shown in the following text. Any figures that are presented in a budget must be supported by clear assumptions adjusted for sensitivities where applicable.

Profit (loss)

The trading profit and loss account of a business is often expressed in the following format:

OUTPUT
less
VARIABLE COSTS
equals

GROSS MARGIN
less
FIXED COSTS
equals
NET PROFIT/LOSS

Monetary values under the above headings do not necessarily represent all or exact cash transactions through the bank. The profit and loss account also includes adjustments for valuations, debtors, creditors, depreciation, personal income or expense, and capital transactions. Further definitions can be found on pages 1 and 2 while financial data for particular farm types can be found in the Whole Farm Data section on page 445.

Capital

The capital position of the business is shown by the balance sheet in the following format:

ASSETS
(e.g. land/buildings/machinery valuations, cash at hand, stocks, debtors)
less
LIABILITIES
Long/medium term and Current
(e.g. loans/mortgages, overdraft, hire purchase, other creditors)
equals
NET WORTH or OWNER EQUITY

The net worth of the business is essentially the value of assets available to the business after all liabilities have been cleared. When the net worth is valued against the total assets as a percentage, the resultant figure gives a clear indication of the business' capital position. While net worth and owner equity are used interchangeably, the percentage owned/owner equity is specifically a measure of the proportion of the business owned by the proprietor and is calculated using the net worth of the business divided by the total assets.

Cash

It is vital to know the cash position of the business as this relates to the bank balance. The cashflow considers the cash values of sales and expenses that would appear in the profit and loss account. In addition, the cashflow also takes into account cash items such as personal drawings, tax payments, and capital repayments for loans and hire purchases. The opportunity to save for future reinvestment can be identified by taking account of the cash needs of the business.

Financial targets and benchmarks

As well as technical enterprise performance targets/benchmarks, such as yield and lambing/calving percentages, a farm business will have

financial targets/benchmarks that it should consider while analysing performance or planning.

Analysis of the profit and loss account is an ideal starting point to prepare business figures to allow comparison to industry benchmarks. Businesses should analyse and present their accounts in a similar format to that presented below allowing an easy comparison. The whole figures under each analysis heading, e.g., variable costs, can then be converted to a Gross Output Analysis (GOA) which takes output at 100% and each analysis heading is divided by the output and multiplied by 100 to get a percentage. Current GOA targets are:

	Dairy	General (excl. pigs and poultry)
Output	100%	100%
Variable costs	< 40%	< 30%
Gross margin	> 60%	> 70%
Fixed costs	< 30%	< 45%
Profit	> 30%	> 25%

Pig and poultry farms are similar to dairy farms in that they typically generate high output, high variable costs (because of feed costs) and relatively low fixed costs owing to high output or turnover.

Target levels for owner equity to ascertain business performance and sustainability are:

- owner occupier > 60%
- tenant > 50%

The Whole Farm Data figures on pages 445-465 are industry figures based on real farms thus provide an ideal starting point for benchmarking. A business should consider the upper 25% performing categories as the main goal. Nevertheless, due to the nature of farming and the varying characteristics (e.g., geography, land quality, local climate, type of stock, etc.) that influence performance, a flexible approach should be taken when benchmarking. Once a farm is up and running and has its own data, benchmarking internally will provide additional information to help assess performance.

Business Structure

The most appropriate business structure for a new rural business depends on the plans for the business, the people involved and issue of land tenure. This will result in different legal, liability, and taxation implications, meaning professional advice from an accountant is recommended from the outset.

There are three common types of business structure:

- Sole trader - This is the simplest form of business since it can be established without legal formality. However, the business of a sole trader is not distinguished from the proprietor's personal affairs.
- Partnership - A partnership is similar in nature to a sole trader but because more people are involved it is advisable to draw up a written agreement and for all partners to be aware of the terms of the partnership. As for a sole trader, the business and personal affairs of the partners are not legally separate. A further possibility is to use what is known as a Limited Liability Partnership (LLP).
- Company - The business affairs are separate from the personal affairs of the owners, but this entails compliance with greater regulations.

Farming Opportunities

Availability of land is often mentioned as the main hurdle for new entrants entering agriculture as well as finance and sourcing capital.

Purchase

Farmland tends to have a high asset value relative to its income earning potential, requiring capital, a deposit, or security of a guarantor to buy. Land purchase can, therefore, be a substantial financial barrier to entry for aspiring farmers and expanding businesses alike. Very little land is transacted annually in Scotland.

The value of land has shown strong growth in recent years, driven by limited supply and increased demand, particularly from non-farming investors. However, there are now signs of the market slowing down. The data below compares 2022 to 2023 average land values for various types of land in Scotland (data: Knight Frank Scottish Farmland Index).

	2022	2023	% change over last 12 months
	Per acre		
Good arable	£11,034	£10,712	-3%
Average arable	£6,325	£6,636	+5%
Ploughable pasture	£4,822	£5,694	+18%
Improved permanent pasture	£4,034	£3,228	-20%
Hill	£1,495	£1,495	0%

The value of land will depend on the land grade, the location, access, neighbours, and available alternative uses. Natural capital, forestry potential, and carbon sequestration are becoming increasingly important influences in land valuation.

When looking to purchase it is essential to understand how borrowing money works, for example how much will the lender provide, how much deposit is required, what value of the property will be lent against, etc.

There are several other costs to think about when purchasing and should be budgeted for in a business plan. These include land and building transition tax (LBTT), legal fees, independent valuation fees, and advisor fees. Land and building transition tax (LBTT) is complex and there are numerous different scenarios for each purchase, more details can be found at <https://www.gov.scot/policies/taxes/land-and-buildings-transaction-tax/>.

When buying land, to avoid problems such as issues on the title and to negotiate Basic Payment, and access rights it is extremely important to involve a legal expert with experience of agricultural land transactions.

Once purchased, the land and property will become an asset to the business. Every opportunity should be evaluated to maximise the output and to increase the value of the asset e.g. diversification, grants, adding value, renewables.

There are numerous other routes to occupying land if purchasing is not a feasible option. The various routes are described below.

Tenancies

This is the most common route for new entrants to access land. It involves a landowner letting an area of land (often including sheds and a dwelling house) to a tenant for an agreed period of time and rent. The types of tenancies available include the following:

- Short Limited Duration Tenancy (SLDT)
- Modern Limited Duration Tenancy (MLDT)
- Seasonal Grazing or mowing tenancies

These are described in detail on pages 398-403.

Joint ventures

There is growing popularity in joint ventures as an alternative route to entry. These include:

- Contract farming
- Share farming
- Business equity partnerships

A joint venture can be considered as some form of co-operation, formed in a legal manner, between two or more parties to form a business relationship, other than as landlord and tenant. There are various benefits and reasons for the creation of these collaborative agreements including sharing risk, improving return on capital through combined resources and expertise, and accelerated growth. They can also avoid the need to create a formal farm tenancy. Examples of common circumstances in which joint ventures can be beneficial include:

- Land coming back in-hand after being let out. The owner may be inexperienced but wishes to retain vacant possession.
- The farm may not be large enough to be a viable holding on its own.
- The farmer may wish to release equity.
- To obtain economies of scale through splitting the cost of farming with others.
- The business may be in need of large capital investment.
- The owner may want to retire, not having a natural successor, but not ready to sell.
- There may be a substantial tax advantage.

Genuine joint venture agreements work well but must be more than a written document. Each party must be made aware of the associated advantages and disadvantages, as well as being provided with a clear definition of their role. In practice, it is important for both parties to abide by the governing rules to retain the advantages (including tax benefits) and avoid it being construed as an alternative legal entity such as a tenancy, partnership, or employer/employee relationship. The foundation to success with joint venture farming is finding the right mix of people, regular communication, and use of an independent advisor. Investment in advice from legal and financial specialists is highly recommended.

Contract farming

A standard Contract Farming Agreement (CFA) is the terms of understanding between two parties. That is, a landowner/occupier (known as the “farmer”) who has engaged the services of another (known as the “contractor”) to undertake farming operations over a fixed period (typically 3 to 5 years) on pre-arranged terms – it may be more simply understood as farming with contractors.

The farmer normally provides the land, buildings, fixed equipment (if required or agreed), a dedicated bank account, finance to administer the agreement and pay the required bills, and any farm knowledge. For this, they will receive what is commonly termed a basic retention/fee. This is agreed with the contractor in advance of the start of the agreement.

The contractor provides the labour, machinery (including its incurred costs) and management expertise. The contractor could be a neighbouring farmer, large farming company or traditional contractor. For this, they receive a basic contractor’s fee (usually quarterly or half-yearly).

Either party, via a separate livestock hire agreement, can supply breeding livestock (if applicable). Both parties agree the farming policy and the share of any divisible surplus in advance and meet regularly throughout the duration of the agreement to make management decisions and monitor progress.

For working examples of real contract farming case studies see <https://www.fas.scot/rural-business/new-entrants/inspirational-stories/inspirational-stories/>

Share farming

Share farming is an arrangement between two independent businesses. It is often confused with contract farming but there are some differences, for example:

- They are two entirely separate businesses working the same land.
- As separate businesses they share the value of the farms output (typically sales) rather than a fee plus share of net profit.

There is no standard share farming agreement. The details are a matter for the parties involved, but each party needs to bring complementary resources and skill sets. The share farming structure is not as popular as contract farming in the UK but is commonplace in New Zealand. It is possible to start as a share farmer with only a small share, then progressively build equity share (within the terms of the agreement) until owning most or all the stock and/or equipment. There are three conceivable paths for the agreement:

1. It may be a step towards farm succession.
2. If agreed, share farmer equity in livestock could be increased on renewal of the agreement.
3. Terminate the agreement:
 - a. allowing the share owner to follow an alternative plan.
 - b. to allow the share farmer to buy into another or larger farm.
 - c. liquidate to enable the share farmer to purchase their own farm and likely become a share owner.

Typically, the share owner/occupier provides the land, buildings, fixed equipment, fixed machinery, major maintenance of buildings and expertise along with paying a certain percentage of certain input costs. The share farmer/operator will provide the working machinery, moveable equipment, and technical ability and pay the balancing cost of inputs. Livestock are usually held in undivided shares. Output and certain input costs (direct costs) are split using pre-agreed allocations.

Equity partnerships

An equity partnership is an alternative way to invest in farming for those who are unable to finance a farm tenancy or ownership as an individual. It can also be an opportunity for outside investors and for existing farmers to grow their business. It may also benefit those wanting to release capital from land for alternative investments or allow partial retirement as part of a structured succession, particularly with non-family members.

An equity partnership is most likely formed as a company, with potentially multiple investors. These shareholders will pool their capital (equity), and possibly skills or resources, in the aim of generating higher investment growth. The company will identify and assess an investment option,

purchase the land, livestock plus necessary machinery and plant. This is funded through shareholder equity and bank debt, borrowed by the company.

There are various structures and the most appropriate will depend on the type of investor. Often one of the partners is employed as the farm manager, known as an equity manager. The board of directors will run governance. Each partner normally appoints one director to the board. This works well provided directors have the necessary and complementary skills. This responsibility or process can be contracted out, particularly where investor(s) are time limited, remote from the operation or opt to be a 'sleeping partner'.

Finance

Sourcing finance to develop and grow a fledgling business can be challenging. There are various lenders who are especially supportive of next generation businesses. It is essential that the business has a track record and credit history, and setting up a bank account as soon as possible, facilitates this. The lender will require a business plan and cash flows, demonstrating what the immediate and future plans are for the business as well as the cash requirements. The funding sought should match the requirements of the business. For short-term working capital e.g. seed, fertiliser, feed, etc. an overdraft should be requested, whereas capital for more permanent structures or machinery, asset finance or loan funding should be investigated.

Finance can be sourced through various means including, overdraft, short- and long-term loans and hire purchase agreements (see pages 511-512). Finance can often be negotiated, e.g., longer payment terms for purchasing seed and fertiliser and market finance for purchasing livestock. Some livestock markets have special terms which favour new entrants.

Finance comes with an interest rate, which is a charge for borrowing the money. This is calculated as a percentage of your borrowings, so if you borrow £10,000 and the interest rate is 5.25% you repay £10,525. Interest is calculated daily and charged monthly, quarterly or half-yearly depending on the terms and conditions agreed with the lender. The interest rate is calculated using the bank rate, also called the Bank of England Base Rate, along with other factors including the lender's margin, whether it is a fixed or variable rate interest rate loan and if it is a repayment or interest-only loan. Fixed interest rates are set for an agreed period, but variable interest rates fluctuate in line with movements in the bank rate. At the end of an interest-only loan term the capital still needs to be repaid in full, but under a repayment loan the capital is paid off along with the interest due, meaning it is fully repaid at the end of the loan term.

The capital demand of a business can be minimised to reduce the reliance on borrowing. Such methods would include using machinery rings to hire in equipment when it is required, rather than purchasing. In return labour can be hired out to offset the payment.

Next Generation Initiatives

Scottish Land Matching Service (SLMS)

This was launched in October 2019 in response to growing industry concern at the lack of opportunities for new entrants entering the industry because of limited availability of agricultural land for purchase or tenancies and difficulty in accessing capital funding. In 2023, SLMS expanded to offer crofting opportunities.

The aim of the SLMS is to restructure our industry by encouraging young people into farming/crofting and bringing new skills, new ideas and the next generation into agriculture. Joint Ventures are operational structures that allow for young people to start or develop a farming business; they also allow an existing farmer to further develop their business and/or reduce their day-to-day role on the farm. This free service is open to all and matches people looking for, and offering, opportunities and provides a service to facilitate workable arrangements. Those seeking opportunities currently outweigh the number of opportunities available.

The service has a website where both people seeking opportunities and available opportunities can be found. Although it should be noted that not all opportunities are shared publicly. Both parties can register their interest in the service through six simple steps:

- 1) Register online and specify what you are looking for.
- 2) Your basic requirements will be added to the database, please note - no personal information will be displayed.
- 3) The service will contact you to arrange a confidential discussion, to get more detail about your background, aims and objectives.
- 4) If there are any potential matches on the database, the service will facilitate an introduction and a discussion.
- 5) If the initial discussion is successful and both parties wish to pursue, the service will facilitate further discussions to aid in developing the best agreement for all parties.
- 6) Once an agreement is secured, the service will continue to be a source of free and independent advice as the venture and relationship develops.

For more details and to register either an opportunity or as a seeker, visit the SLMS website at <https://slms.scot/>

Farm Advisory Service – Next Generation in Farming Programme

The SRDP Farm Advisory Service (FAS) has a dedicated theme for new entrants and the next generation in agriculture. The FAS provides information and resources aimed specifically at the next generation in

farming across Scotland. These resources include inspirational stories, fact sheets, guidance notes, newsletters, webinars, and regional next generation meetings across Scotland. For more information visit the FAS website at <https://www.fas.scot/rural-business/new-entrants/>

In addition to the above there is grant support for one-to-one mentoring and specialist advice is available from experienced peers. For more details see <https://www.fas.scot/mentoring-new-farmers-crofters/>

NFU Scotland

NFU Scotland's Next Generation Committee is comprised of a diverse range of young farmers, next generation farmers and crofters who meet regularly to discuss opportunities and challenges faced by their peers and work to influence positive change and speak with one voice. For more information visit <https://www.nfus.org.uk/policy/new-generation.aspx>

Scottish Government assistance

The Scottish Government is extremely supportive in encouraging the next generation to farming, and to overcome barriers.

New entrants to agriculture and young farmers can apply to the [National Reserve](#) for allocation of entitlements for the basic payment scheme. This can be done while submitting a Single Application Form online, the deadline is 15th May on the year of application. To be eligible, new entrants must have started agricultural activity in 2013 or later and not have had agricultural activity in their own name in the five years preceding the start of the activity. To qualify as a young farmer, you must be under 41 years of age on the 31st December on the year of application and be setting up as head of the agricultural holding for the first time. Applications to the National Reserve need to be submitted no later than two years after the calendar year in which the current agricultural activity started, e.g. if the new entrant/young farmer started a business in 2014 then the last year of application would be 2016. Documentary evidence of date of birth and proof of status as head of business or having control of the partnership/legal person will also be required at time of first application.

Further details can be found at:

<https://www.ruralpayments.org/publicsite/futures/topics/all-schemes/national-reserve/national-reserve-full-scheme-guidance/>

New entrants to agriculture and young farmers applying for BPS are also eligible for the Young Farmer Payment, which is based on a maximum of 90 eligible hectares and paid at 25% of the average value of payment entitlements held for the scheme year concerned. This is available to applicants under 41 years old on 31st December in the first year they apply for BPS and lasts 5 years from the date the new entrant/young farmer took control of the business. Applications can be completed while submitting a Single Application Form online by 15th May each year. More details can be found at: <https://www.ruralpayments.org/topics/all->

[schemes/basic-payment-scheme/basic-payment-scheme-full-guidance/main-features---bps/](#)

The Scottish Government has formed a working group to develop and coordinate Farming Opportunities for New Entrants (FONE) aimed at identifying publicly and privately owned land that could be released for new entrants to farming.

For more details see:

<https://www.gov.scot/groups/farming-opportunities-for-new-entrants-fone/>

Whole Farm Data

Introduction

This section provides whole farm benchmarking data for typical farm types in England and Scotland.

Benchmarking is a valuable tool to appraise the financial performance of a business year on year, or in relation to the wider industry. In addition, the benchmarks in the following pages, particularly the fixed costs, when used in conjunction with the livestock and crop gross margin budgets shown earlier in the Farm Management Handbook are useful for budgeting purposes, strategic planning and to help assess potential 'What If' options.

Source of Contents for 2024

The data for England and Scotland has been produced using information from the Farm Business Survey 2022/2023 conducted in England by Promar International and by SAC Consulting in Scotland.

Data has been sourced from the publications listed below:

- Farm Accounts in England 2022/2023, Published December 2023.
- Scottish Farm Business Income: annual estimates 2022/2023, Published March 2024.

Full information for each survey can be found at:

- <https://www.gov.uk/government/statistics/farm-accounts-in-england-data-sets>
- <https://www.gov.scot/publications/scottish-farm-business-income-annual-estimates-2022-2023/>

The Farm Business Survey (FBS) is an annual survey providing information on the financial, physical and economic performance of commercial farm businesses to inform and evaluate policy decisions. It is intended to serve the needs of farmers, farming and land management interest groups, government, government partners, and researchers.

England

The Farm Business Survey covers all types of farming in all regions of England and includes owner occupied, tenanted, and mixed tenure farms. FBS only includes farm businesses with a standard output of at least 25,000 Euros, based on activity recorded in the previous June Survey of Agriculture and Horticulture. Results are weighted to represent the full population of farm businesses that have at least 25,000 Euros of Standard Output, equivalent to approximately £20,000. In 2022/23, the sample of 1,359 farms represented approximately 52,500 farm businesses in England.

The survey data is reported for each farm type as Farm Business Income (FBI). In simple terms, FBI is the output generated by the farm business

including Farm Business Support Payments, Environmental payments and the net income from Diversification Enterprises (that use farm resources) minus total farm costs and is, in most cases, very similar to net profit. FBI is the gross margin less the sum of the fixed costs, Basic Farm Payment (BPS) and net margin from diversification enterprises that use farm resources.

The farms are ranked according to the output and input values for farm type and allocated to performance bands based on economic performance percentiles:

- Low performance band - bottom 25% of economic performers
- Medium performance band - middle 50% of economic performers
- High performance band - top 25% of economic performers.

The tables present the data on a £ per farm basis.

Scotland

In Scotland, the Farm Business Survey is based on an annual survey of approximately 400 farms with an economic activity of at least 25,000 Euros of output, (equivalent to approximately £20,000) and are not considered as part-time farms (i.e. have a Standard Labour Requirement (SLR) of more than 0.5 labour units where 1 labour unit = 1,900 hours worked per annum). As the Scottish survey excludes farm types not in receipt of support payments; it does not include farms predominantly engaged in horticulture, poultry, egg production or pig production.

The benchmark data for Scotland is shown in the following tables for the upper 25% performing farms per farm type.

The data is represented on a £ per farm, £ per adjusted hectare, and % per output basis.

Average benchmarks for each farm type as well as more detailed physical and technical data are published on the FAS website <https://www.fas.scot/rural-business/business-tools/whole-farm-benchmarks-tool/>

Description of Farm Types

The farm types are characterised with reference to European Commission (EC) typology.

The data for the farm types in England is measured and represented by Standard Output (SO). The data for farm types in Scotland, shown in the following pages, are distinguished by standard gross margin (SGM).

England farm types

LFA grazing livestock farms: Farms with 50% or more of total area in the Less Favoured Area (both Disadvantaged and Severely Disadvantaged)

and with more than two-thirds of the total SO coming from sheep and beef cattle together.

Lowland grazing livestock farms: Farms with less than 50% of total area in the less favoured area and with more than two-thirds of the total SO coming from sheep and beef cattle together.

Dairy farms: Farms where the dairy enterprise, including followers, accounts for over two-thirds of the total SO.

Cereal farms: Farms where cereals, oilseeds, peas, and beans harvested dry account for more than two-thirds of the total SO.

General cropping farms: Farms with over two-thirds of the total SO coming from arable crops (including field scale vegetables) or a mixture of arable and horticulture crops; and where arable crops account for more than one third of total SO and no other group account for more than one third.

Specialist Pig farms: Farms on which pigs account for over two-thirds of the total SO.

Specialist Poultry farms: Farms on which poultry account for over two-thirds of the total SO.

Horticulture farms: Other farms where over two-thirds of the total SO comes from fruit, hardy nursery stock, glasshouse flowers and vegetables, market-garden-scale vegetables, outdoor bulbs and flowers.

Mixed farms: Farms where crops account for one-third, but less than two-thirds of the total SO and livestock accounts for one-third but less than two-thirds of total SO. It includes holdings with mixtures of cattle, sheep, pigs and poultry, and holdings where one or other of these groups is dominant.

Scotland farm types

Specialist sheep (mainly hard hill): Farms in the less favoured areas with more than two-thirds of the total standard output coming from sheep.

Specialist beef (LFA): Farms in the less favoured areas with more than two-thirds of the total standard output coming from beef cattle.

Cattle and sheep (LFA): Farms in the less favoured areas with more than two-thirds of the total standard output coming from beef cattle and sheep together.

Dairy: Farms where more than two-thirds of the total standard output comes from dairy cows.

Specialist cereals: Farms where more than two-thirds of the total standard output comes from cereals and oilseeds.

General cropping: Farms where more than two-thirds of the total standard output comes from all crops.

Mixed: Farms where no enterprise contributes more than two-thirds of the total standard output.

Definition of Terms

Enterprise output

Total sales for an enterprise plus the value of transfers out, crops and good in store and the value of produce used or consumed for which no cash is receivable (by the business) less expenditure on, and the value of transfers in of livestock.

Agri-environmental payments have been detailed in the English data however this data is not published in Scotland. Subsidy output and diversification surplus is shown separately from enterprise output.

Variable costs

Those costs, which can both be readily allocated to a specific enterprise and will vary in approximately direct proportion to changes in the scale of that enterprise. Examples of variable costs are:

- Seeds, fertilisers, and lime.
- Sprays and sundry crop expenses.
- Concentrate feeding stuffs (purchased or home-grown).
- Sundry livestock expenses (vet, medicine, tags etc).

Purchases of livestock are not treated as variable costs. They are deducted when calculating the individual enterprise gross output.

Gross margin

The Gross Margin is the Total Farm Output less the sum of Variable Costs of the business enterprises.

Fixed costs

Examples of fixed costs include:

- Labour - regular and casual labour.
- Power and machinery - repairs, fuel (including drying fuel), oil, electricity, contracting, crop and livestock haulage, machinery leasing and hire.
- Overheads - property repairs, rates, insurance, and miscellaneous (e.g., office expenses & professional fees).
- Depreciation * - machinery and property depreciation.
- Rent and finance - interest (bank, HP, and loans) and rent (excluding keep).

* *Machinery depreciation is calculated on a replacement cost basis. Rates of depreciation are intended to reflect the degree of deterioration of the asset.*

England - LFA Grazing Livestock Farms

	Lower £/farm	Average £/farm	Higher £/farm
OUTPUT			
Crops	1,200	2,600	9,100
Livestock	31,400	76,700	142,600
Agri-environment	5,200	10,800	36,900
Other	2,553	6,073	3,000
	<u>40,353</u>	<u>96,173</u>	<u>191,600</u>
VARIABLE COSTS			
Crop Specific Costs	3,400	6,500	10,500
Livestock Specific Costs	19,700	35,200	58,100
Contract costs	3,500	4,500	9,500
Casual labour	700	1,900	3,400
Sundry costs	3	36	67
	<u>27,303</u>	<u>48,136</u>	<u>81,567</u>
GROSS MARGIN	<u>13,050</u>	<u>48,037</u>	<u>110,033</u>
FIXED COSTS			
Labour	200	2,404	12,232
Power and machinery	13,672	19,489	26,400
Overheads	18,900	26,800	41,000
	<u>32,772</u>	<u>48,693</u>	<u>79,632</u>
FARM BUSINESS INCOME <i>(excl. BPS and diversification)</i>	<u>-19,722</u>	<u>- 656</u>	<u>30,401</u>
BPS	9,900	16,600	35,400
Diversification surplus	1,600	3,600	4,300
FARM BUSINESS INCOME	<u>- 8,222</u>	<u>19,544</u>	<u>70,101</u>
Farm Business Income £/ha	<u>- 103</u>	<u>145</u>	<u>209</u>
No. of farms in sample	25	96	46
Average farm size (ha)	80	135	336
No. of ewes	173	360	709
No. of breeding cows	8	21	25

England - Lowland Grazing Livestock Farms

	Lower £/farm	Average £/farm	Higher £/farm
OUTPUT			
Crops	3,500	13,700	34,300
Livestock	29,700	71,200	108,000
Agri-environment	3,200	9,600	14,700
Other	2,664	6,900	10,200
	<u>39,064</u>	<u>101,400</u>	<u>167,200</u>
VARIABLE COSTS			
Crop Specific Costs	2,600	8,100	13,800
Livestock Specific Costs	14,500	33,300	39,500
Contract costs	4,400	6,900	10,900
Casual labour	500	900	2,000
Sundry costs	110	355	472
	<u>22,110</u>	<u>49,555</u>	<u>66,672</u>
GROSS MARGIN	<u>16,954</u>	<u>51,845</u>	<u>100,528</u>
FIXED COSTS			
Labour	1,300	4,100	6,100
Power and machinery	13,635	21,000	29,500
Overheads	20,900	33,000	41,900
	<u>35,835</u>	<u>58,100</u>	<u>77,500</u>
FARM BUSINESS INCOME <i>(excl. BPS and diversification)</i>	<u>-18,881</u>	<u>- 6,255</u>	<u>23,028</u>
BPS	7,000	14,300	19,500
Diversification surplus	2,300	5,600	26,100
FARM BUSINESS INCOME	<u>- 9,581</u>	<u>13,645</u>	<u>68,628</u>
Farm Business Income £/ha	<u>- 174</u>	<u>130</u>	<u>501</u>
No. of farms in sample	40	137	91
Average farm size (ha)	55	105	137
No. of ewes	58	167	226
No. of breeding cows	14	20	25

England - Dairy Farms

	Lower £/farm	Average £/farm	Higher £/farm
OUTPUT			
Crops	11,000	41,500	24,900
Livestock	381,500	968,600	1,258,600
Agri-environment	3,800	9,100	13,000
Other	4,100	16,600	10,100
	<u>400,400</u>	<u>1,035,800</u>	<u>1,306,600</u>
VARIABLE COSTS			
Crop Specific Costs	21,300	57,000	55,600
Livestock Specific Costs	183,400	416,900	446,100
Contract costs	23,900	47,800	51,200
Casual labour	6,600	23,100	14,100
Sundry costs	13	800	119
	<u>235,213</u>	<u>545,600</u>	<u>567,119</u>
GROSS MARGIN	<u>165,187</u>	<u>490,200</u>	<u>739,481</u>
FIXED COSTS			
Labour	26,800	62,000	87,300
Power and machinery	49,015	101,925	96,339
Overheads	75,000	153,800	148,100
	<u>150,815</u>	<u>317,725</u>	<u>331,739</u>
FARM BUSINESS INCOME <i>(excl. BPS and diversification)</i>	<u>14,372</u>	<u>172,475</u>	<u>407,742</u>
BPS	14,900	23,200	25,500
Diversification surplus	5,100	19,800	11,000
	<u>34,372</u>	<u>215,475</u>	<u>444,242</u>
FARM BUSINESS INCOME	<u>34,372</u>	<u>215,475</u>	<u>444,242</u>
Farm Business Income £/ha	<u>330</u>	<u>1,306</u>	<u>2,414</u>
No. of farms in sample	56	136	70
Average farm size (ha)	104	165	184
No. dairy cows	116	214	287

England - Cereal Farms

	Lower £/farm	Average £/farm	Higher £/farm
OUTPUT			
Crops	144,200	307,900	532,800
Livestock	5,400	10,700	3,600
Agri-environment	7,000	13,000	22,600
Other	11,062	19,921	29,000
	<u>167,662</u>	<u>351,521</u>	<u>588,000</u>
VARIABLE COSTS			
Crop Specific Costs	58,000	94,700	131,900
Livestock Specific Costs	3,900	6,200	1,800
Contract costs	21,100	32,400	28,600
Casual labour	800	1,700	2,800
Sundry costs	500	1,500	2,000
	<u>84,300</u>	<u>136,500</u>	<u>167,100</u>
GROSS MARGIN	<u>83,362</u>	<u>215,021</u>	<u>420,900</u>
FIXED COSTS			
Labour	10,643	17,460	27,800
Power and machinery	34,297	52,382	66,004
Overheads	52,100	78,700	85,200
	<u>97,040</u>	<u>148,542</u>	<u>179,004</u>
FARM BUSINESS INCOME <i>(excl. BPS and diversification)</i>	<u>- 13,678</u>	<u>66,479</u>	<u>241,896</u>
BPS	20,300	30,600	48,300
Diversification surplus	7,900	28,200	38,600
	<u>14,522</u>	<u>125,279</u>	<u>328,796</u>
FARM BUSINESS INCOME	<u>14,522</u>	<u>125,279</u>	<u>328,796</u>
Farm Business Income £/ha	<u>105</u>	<u>599</u>	<u>973</u>
No. of farms in sample	46	145	71
Average farm size (ha)	138	209	338
No. dairy cows	59	114	187

England - General Cropping Farms

	Lower £/farm	Average £/farm	Higher £/farm
OUTPUT			
Crop	195,600	426,600	474,100
Livestock	2,300	37,100	21,300
Agri-environment	7,500	21,800	8,900
Other	25,300	29,125	21,000
	<u>230,700</u>	<u>514,625</u>	<u>525,300</u>
VARIABLE COSTS			
Crop specific costs	86,400	128,500	121,200
Livestock specific costs	1,300	21,900	6,700
Contract costs	30,100	36,800	36,500
Casual labour	7,700	6,400	2,900
Sundry costs	400	1,100	231
	<u>125,900</u>	<u>194,700</u>	<u>167,531</u>
GROSS MARGIN	<u>104,800</u>	<u>319,925</u>	<u>357,769</u>
FIXED COSTS			
Labour	23,412	38,521	18,310
Power and machinery	62,690	81,800	76,227
Overheads	92,000	123,500	81,100
	<u>178,102</u>	<u>243,821</u>	<u>175,637</u>
FARM BUSINESS INCOME <i>(excl. BPS and diversification)</i>	<u>- 73,302</u>	<u>76,104</u>	<u>182,132</u>
BPS	19,500	38,800	39,700
Diversification surplus	24,900	23,400	28,200
FARM BUSINESS INCOME	<u>- 28,902</u>	<u>138,305</u>	<u>250,032</u>
Farm Business Income £/ha	<u>- 189</u>	<u>499</u>	<u>944</u>
No. of farms in sample	19	56	21
Average farm size (ha)	153	277	265
Cereals (ha)	34	109	128
Potatoes (ha)	5	8.1	5
Other crops (ha)	55	97	74

England - Specialist Pig Farms

	Lower £/farm	Average £/farm	Higher £/farm
OUTPUT			
Crops	-	138,600	204,400
Livestock specific costs	-	941,300	218,500
Agri-environment	-	3,000	6,900
Other	-	33,900	32,000
	-	<u>1,116,800</u>	<u>461,800</u>
VARIABLE COSTS			
Crop specific costs	-	44,100	50,900
Livestock specific costs	-	757,500	88,100
Contract costs	-	29,100	19,700
Casual labour	-	2,900	3,100
Sundry costs	-	403	157
	-	<u>834,003</u>	<u>161,957</u>
GROSS MARGIN	-	<u>282,797</u>	<u>299,843</u>
FIXED COSTS			
Labour	-	68,000	30,000
Power and machinery	-	66,007	70,029
Overheads	-	159,558	98,500
	-	<u>293,565</u>	<u>198,529</u>
FARM BUSINESS INCOME <i>(excl. BPS and diversification)</i>	-	<u>- 10,768</u>	<u>101,314</u>
BPS	-	17,000	23,700
Diversification surplus	-	62,700	35,900
	-	<u>68,932</u>	<u>160,914</u>
FARM BUSINESS INCOME	-	<u>68,932</u>	<u>160,914</u>
Farm Business Income £/ha	-	<u>584</u>	<u>1,032</u>
No. of farms in sample	-	16	17
Average farm size (ha)	-	118	156
No. of sows	-	240	39
No. of other pigs	-	3,194	3,049

England - Specialist Poultry Farms

	Lower £/farm	Average £/farm	Higher £/farm
OUTPUT			
Crop	22,000	70,800	44,000
Livestock	627,700	1,482,000	1,058,800
Agri-environment	2,000	3,100	1,000
Other	500	9,900	1,500
	<u>652,200</u>	<u>1,565,800</u>	<u>1,105,300</u>
VARIABLE COSTS			
Crop Specific Costs	7,000	24,600	12,300
Livestock Specific Costs	454,400	1,089,300	687,000
Contract costs	35,600	27,000	10,400
Casual labour	1,800	6,000	5,200
Sundry costs	0	15	22
	<u>498,800</u>	<u>1,146,915</u>	<u>714,922</u>
GROSS MARGIN	<u>153,400</u>	<u>418,885</u>	<u>390,378</u>
FIXED COSTS			
Labour	34,500	59,200	16,605
Power and machinery	39,204	79,825	36,202
Overheads	152,669	225,341	146,437
	<u>226,373</u>	<u>364,367</u>	<u>199,244</u>
FARM BUSINESS INCOME <i>(excl. BPS and diversification)</i>	<u>- 72,973</u>	<u>54,518</u>	<u>191,134</u>
BPS	6,900	10,500	6,900
Diversification surplus	7,200	48,300	32,400
	<u>- 58,873</u>	<u>113,319</u>	<u>230,434</u>
FARM BUSINESS INCOME	<u>- 58,873</u>	<u>113,319</u>	<u>230,434</u>
Farm Business Income £/ha	<u>- 1,154</u>	<u>1,434</u>	<u>5,009</u>
No. of farms in sample	13	30	14
Average farm size (ha)	51	79	46
No. hens and pullets in lay	13,044	19,049	6,731
Other poultry	19,021	68,445	48,963

England - Horticulture Farms

	Lower £/farm	Average £/farm	Higher £/farm
OUTPUT			
Crop	47,800	741,300	874,900
Livestock	13	600	900
Agri-environment	3,400	1,800	2,300
Other	900	11,200	52,000
	<u>52,113</u>	<u>754,900</u>	<u>930,100</u>
VARIABLE COSTS			
Crop Specific Costs	12,400	276,100	298,200
Livestock Specific Costs	24	400	300
Contract costs	2,000	23,300	31,100
Casual labour	6,700	93,900	27,300
Sundry costs	8	3	0
	<u>21,132</u>	<u>393,703</u>	<u>356,900</u>
GROSS MARGIN	<u>30,981</u>	<u>361,197</u>	<u>573,200</u>
FIXED COSTS			
Labour	19,800	154,600	181,409
Power and machinery	10,119	84,205	50,103
Overheads	17,200	114,173	149,847
	<u>47,119</u>	<u>352,978</u>	<u>381,360</u>
FARM BUSINESS INCOME <i>(excl. BPS and diversification)</i>	<u>-16,138</u>	<u>8,219</u>	<u>191,840</u>
BPS	1,200	5,300	1,800
Diversification surplus	8,100	25,800	99,900
FARM BUSINESS INCOME	<u>- 6,838</u>	<u>39,318</u>	<u>293,540</u>
Farm Business Income £/ha	<u>- 526</u>	<u>690</u>	<u>13,343</u>
No. of farms in sample	13	44	19
Average farm size (ha)	13	57	22

England - Mixed Farms

	Lower £/farm	Average £/farm	Higher £/farm
OUTPUT			
Crops	52,900	154,000	310,100
Livestock	39,300	212,500	163,300
Agri-environment	11,900	9,700	20,600
Other	4,500	19,200	19,000
	<u>108,600</u>	<u>395,400</u>	<u>513,000</u>
VARIABLE COSTS			
Crop specific costs	24,900	53,500	85,600
Livestock specific costs	26,100	150,800	78,200
Contract costs	13,200	18,000	20,500
Casual labour	600	10,900	4,400
Sundry costs	307	1,400	486
	<u>65,107</u>	<u>234,600</u>	<u>189,186</u>
GROSS MARGIN	<u>43,493</u>	<u>160,800</u>	<u>323,814</u>
FIXED COSTS			
Labour	6,200	22,828	31,400
Power and machinery	30,259	55,326	76,342
Overheads	40,100	84,700	91,400
	<u>76,559</u>	<u>162,854</u>	<u>199,142</u>
FARM BUSINESS INCOME <i>(excl. BPS and diversification)</i>	<u>- 33,066</u>	<u>- 2,054</u>	<u>124,672</u>
BPS	15,400	23,200	42,500
Diversification surplus	2,200	19,300	34,400
FARM BUSINESS INCOME	<u>- 15,466</u>	<u>40,446</u>	<u>201,572</u>
Farm Business Income £/ha	<u>- 141</u>	<u>251</u>	<u>717</u>
No. of farms in sample	25	65	41
Average farm size (ha)	110	161	281

Scotland - Specialist Sheep (LFA) Farms

	£/farm	Upper 25% £/adj. ha	% output
OUTPUT			
Livestock	37,016	333	40
Crops	1,814	16	2
Subsidies	42,162	378	46
Diversification surplus	1,632	15	2
Other	8,911	80	10
	<u>91,535</u>	<u>821</u>	<u>100</u>
VARIABLE COSTS			
Livestock expenses	19,576	176	21
Crop expenses	1,416	13	2
	<u>20,992</u>	<u>189</u>	<u>23</u>
GROSS MARGIN	<u>70,543</u>	<u>632</u>	<u>77</u>
FIXED COSTS			
Labour	9,541	86	10
Power and machinery	9,467	85	10
Overheads	8,685	78	9
Depreciation	11,080	100	12
Rent and finance	813	7	1
	<u>39,586</u>	<u>356</u>	<u>43</u>
FARM PROFIT	<u>30,957</u>	<u>276</u>	<u>34</u>
No. of farms in sample	7		
Average farm size (ha)	111		
No. of ewes	547		
No. of breeding cows	-		

Scotland - Specialist Beef (LFA) Farms

	£/farm	Upper 25% £/adj. ha	% output
OUTPUT			
Livestock	99,277	940	56
Crops	17,548	167	10
Subsidies	37,123	351	21
Diversification surplus	4,219	40	2
Other	17,739	168	10
	<u>175,906</u>	<u>1,666</u>	<u>100</u>
VARIABLE COSTS			
Livestock expenses	32,453	307	19
Crop expenses	18,843	178	10
	<u>51,296</u>	<u>485</u>	<u>29</u>
GROSS MARGIN	<u>124,610</u>	<u>1,181</u>	<u>71</u>
FIXED COSTS			
Labour	4,263	40	2
Power and machinery	24,091	228	14
Overheads	16,333	155	9
Depreciation	28,939	274	16
Rent and finance	4,196	40	2
	<u>77,822</u>	<u>736</u>	<u>43</u>
FARM PROFIT	<u>46,788</u>	<u>444</u>	<u>28</u>
No. of farms in sample	24		
Average farm size (ha)	106		
No. of ewes	87		
No. of breeding cows	64		

Scotland - Cattle and Sheep (LFA) Farms

	£/farm	Upper 25% £/adj. ha	% output
OUTPUT			
Livestock	89,691	503	53
Crops	6,684	37	4
Subsidies	53,693	301	32
Diversification surplus	487	3	0
Other	19,299	108	11
	<u>169,854</u>	<u>952</u>	<u>100</u>
VARIABLE COSTS			
Livestock expenses	39,741	223	23
Crop expenses	10,667	59	6
	<u>50,408</u>	<u>282</u>	<u>29</u>
GROSS MARGIN	<u>119,446</u>	<u>670</u>	<u>71</u>
FIXED COSTS			
Labour	7,124	40	4
Power and machinery	18,394	103	11
Overheads	17,062	96	10
Depreciation	26,098	146	15
Rent and finance	6,606	37	4
	<u>75,284</u>	<u>422</u>	<u>44</u>
FARM PROFIT	<u>44,162</u>	<u>248</u>	<u>27</u>
No. of farms in sample	14		
Average farm size (ha)	178		
No. of ewes	498		
No. of breeding cows	37		
No. of other cattle	55		

Scotland - Dairy Farms

	£/farm	Upper 25% £/adj. ha	% output
OUTPUT			
Livestock	883,854	4,871	93
Crops	20,661	114	2
Subsidies	40,281	222	4
Diversification surplus	- 485	- 3	- 0
Other	10,589	58	1
	<u>954,900</u>	<u>5,262</u>	<u>100</u>
VARIABLE COSTS			
Livestock expenses	325,876	1,795	35
Crop expenses	44,345	244	4
	<u>370,221</u>	<u>2,040</u>	<u>39</u>
GROSS MARGIN	<u>584,679</u>	<u>3,222</u>	<u>61</u>
FIXED COSTS			
Labour	48,644	268	5
Power and machinery	90,871	501	10
Overheads	36,291	200	4
Depreciation	96,496	532	10
Rent and finance	17,271	95	2
	<u>289,573</u>	<u>1,596</u>	<u>31</u>
FARM PROFIT	<u>295,106</u>	<u>1,626</u>	<u>30</u>
No. of farms in sample	11		
Average farm size (ha)	182		
No. of dairy cows	210		
Output yield per dairy cow (lt)	7,867		
Revenue value (ppl)	45.17		

Scotland - Specialist Cereal Farms

	£/farm	Upper 25% £/adj. ha	% output
OUTPUT			
Livestock	5,034	38	1
Crops	222,719	1677	65
Subsidies	28,691	216	8
Diversification surplus	19,474	147	6
Other	66,339	499	19
	<u>342,257</u>	<u>2,577</u>	<u>100</u>
VARIABLE COSTS			
Livestock expenses	1,657	12	0
Crop expenses	71,443	537	21
	<u>73,100</u>	<u>549</u>	<u>21</u>
GROSS MARGIN	<u>269,157</u>	<u>2,028</u>	<u>79</u>
FIXED COSTS			
Labour	14,870	112	4
Power and machinery	37,374	281	11
Overheads	27,024	203	8
Depreciation	48,578	366	14
Rent and finance	9,092	68	3
	<u>136,938</u>	<u>1,030</u>	<u>40</u>
FARM PROFIT	<u>132,219</u>	<u>998</u>	<u>39</u>
No. of farms in sample	12		
Average farm size (ha)	133		
Cereals (ha)	88		

Scotland - General Cropping Farms

	£/farm	Upper 25% £/adj. ha	% output
OUTPUT			
Livestock	20,134	62	2
Crops	1,127,515	3,453	89
Subsidies	60,201	184	5
Diversification surplus	9,950	30	1
Other	52,204	160	4
	<u>1,270,004</u>	<u>3,889</u>	<u>100</u>
VARIABLE COSTS			
Livestock expenses	7,737	24	1
Crop expenses	256,681	787	19
	<u>264,418</u>	<u>811</u>	<u>20</u>
GROSS MARGIN	<u>1,005,586</u>	<u>3,078</u>	<u>80</u>
FIXED COSTS			
Labour	135,582	415	11
Power and machinery	191,994	588	15
Overheads	83,597	256	7
Depreciation	208,835	640	16
Rent and finance	96,926	297	8
	<u>716,934</u>	<u>2,196</u>	<u>57</u>
FARM PROFIT	<u>288,652</u>	<u>882</u>	<u>23</u>
No. of farms in sample	8		
Average farm size (ha)	326		
Cereals (ha)	164		
Potatoes (ha)	72		
Other crops (ha)	23		

Scotland - Mixed Farms

	£/farm	Upper 25% £/adj. ha	% output
OUTPUT			
Livestock	84,869	599	31
Crops	127,747	902	47
Subsidies	35,533	251	13
Diversification surplus	7,645	54	3
Other	14,387	102	5
	<u>270,181</u>	<u>1,907</u>	<u>100</u>
VARIABLE COSTS			
Livestock expenses	31,515	223	12
Crop expenses	48,110	340	17
	<u>79,625</u>	<u>562</u>	<u>29</u>
GROSS MARGIN			
	<u>190,556</u>	<u>1,345</u>	<u>71</u>
FIXED COSTS			
Labour	4,084	29	2
Power and machinery	33,292	235	12
Overheads	23,105	163	9
Depreciation	41,803	295	15
Rent and finance	8,103	57	3
	<u>110,388</u>	<u>779</u>	<u>41</u>
FARM PROFIT			
	<u>80,168</u>	<u>566</u>	<u>30</u>
No. of farms in sample	21		
Average farm size (ha)	142		
No. of ewes	31		
No. of breeding cows	40		
No. of other cattle	85		
Cereals (ha)	56		

Rural Aid Schemes

Introduction

Following the UK's departure from the EU, support schemes are now being funded by the UK Government and the devolved administrations.

Over the next few years, UK administrations are implementing transition periods whereby direct payments will be phased out and new policies and support frameworks are being put in place. The following sections provide an overview of the current schemes for each UK administration, with an indication of potential changes for the future. Relevant government websites should be viewed for more detailed information and up-to-date guidance.

Scotland

As part of the eligibility for some rural aid schemes livestock units are used by the Scottish Government to calculate stocking densities, these are as follows:

Type of stock	Livestock units (per head)
Beef cows (including suckling calves)	1.0
Dairy cows used for milk production	1.0
Other cattle (24 months and over)	1.0
Other cattle (6-24 months)	0.6
Calves	0.4
Ewes and gimmers (including suckling lambs)	0.15
Ewe hoggs	0.15
Other sheep	0.15
Goats (over 6 months old)	0.15
Alpacas (over 6 months old)	0.30
Farmed deer - stags (over 27 months)	0.40
Farmed deer - hinds, including suckling calves (over 27 months)	0.30
Farmed deer - juveniles (6-27 months)	0.20

The calculations of stocking densities using these figures should be carried out with the same methodology as is detailed on page 112.

Single Application Form

In Scotland, the Single Application Form (SAF) is the form that must be completed in order to claim payments under the following schemes:

- Basic Payment Scheme, including Greening and Young Farmer payments.
- Scottish Suckler Beef Support Scheme (Mainland and Islands).
- Scottish Upland Sheep Support Scheme.
- Less Favoured Area Support Scheme (LFASS).
- Agri-Environment Climate Scheme – annual recurrent options.
- Forestry Grant Scheme – annual maintenance and management grants.

- Rural Development Contracts – Rural Priorities annual recurrent options.

The SAF should be submitted online via Rural Payments and Services website, for which, land managers must be registered with Rural Payments and Services (www.ruralpayments.org). A handwritten paper SAF will only be considered by SGRPID in a very limited range of exceptional circumstances. To request a blank form, you must contact your local area office. The deadline for submitting applications is generally the 15th of May each year.

The SAF is a declaration of all the permanent and seasonal agricultural and non-agricultural land parcels greater than or equal to 0.10 hectare you have in the United Kingdom on the 15th of May as a separate IACS (Integrated Administration and Control System) business. Information declared includes:

- Areas of crops grown on an individual land parcel basis used to claim the Basic Payment Scheme and LFASS.
- EFA options and areas used to meet Greening requirements.
- Agri-Environment Climate Scheme, Forestry Grant Scheme and Rural Development Contracts options and areas.
- Livestock numbers on the holding on 1 March.

Within the SAF, there is also the option to claim for Young Farmer Payment, Less Favoured Area Support (LFASS) and the National Reserve.

While in preparation for the UK's departure from the EU, the Scottish Government introduced legislation in November 2019 which proposed to keep farm support approaches broadly the same until 2024. Following the publication of the Scottish Government's Vision for Agriculture in March 2022, Scottish Government has been seeking to streamline the process of applying for payments and have been operating some pilot schemes in preparation for the new agricultural support regime being introduced in 2025.

Direct Payments

Direct Payment Schemes implemented in Scotland in the 2024 scheme year included the Basic Payment Scheme (BPS), Young Farmer Scheme, National Reserve and Voluntary Coupled Support (i.e., Scottish Suckler Beef Support Scheme (Mainland and Islands) and Scottish Upland Sheep Support Scheme).

Basic Payment Scheme

To take part in the BPS and receive funding farmers and crofters need to:

- Be an active farmer and be involved in agricultural activity.
- Hold BPS entitlements.
- Submit a claim via a Single Application Form (SAF).

- Farm a minimum of three hectares of eligible land and have this land at their disposal on the 15th of May of the claim year.
- Have one eligible hectare of land for each BPS entitlement.
- Comply with Greening and a range of Statutory Management Requirements (SMRs) and standards on Good Agricultural and Environmental Condition (GAEC) i.e., Cross Compliance.
- Keep comprehensive, accurate, and up-to-date records.

Active farming

Applicants to the Basic Payment Scheme must meet the definition of a 'farmer' i.e., be a natural or legal person (or a group of natural or legal persons) whose holding/production units is/are situated within Scotland. They must also exercise an agricultural activity, e.g., the production, rearing or growing of agricultural products including harvesting, milking, breeding animals and keeping animals for farming purposes.

If the farmer or crofter has land that is naturally kept in a state suitable for cultivation and grazing, there are rules on exercising a minimum activity which must also be met - see page 471.

Entitlements

Based on the areas of eligible land claimed on the 2015 SAF, BPS Regions 1, 2 and 3 entitlements were allocated to eligible farmers and crofters. For Payment Regions 2 and 3 farmers were allocated 10% fewer entitlements than the area of land declared, this is due to a reduction co-efficient having been applied. Further information about the Payment Regions can be found in the following section:

Eligible New Entrants to farming can apply to the National Reserve for entitlements; other farmers and crofters can obtain entitlements by purchasing, leasing, inheriting them or due to whole holding transfers, business splits or mergers. Entitlements can be transferred by sale or lease, with or without land to another active farmer.

Payment regions and rates

Land parcels in Scotland are allocated to one of three payment regions:

Payment Region	Land use category
1	Arable, temporary, and permanent grass.
2	Rough grazing designated as LFA grazing category B, C or D and non-LFA rough grazing land.
3	Rough grazing designated as LFA grazing category A.

Farmers and crofters receive the same Basic Payment (BP) entitlement value per payment region.

The Greening payment rates remain the same for all farmers and crofters depending on the payment region.

The actual entitlement value for each year will be worked out once the total number of hectares of eligible land claimed for in each payment region is known and the overall budget for that period will be divided up according to the hectares claimed. As at the time of writing (June 2024) the 2024 payment rates have not yet been published, the payment rates for 2023 are shown in the following table.

Payment Region	2023 BPS rate (£/ha)	2023 Greening rate (£/ha)	2023 Combined rate (£/ha)*
1	147.64	75.92	223.56
2	32.51	12.85	45.36
3	9.46	4.30	13.76

Minimum activity

The minimum agricultural activities farmers or crofters must undertake to make the land eligible for the BPS is related to the Payment Region(s) applicable to the land, as follows:

Payment Region 1:

- Where agricultural production activities are undertaken, these can include the production, rearing or growing of agricultural products including harvesting, milking, breeding animals and keeping animals for farming purposes.
- Where no agricultural production activities are undertaken, the land must be maintained in a state suitable for grazing or cultivation, i.e., action should be taken to control injurious weeds and maintain access for livestock or machinery. On permanent grassland, existing stock-proof boundaries and water sources for livestock should be maintained; and on arable land, encroachment of scrub should be prevented.

Payment Regions 2 and 3:

- The normal minimum agricultural activity is to undertake an average level of stocking of 0.05LU/ha on all hectares for 183 days in each scheme year, or where justified, a lower minimum stocking density, in terms of numbers or period, which is in line with the carrying capacity of the land or as a result of an environmental management agreement may be acceptable.
- As an alternative to minimum stocking levels, an annual Environmental Assessment can be carried out.

Capping

All Basic Payment Scheme and Voluntary Coupled Support Scheme payments are capped at €600,000; payments over €150,000 will be reduced by 5%. The Scottish Government has the option to make amendments to capping and may make changes during the transition period.

Greening

Permanent grassland - the area of permanent grassland must be maintained, i.e., the ratio of permanent grassland compared to the total agricultural area declared must not decrease by more than 5%; this is managed at a national level. At the individual farm level, Environmentally Sensitive Grassland Areas must not be converted to arable production.

Applicants must prepare a Nitrogen Fertiliser and Lime Plan detailing how much inorganic nitrogen fertiliser and lime is applied to land parcels that contain permanent grassland (PGRS) or open grazed woodland (WDG). Parcels that also contain areas of arable and/or rough grazing do not need to be included. The plan must be prepared by the 9th of June each year, retained on the farm, and made available on request to any inspector as part of the land inspection or validation of the SAF.

Cross border businesses submitting a BPS/Greening claim for land in Scotland can only meet Greening requirements on land located and claimed in Scotland.

Ecological Focus Areas (EFAs) - businesses with more than 15 hectares of arable land need to ensure that 5% of this land is managed as EFA unless the exemptions below apply:

- Land certified as organic or in organic conversion.
- Businesses where more than 75% of the arable land is used to grow temporary grass, herbaceous forage, leguminous crops, or fallow.
- Businesses where more than 75% of eligible agricultural area is permanent or temporary grass or herbaceous forage.

There are seven EFA options that can be used in Scotland to contribute to farmer's or crofter's EFA commitments. Each option must be located on, adjacent to, or within five metres of arable land and be weighted according to the level of environmental benefit they deliver, see below.

EFA option	Location	Weighting factor	EFA area
Fallow land	(/ha)	1	1ha
Margins	(/ha)	1.5	1.5ha
Nitrogen-fixing crops	(/ha)	1	1ha
Catch crop	(/ha)	0.3	0.3ha
Green cover	(/ha)	0.3	0.3ha
Agro-forestry land including small and farm woodlands	(/ha)	1	1ha
Hedges – right to claim whole hedge	(/1m)	10	10m ²

Hedges – right to claim half hedge	(/1m)	or contiguous to a claimed EFA option On, adjacent to or within 5m of arable land or contiguous to a claimed EFA option	5	5m ²
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Full details on Scottish greening measures and requirements can be found at the following webpage: <https://www.ruralpayments.org/topics/all-schemes/basic-payment-scheme/basic-payment-scheme-full-guidance/greening---bps/>

Young Farmer Payment

Under the current Scheme rules, young farmers are entitled to a top-up payment of 25% of the average value of BP entitlements.

To qualify the applicant must be:

- A sole trader or head of the farm business and be less than 41 years of age on 31 December of the first year they apply to the BPS. For businesses where the young farmer is head of the business, this means that the applicant is the main shareholder/partner in the business, takes the majority share of any profits and makes the key business decisions.

The Young Farmer payment is applied for on the SAF, and evidence of eligibility also needs to be submitted i.e., date of birth, % share of business profits. The payment is limited to having between a minimum of 3 hectares and a maximum of max 90 hectares.

National Reserve

The National Reserve is used to allocate BPS entitlements to eligible:

- Young farmers - farmers or crofters who are less than 41 years of age on 31 December in the year of application and are setting up for the first time an agricultural holding as head of the holding.
- New entrants - farmers or crofters who started their farming activity in 2013 or later, who have not had any agricultural activity in their own name or at their own risk in the five years before the start of their current farming action.
- Farmers who have suffered a force majeure or exceptional circumstances event that has affected the potential value of their payment entitlements under the Basic Payment Scheme.

There is no paper application for the National Reserve; applications are completed online at the same time as the SAF.

Voluntary Coupled Support (VCS)

The Scottish Government use coupled payments to support the beef and sheep sectors. The Scottish Government have announced that this support will continue until 2028. To claim for coupled payments applicants must complete a SAF each year; the Main Location Code used

in the coupled payments claim forms must be the same as the one on the SAF.

Scottish Suckler Beef Support Scheme - Mainland and Islands (SSBSS)

Payments are made on owned or leased homebred calves that are at least 75% beef bred. The calves must be born on or after 2 December in the year before the claim is made and remain on the holding of birth for at least 30 days. Claims can be made online or by post until 31 December each year. The payment rates for the 2023 scheme year were as follows:

2023	£/calf
Mainland	105.10
Islands	151.24

From 2025 onwards, calves will only be eligible for a SSBSS payment if their dam has a calving interval threshold of 410 days or less. Maiden heifers are exempt from this requirement, their calves will qualify for a SSBSS payment. The calving interval threshold may reduce in future years, but it will not reduce by more than 10 days in any given year.

Scottish Upland Sheep Support Scheme (SUSSS)

To qualify for the scheme, 80% or more of the agricultural land must be in Payment Region 3 and less than 200 ha of the agricultural land must be in Payment Region 1. Payments are made on homebred ewe hoggs that are retained on the holding (including away wintering) from 1st December in the year claimed to 31 March the following year. Ewe hoggs must be less than 12 months old at the start of the retention period. The payment rate for the 2023 scheme year was as follows:

2023	£/hogg
All eligible hoggs	61.38

Claims can be made online or by post between 1 September and 30 November each year.

Rural Development Programme

For 2024, the Scottish Rural Development Programme (SRDP) will continue to be used to enhance the rural economy, support agricultural businesses, protect, and improve the natural environment, address the impact of climate change, and support rural communities up until 2026 with some potential changes being announced in 2025/26 linked to new conditions/new delivery requirements.

Current schemes under the SRDP are detailed in the following pages. Full details of the schemes, including further information on payments rates and application deadlines can be found at: <https://www.ruralpayments.org/topics/all-schemes/>

Fair Work First Conditionality.

Under the Fair Work First conditions introduced by the Scottish Government on the 1st of April 2024, organisations applying for some public sector grants will be required to pay their staff at least the real living wage and also provide appropriate channels to give workers an effective voice.

For the agricultural sector, this conditionality has been in place from the 1st of April for the Forestry Grant Scheme and the Crofting Agricultural Grants Scheme (CAGS). Going forward, where funding is allocated, conditionality will be applied from the opening of the next round of three other schemes:

- Agri-Environment Climate Scheme (AECS)
- Food Processing, Marketing and Co-operation (FPMC)
- Sustainable Agricultural Grant Scheme (SACGS)

Businesses intending to apply for any of these five schemes should read the Fair Work First Guidance – www.gov.scot/publications/fair-work-first-guidance-2/documents/

Less Favoured Area Support Scheme (LFASS)

LFASS is an area-based scheme which can be claimed for on the SAF at the same time as claiming for the BPS. It is paid to applicants who actively farm forage land in the LFA area which has been given a grazing category. The main eligibility criteria include:

- Declaring at least three hectares of eligible land on the SAF.
- Actively farming land declared on the SAF for at least 183 days or periods totalling 183 days in the year of claim.

To count as forage, this land must be available and accessible for use for maintaining livestock or producing a forage crop for at least seven months including 15 May.

The LFASS payment is calculated by adjusting the eligible (claimed) land from the SAF to work out a payable area. This payable area is then multiplied by the payment rate(s) for farmers and crofters fragility area. Providing the eligible area is at least 3 ha, the minimum payment made is £385.

Grazing categories are set based on historical stocking densities for the land being claimed and are fixed. The categories are:

Category	Stocking density (LU/ha)	Hectare value	Stocking Density	
			Min LU/ha	Max LU/ha
A	Up to 0.19	0.167	0.09	1.4
B	0.20 - 0.39	0.333	0.15	1.4
C	0.40 - 0.59	0.667	0.30	1.4
D	0.60 or more	0.800	0.45	1.4

An enterprise mix multiplier is used as a way of recognising the environmental benefits of a mixed stocking regime. Hectares claimed are multiplied by 1.35 if at least 10% but less than 50% of livestock units are cattle or by 1.7 if 50% or more of livestock units are cattle.

As well as grazing categories, LFASS payment rates are based on land category. The provisional 2024 payment rates are given below:

Land category	Standard ¹	Fragile ²	Very fragile ³
payment per adjusted hectare (£)			
More disadvantaged land (grazing categories A and B)	52.16	62.10	71.35
Less disadvantaged land (grazing categories C and D)	34.12	54.51	63.00

¹ Standard areas on the mainland with lower transport costs

² Fragile areas on the mainland where there is disadvantage resulting from higher transport costs

³ Very fragile areas on islands

An example calculation is shown below for illustrative purposes.

Assumptions:

- Farm in Standard area
- Less disadvantaged land, grazing category D
- 600ha eligible land declared on SAF
- Historic stocking density 0.5 LU/ha, 100% cattle

eligible hectares from SAF			600 ha
x hectare value for Cat D	x		0.80
= adjusted hectares	=		480 ha
x the enterprise uplift	x		1.7
= payable hectares	=		816 ha
x standard less disadvantaged rate	x		34.12
= final payment pre deductions	=		£26,242

For further detail see full scheme guidance at:

<https://www.ruralpayments.org/topics/all-schemes/lfass/>

Agri-Environment Climate Scheme

The Agri-Environment Climate Scheme (AECS) promotes land management practices which protect and enhance Scotland's magnificent natural heritage, improve water quality, manage flood risk, improve public access, preserve historic sites, and mitigate and adaption to climate change. Most Agri-environment applications require a full Farm Environment Assessment (FEA) covering the entire holding.

For the 2023 Scheme year, the area cap was removed for new applicants applying for conversion to and maintenance of organic land. For the 2024 Scheme year, the Improving Public Access option will not open for applications.

The 2024 application round opened in January 2024 with the targeted support focusing on the Agri-environment, slurry and digestate storage and seeking to double the amount of land under organic management.

Funding for heather cutting, and mechanical treatment of bracken, restoring of drystone or flagstone dykes and pond creation and restoration for wildlife (limited to 2,000m² per application) has been reintroduced, and the option for creation of hedgerows has increased from 500 metres to 1,000 metres per application.

AECS funding cannot be used to support works that you are required to complete as part of a statutory or legislative obligation.

While the grant funding for slurry stores and the Agri Environment Scheme have closed for 2024, the closing date for the Organic Scheme is given below:

Application windows	Opens	Closes
Organic conversion and maintenance (Stand-alone)	1 February 2024	31 July 2024*

* If part of a single application with Agri-environment management, deadline for applications was the 10th of June 2024.

For further details, see online at:

<https://www.ruralpayments.org/topics/all-schemes/agri-environment-climate-scheme/> Please note that AECS grant applications must comply with the Scottish Government's Fair Work First conditionality (see page 475).

Forestry Grant Scheme (FGS)

Funding is available for woodland creation, agroforestry, tree health, woodland improvement, sustainable management of forests, harvesting, and processing of forest products, forest infrastructure and co-operation. (Please see Forestry and Farm Woodlands section on page 307 for more details). Please note that FGS grant applications must comply with the Scottish Government's Fair Work First conditionality (see page 475).

Crofting Agricultural Grant Scheme (CAGS)

This scheme provides grants for crofters to make improvements to their crofts and help to sustain their businesses. Funds can be used for capital projects, such as the construction or improvement of agricultural buildings and for the establishment of Common Grazings Committees. Funding for eligible capital projects can cover all aspects of the project, including the cost of materials, transportation of materials, costs of contractors and own labour. See pages 272-273 for more detail.

Please note that CAGS grant applications must comply with the Scottish Government's Fair Work First conditionality (see page 475).

Croft House Grant Scheme

This scheme provides grants for crofters to improve and maintain the standards of crofter housing, with the aim of attracting and retaining people within the crofting areas of Scotland. Funding can be used for the construction of a new house and the rebuilding and improvement of an existing house. See pages 272-273 for more detail.

Please note that Croft House Grant Scheme applications must comply with the Scottish Government's Fair Work First conditionality (see page 475).

SRDP Farm Advisory Service

The Farm Advisory Service (FAS) provides one-to-one and one-to-many advice and support, aimed at increasing the profitability and sustainability of farms and crofts.

The one-to-one component comprises of:

- Integrated Land Management Plans (ILMPs)
- Specialist Advice plans
- Mentoring of new entrants
- Carbon Audits

Funding of 80% (up to a maximum of £2,000) is available to help cover the costs of the preparation of an ILMP. Additional funds are also available for two specialist advice plans (100% funded up to a maximum grant of £1,600 per plan). Mentoring support is available to those that have set up or become the head of a farming business within the last five years. Applicants need to be registered in Scotland with the Integrated Administration and Control System (IACS) and hold a Business Reference Number (BRN). Mentors will be compensated for up to four days of their time.

Subject to the availability of funds, FAS can fund one carbon audit per year to help businesses assess their carbon footprint and to monitor their progress over time. The grant funding for the first carbon audit is £660 reducing to £330 for any repeat audits. Note: Businesses that have received funding through the Scottish Government's National Test Programme cannot apply for a carbon audit funded by FAS.

The one-to-many component of the FAS delivers innovative and integrated advice to crofters and farmers via:

- Scotland wide events i.e., workshops, network farm meetings, conferences, and training courses.
- Publications i.e., technical notes, newsletters.
- Crofts and small farms subscription service.
- A national advice line which operates between 9am and 5pm Monday to Friday (Tel: 0300 323 0161).

Women in Agriculture

The Scottish Government has committed each year until 2024/25 to support women through implementing the recommendations of the Women in Agriculture Taskforce. Women in Scottish agriculture can access financial support directly for practical skills training, by applying to the Women in Agriculture Practical Training Fund administered by Lantra. Further information can be found at:

<https://www.scotland.lantra.co.uk/women-agriculture-practical-training-fund>

Future Support Payments for Scotland

Following the UK's departure from the EU, the Scottish Government has published its 'Vision for Agriculture'. The Vision outlines the Scottish Government's ambition for Scotland to become a global leader in sustainable and regenerative agriculture, with a support framework for farmers and crofters that delivers high quality food production, climate mitigation and adaptation and nature restoration. The vision sets out the principles and values that will be at the heart of Scotland's future agricultural support regime from 2025 onwards.

The second edition of the Agricultural Reform Route Map sets out what changes recipients of current farm payments will be expected to make from 2025 and beyond. It also sets out the process of changing to a new agricultural support framework from 2026 including important dates, the measures being considered, when current schemes will transition or end, the support available and how to prepare for the changes.

From 2025, farmers and crofters will be required to adopt the following practices to qualify for support payments:

- Develop a 'Whole Farm Plan' which will include soil testing, animal health and welfare declaration, carbon audits, biodiversity audits and integrated pest management plans.
- Where appropriate, provide protections for peatlands and wetlands to help restore these vital habitats to sequester more carbon.
- Under the Scottish Suckler Beef Support Scheme, farmers and crofters will have to meet new conditionality in order to seek to cut emission intensity and to make beef production more efficient.

Further information on the Land Management and Change Plan for Scotland is available online at:

<http://www.ruralpayments.org/topics/agricultural-reform-programme/arp-route-map/>

National Test Programme and Preparing for Sustainable Farming

Post Brexit, the Scottish Government's National Test Programme (NTP) has been developed to support farmers and crofters to play their part in Scotland becoming a global leader in sustainable and regenerative agriculture. The NTP has a twin track approach. Track 1 is to encourage

farms to improve their knowledge of current environmental performance and efficiency. Track 2 is to design, test, improve and standardise the tools, support and processes necessary to reward farmers, crofters and land managers for the climate and biodiversity outcomes they deliver.

Preparing for Sustainable Farming (PSF), the first part of the NT Programme was launched in Spring 2022, aimed at encouraging farmers, crofters, and agricultural contractors to improve their knowledge of current environmental performance and efficiency. For 2024, the Scottish Government will continue to provide support funding for:

- Carbon Audits
- Soil Sampling and Analysis
- Animal Health and Welfare Interventions

Carbon Audits: Businesses with an online Rural Payments and Services (RPS) account can apply for funding up to £500 for a carbon audit, if they do not already have one or it is more than 3 years old. A carbon audit establishes a business's carbon footprint and identifies the sources and quantities of greenhouse gas emissions on farms/crofts and where simple changes can lead to improved efficiency, reduced operating costs and emissions.

Under the guidance notes, the carbon audit must be created using a recognised tool such as SAC's Agricultural Resource Efficiency Calculators (AgRE Calc (©)) and be aligned to Publicly Available Specification PAS 2050 standard. The report must have carbon management and emissions mitigation recommendations for the business going forward. Carbon audits must be carried out within the scheme year which runs from 1 January to 31 December with the option to claim up to the end of February the following year.

Soil Sampling & Analysis: Businesses wishing to apply for funding for soil testing will need to have the land included in the current year's Single Application Form (SAF) and must confirm that they have a carbon audit that is less than three years old, and as noted above, using an approved tool that aligns to PAS 2050.

Based on actual costs, funding of up to £30 per hectare for Region 1 land is available for soil testing for pH, phosphate, potash, and carbon. Testing for pH and carbon can be at either sample or land parcel level. Testing for magnesium and trace elements is recommended, but voluntary. Analysis will be paid at cost plus an additional £4 per sample where gathering these is not included in the analysis cost.

Each year, applicants can apply for funding to soil test up to 20 percent of the available Region 1 land on their holding. The maximum will be determined by the SAF claim for the same year. To ensure all suitable farming/crofting businesses can benefit, a minimal soil sampling

allowance of £300 will be available to small businesses whose area of Region 1 land means they would otherwise receive less than this amount.

To encourage all applicants to spend time researching best practice for soil sampling and nutrient management, a standard cost ‘development’ payment of £250 will be paid to eligible businesses during the first soil sampling claim process. Claims in subsequent years will not include a payment for development time.

Animal Health and Welfare Interventions: Under Preparing for Sustainable Farming, the introduction of Animal Health and Welfare Interventions is intended to optimise animal health and welfare, contributing to improved performance, efficiency, and lower emissions per kg of output.

As part of an initiative to encourage livestock keepers in Scotland to improve the health and welfare of their cattle and sheep, farming and crofting businesses with a Business Reference Number (BRN) and a flock/herd number can choose to undertake two interventions from the list below in each year the programme operates.

Bull fertility	Cattle - roundworms	Sheep lameness
Calf respiratory disease	Sheep scab	Sheep – liver fluke
Cattle – Liver fluke	Sheep iceberg diseases	Sheep - roundworms

Year one of the Animal Health and Welfare Intervention initiative opened on 1 January 2023 and closed on 31 December 2023. The second and final year opened on 1 January 2024 and will close on the 31st of December 2024. Claims for year two must be submitted by 28 February 2025.

Based on a payment of £250 per intervention and a ‘one-off’ Development Activity payment (time spent researching animal health and welfare best practice) of £250, livestock keepers were able to claim up to £750 in the first year and can claim £500 in the second year, giving a maximum of £1,250 per keeper over two years. Keepers who did not claim for funding in year one, will only be eligible for a maximum payment of £750 during the 2024 scheme year.

YourHerdStats: Linked to Preparing for Sustainable Farming, suckler beef producers have access to YourHerdStats, a new online tool within the ScotEID system that will securely present herd management information and highlight opportunities for further improvement. Through existing ScotEID login details, cattle keepers can gain access to a selection of herd performance indicators and trends including:

Calves registered	Cow & heifer efficiency	Stock sale date profiles
Cows calved	Cows retained percentage	Cow & calf mortality

From 2025, new conditions will start to be introduced to help businesses start to lower their emissions, introduce different ways of farming and help to increase efficiency. For up-to-date details on PSF, please see online at: <https://www.ruralpayments.org/topics/all-schemes/preparing-for-sustainable-farming--psf-/preparing-for-sustainable-farming--psf--full-guidance/>

Whole Farm Plans

From 2025, under the Whole Farm Plan initiative which has been designed to help farmers and crofters take a holistic view of their farm/croft in terms of efficiency, sustainability, carbon emissions and biodiversity; the Whole Farm plan will help businesses identify areas for improvement, and to subsequently allow them to assess the effectiveness of the improvements they carried out.

Farmers and crofters who intend to claim Basic Payment Scheme (BPS) will have to demonstrate that by the 15th of May 2025 they:

- have started to review and baseline their current business and livestock management practices and,
- are considering any changes required to ensure that their future agricultural activities are sustainable, efficient and resilient.

By the 15th of May 2025, in order to qualify for a Basic Payment, farmers and crofters will have to have in place at least two out of the five baselines. The five baselines and their review periods are:

Audit/Plan Name	Review Period
▪ Animal Health and Welfare Plan	Annual
▪ Integrated Pest Management Plan	Annual
▪ Biodiversity Audit	Five Yearly
▪ Carbon Audits	Five Yearly
▪ Soil Sampling and Analysis (Region 1 land)	Five Yearly*

* i.e. Every Region 1 field must be sampled once over a 5 year period and from 1 July 2024 must include analysis for soil carbon

Where members of Quality Meat Scotland (QMS), other Quality Assurance Schemes and/or production contracts such as a supermarket or milk company contract are required to have an animal health and welfare plan and/or a carbon audit as part of their membership/contract, these plans will qualify as one of the two baselines requirements as long as they meet the validation criteria in terms of quality and timescale.

While farmers and crofters are free to pick the two audits/plans that they feel would provide their business with the greatest initial benefit; the audits and plans an individual business will be required to carry out will

depend on their land classification and the agricultural activity carried out the holding:

- If you keep livestock, you will need an Animal Health and Welfare Plan by 2028.
- If you use pesticides (plant protection products), an Integrated Pest Management audit will be required by 2028.
- If you claim Region 1 land and apply artificial fertilisers and/or organic manures to it, a soil analysis will be required by 2028.
- All claimants will need a Biodiversity audit by 2028.
- All claimants will need a carbon audit by 2028.

Please note that each audit/plan shown within the table on the previous page has its own minimum review period.

In 2025, farmers and crofters who intend to claim Basic Payment Scheme (BPS) must:

- Check what audits and plans are required for their business.
- By the 15th of May 2025 ensure that they have at least two of the audits and plans relevant to their business in place completed.
- Ensure that the audits/plans meet the minimum standard for the Whole Farm Plan.
- Ensure individual audits/plans meet the validity period (see table on the previous page).
- Indicate on their 2025 Single Application Form (SAF) what audits/plans they have.
- Ensure copies of audits/plans can be shared with SGRIPD if required e.g. a biodiversity (audit) habitat map.
- Keep a record of any actions taken based on the information from the audits/plans.
- Complete all the required audits and plans relevant to their business by the 15th of May 2028 at the latest.

From 2025, as part of the on-farm inspection regime, SGRIPD will check that farmers and crofters have the audits and plans that they have indicated that they have on their 2025 SAF and that there are deemed valid (i.e. they meet the minimum standard and validity period).

Nutrient Management Plans which will provide recommendations for crop and grassland will be introduced to the Whole Farm Plan by 2028.

By the 15th of May 2028 at the latest, every farmer and crofter will be required to have carried out all of the Whole Farm audits and plans that are applicable to their business as a condition of receiving Scottish Government Agricultural support payments.

For further details of the Whole Farm Plan and the five baseline initiatives, please see online at: www.ruralpayments.org/topics/all-schemes/whole-farm-plan

Agricultural Support Package Beyond 2025

The Scottish Government plans to replace the current support measures with a four-tier system:

Tier	Aim/Support Focus
1. Base	To support active farming and food producers
2. Enhanced	For businesses that are high effective in farming for a better climate and/or for nature restoration.
3. Elective	Targeted actions to support nature restoration, innovation and the supply chains.
4. Complementary	New Skills, Knowledge and Training

Further information on the proposed four tier support is available online: <http://www.ruralpayments.org/topics/agricultural-reform-programme/arp-route-map/>

England

Direct Payments

In England, the Basic Payment Scheme (BPS), Young Farmer Scheme and the National Reserve closed in 2023.

Delinked Payments

From 2024, 'delinked' payments will replace direct payments previously made under the Basic Payment Scheme. The delinked payments will be made each year from 2024 until 2027.

Eligibility

To be eligible for the delinked payments, farmers and land managers must have been eligible for and claimed for Basic Farm Payments in the 2023 Scheme year, with the exception of eligible land inherited after the 15th of May 2023 (the BPD application deadline). BPS claims for 2023 must have been for at least 5.0 hectares, with 5.0 BPS entitlements in the same BPS region as the land. Farmers and land managers must also have a 'Reference Amount' which will normally be the average BPS payment made during the reference period (2020 through to 2022 BPS scheme years) including any Young Farmer or Greening payment.

As a departure from previous business support schemes, eligible businesses will not need to apply to receive delinked payments, they will be made automatically. At the end of 2023, the RPA sent out statements showing the reference amount based on the reference data held by the RPA at the time. The RPA will use this reference amount when they calculate the delinked payments each year.

Land and Entitlements

Farmers and land managers will not need any land or entitlements to receive the new delinked payments. Delinked payments for 2024 to 2027

scheme years will not be affected if a farm size changes, or if a business changes what the land is used for after BPS 2023.

Payment Rates & Progressive Reductions

The delinked payment will be based on the BPS payments received during the reference period 2020-2022. From 2024, the payment received each year will equal the reference amount minus the progressive reductions for that particular year. Payments will be made automatically to eligible businesses and will be made even if the business is no longer farming or occupying land.

Each year, direct payments will be progressively reduced until they are phased out in 2028 as shown in the table below:

Delinked Payments - Progressive Reductions from the 2020 Payment Values				
Payment Band	Up to £30,000	£30,000 - £50,000	£50,000 - £150,000	More than £150,000
2024	50%	55%	65%	70%

Different progressive reductions will be applied for years 2025 to 2027 as the delinked payments are gradually phased out. These reductions have not yet been announced.

Timing of Payments

From 2024 onwards, the RPA will make the delinked payments in two instalments – an advance payment of ~50% from 1 August in each scheme each year, with the balancing payments being made from 1 December onwards.

Lump Sum Exit Scheme

The lump sum exit Scheme closed on the 30th of September 2022. The scheme is not expected to re-open in future years. Applicants for the 2022 scheme had until the 31st of May 2024 to provide evidence that they have transferred their owned and/or tenanted agricultural land (unless it is planted in trees under the Woodland Creation Scheme).

If a farmer opted for the Lump Sum Exit Scheme, they will no longer be eligible for BPS or the new Delinked payments on this land unless they opt to repay some or all of the lump sum.

New & Revised Support Schemes for England

Environmental Land Management (ELM) Scheme

From 2022, under the umbrella of the Environmental Land Management (ELM) scheme, previous agricultural support payments have been replaced by three new/revised schemes:

1. Sustainable Farming Incentive (SFI)
2. Countryside Stewardship (CS)
3. Landscape Recovery (LR) Scheme

The three schemes have been developed to achieve the following outcomes:

- bringing soil under sustainable management,
- reducing agricultural emissions,
- woodland creation,
- halting the decline in species,
- reducing the main agricultural pollutants that enter watercourses,
- restoration of rivers, lakes, and other freshwater habitats,
- increase biodiversity and improve habitats,
- improve water and air quality, and
- improve natural flood management.

All the schemes are voluntary; farmers and land managers can decide whether or not they want to apply and what the right combination of schemes/actions is for their particular setting/business.

Sustainable Farming Incentive

The Sustainable Farming Incentive (SFI) was introduced in 2022 under the Agricultural Transition Plan. The SFI pays farmers and land managers in England to take up or maintain sustainable farming and management practices that:

- protect and benefit the environment
- support food production
- improve productivity

These practices are referred to as SFI 'Actions'

Eligibility & Duration of SFI Agreements

You can apply for a SFI agreement if:

- You are a farmer or land manager with 'management control of the land or landscape feature you want to enter into an agreement and will have management control of the land for the duration of the selected SFI action/s.
- Your land or landscape feature is eligible for the SFI actions you select.

You will be deemed not to have management control if you are:

- A landlord, as you are not actively farming or managing the land.
- A licensee who only has access to the land under a licence agreement.

Land or landscape features will be eligible for SFI actions if:

- The area or feature is in a land parcel that is entirely located in England.
- The area is an eligible land type – details of this are set out in each action.

- The area is registered on the business’s digital maps with an eligible land cover with a compatible land use code – details of this are set out in each action.
- The feature, such as hedgerows is eligible for each linear or feature based SFI action selected – details of this are set out in each action.

You cannot enter land or a landscape feature into your SFI agreement if it is being used for another SFI action, Countryside Stewardship (CS), Environmental Stewardship (ES) Scheme or SFI pilot standard that:

- Requires activities which are not compatible with the SFI actions you select and/or
- Means you will be paid twice for a similar activity on the same area of land at the same time (known as double funding).

Generally, SFI agreements are for 3-5 years.

SFI Actions

The SFI actions can be either:

Rotational	You can move the actions to different areas of the farm throughout the agreement.
Static	You must carry out these actions in the same location each year.
Agreement-level	These actions must cover all the relevant areas of the farm.
Limited Area	These actions must not cover more than 25% of the total agricultural area of the farm.

It is possible to add in additional actions to an existing SFI agreement annually, so you could, if you wish, add in additional land parcels or new actions as they become available in subsequent years.

SFI Expanded Offer

For 2024, from the 22nd of July, the SFI ‘Expanded Offer’ will be open for applications. The offer includes existing actions from SFI and CS schemes new actions that will be accessed via a single online applications service. The 2024 Scheme will have 102 available actions including new actions for uplands, precision farming, agro-forestry and climate resilience. Over 50 simplified CS options have been added, with shorter agreements that offer more flexibility.

Appropriate actions for individual businesses can be identified using the digital tool which is available online at: <https://www.gov.uk/find-funding-for-land-or-farms>

- Later in 2024, Defra will introduce: An educational access action, which will provide funding for educational tours of your farm or woodland.

- More endorsed SFI actions for farmland wildlife and habitats on grassland, heritage, wood pasture, orchards, coastal habitats and waterbodies.

Applying for a SFI Agreement

Before applying to the scheme, it is important to read the scheme guidance, to check the eligibility criteria and to ensure that all land details are up to date. The voluntary Guidance within the scheme provides details on how to carry out each action.

To apply for an SFI agreement, applicants are required to sign into the Rural Payments Service at <https://www.ruralpayments.service.gov.uk>

Payment Rates & Timing

The payment rates for the each of the SFI actions for 2024 are given in the 'Sustainable Farming Incentive (SFI) Handbook for the SFI Expanded Offer for 2024 offer' which is available to download on the gov.uk website.

SFI Management Payment

The payment rates are the same for farms in upland and lowland areas. The 2024 scheme includes a 'Management Payment' of:

- £40 per hectare for the first 50 hectares to cover participation costs for the first year of the scheme.
- £20 per ha in years 2 and 3.
- £7 per ha for common or shared land as part of a group agreement for groups of two or more.

To provide a reliable income, automatic payments will be scheduled quarterly. The first quarterly instalment will be paid in the fourth month following the SFI Agreement start date. A declaration must be submitted each year in order to receive the fourth instalment.

For further details of the Sustainable Farming Incentive scheme terms and conditions, please see online at:

<https://www.gov.uk/government/publications/sustainable-farming-incentive-scheme-expanded-offer-for-2024>

Animal Health and Welfare Review

The SFI Annual Health and Welfare Review is available to farmers who keep cattle, sheep and pigs and provides funding for farm visits to:

- Reduce endemic disease and conditions*
- Increase animal productivity
- Improve animal welfare.

* *At the time of writing (June 2024), endemic disease follow up is not yet available for dairy cattle.*

The current funding available is:

Species	Animal Health & Welfare Review	Endemic Disease Follow-up
Beef Cattle	£522	£837 if the review is positive £215 if the review is negative
Sheep	£436	£639
Pigs	£557	£923
Dairy Cattle	£372	N/A

The review is flexible, the farmers and their vet can decide what the health and welfare priorities are for the farm and to focus on these. Each review only covers one type of eligible animal. the priorities. For further information, please see online at: <https://www.gov.uk/guidance/farmers-how-to-apply-for-funding-to-improve-animal-health-and-welfare>

Countryside Stewardship Scheme

The Countryside Stewardship scheme provides income to farmers and land managers who deliver environmental benefits on their land, including increasing biodiversity, improving habitats for wildlife, pollinator plots, expanding woodland areas, improving air and water quality, and improving natural flood management.

For 2024, the Countryside Stewardship scheme is made up of eight grants, managed by the Rural Payments Agency. The scheme has two tiers:

Mid-Tier

The Mid-Tier provides funding for a range of options and capital items that will deliver a broad range of environmental benefits, for example protecting and enhancing the natural environment and the diversity of wildlife and water quality. For Mid-Tier agreements starting from 1st January 2024, applicants now have three years to complete their chosen capital works. Further scheme guidance can be found online at: <https://www.gov.uk/guidance/mid-tier-and-wildlife-offers-manual-countryside-stewardship>

Higher Tier

The Higher Tier provides multi-year and capital grant funding for more complex land in environmentally significant sites, commons, or woodlands which require support from Natural England, Historic England or the Forestry Commission. The 2024 application window will open during the winter, with the first agreements starting from early 2025 and will stay open throughout the year.

If you have a Countryside Stewardship (CS) or Higher-Level Stewardship (HLS) agreement, you can close your agreement early to apply for a Sustainable Farming Incentive or CS High Tier agreement.

Further scheme guidance can be found online at:

<https://www.gov.uk/guidance/countryside-stewardship-get-funding-to-protect-and-improve-the-land-you-manage#about-countryside-stewardship>

Woodland Support Grants

- The Woodland Management Plan grant.
- Woodland Tree Health grant.

Woodland Support grants are available through the Countryside Management Scheme. The 2024 application round opened on the 3rd of January. Applications will be accepted all year round.

The Woodland Management Plan grant is for financial support to produce a woodland management plan that meets UK Forestry Standard requirements. The plan must cover a minimum of 10 years.

The Woodland Tree Health grant provides one-off payments towards the cost of:

- Restocking woodland after a tree health problem.
- Felling diseased trees or rhododendron control.

Protection and Infrastructure grants

Protection and Infrastructure grants are for capital items that support improving the management of woodland and for managing the impact of beaver behaviours. Applications for Protection and Infrastructure grants are accepted all year round. The 2024 scheme year opened on the 3rd of January 2024.

Further scheme guidance can be found online at:

<https://www.gov.uk/government/publications/protection-and-infrastructure-grants-2024/applicants-guide-protection-and-infrastructure-grants-2024>

Capital Grants

Countryside Stewardship Capital grants are available as part of a revenue agreement (Mid-Tier and High-Tier) and/or as a standalone Capital Grant agreement. While applications for Countryside Stewardship Scheme Capital Grants are accepted all year round; applications will remain open until the funding is allocated. The 2024 scheme year opened on the 3rd of January 2024.

For 2024, there is no limit to the value of capital items that can be included in each of these groups:

- Boundaries, Trees, and Orchards
- Water Quality
- Air Quality
- Natural Flood management

For agreements starting from 1st January 2025, applicants now have 3 years to complete the capital works.

Further Capital grant scheme guidance can be found online at:

<https://www.gov.uk/government/publications/capital-grants-2024/applicants-guide-capital-grants-2024--2>

Farming Equipment and Technology Fund (FETF)

This fund provides grants for specific items of equipment and technology for farming, horticultural and forestry businesses. For 2024, the Farming Equipment and Technology Fund (FETF) scheme was split into three themes:

- Improving productivity
- Managing slurry

Improving Animal Health and Welfare

Grants are competitive with up to £50,000 of grant funding towards productivity and slurry items and up to £25,000 towards animal health and welfare items. Businesses can apply to one or both themes. In future, there may be a cap added for the total grant that can be claimed in one year.

The scheme guidance notes provide details of the expected cost of specific items of equipment and states the corresponding amount of grant being offered. Additional grant aid will not be paid if the actual cost of an item is greater than the value listed in the guidance notes.

The 2024 application period for the productivity and slurry grants ended on the 17th of April 2024 and the application period for the animal health and welfare grants ended on the 1st of May 2024.

For further details of each theme, the specific conditions of the grant and the respective application periods, please see online at www.gov.uk/guidance/farming-investment-fund

Farming in Protected Landscapes

This funding is available to farmers and land managers in England within an Area of Outstanding Natural Beauty, a National Park, or the Broads. Eligible projects must be designed to:

- Support nature recovery
- Mitigate the impacts of climate change
- Provide opportunities for people to discover nature
- Protect or improve the quality and character of the landscape

The Farming in Protected Landscape scheme is open all year round for applications and is administered through local protected landscape bodies. All projects must be completed by the end of March 2025. Competitive funding of up to 100% of the costs are available for eligible projects if the applicant will not make a commercial gain from it. If there will be an element of commercial gain, funding offered will be tailored according to how much the funding will benefit the business. For further details, please see online at www.gov.uk/guidance/funding-for-farmers-in-protected-landscapes

Wales

Direct Payments

Following the UK's departure from the EU, 2025 will be the final scheme year for the Basic Payment Scheme, Redistributive Payment Scheme, Young Farmer Scheme, and the National Reserve. The 2024 payment of the Basic Payment Scheme (BPS) will serve as the index for payments during the transition to the new Sustainable Farming Scheme.

The BPS year runs from the 1st of January to the 31st of December. For businesses claiming BPS, supporting documents need to be submitted by the 31st of December 2024. No payment (including BPS Advance Payment) will be made until evidence has been provided that an agricultural activity has been undertaken in 2024. The same deadline applies for submitting supporting documents for the Organic Conversion and for Organic Support. Businesses must inform the Welsh Government of any land transfers or changes to land parcels within 30 days of the change(s) taking place.

For eligible businesses and where all necessary documentation has been submitted, the Welsh Government intend to make an Advance Payment for BPS from the 14th of October 2024 of up to 70% of the value of the BPS 2024 claim. Balancing payments will be made from the 12th of December 2024 onwards.

Under domestic Rural Development legislation, financed by the Welsh Government, a set of Rural Investment Schemes have been developed to support the transition to the Sustainable Farming Scheme:

- Habitat Wales Scheme (HWS)
- The Organic Conversion Scheme (OSC)
- Organic Support (OS)
- Coetiroedd Bach (Tiny Forests)
- Small Business Grants Schemes
- Woodland Creation and Woodland Creation Planning Scheme
- Management Investment Scheme Food Business Accelerator Scheme
- Horticulture Development Scheme
- Growing for the Environment (Autumn sowing)
- Agricultural Diversification Scheme

For further details of the direct payment schemes and application dates please view online at: <https://gov.wales/rural-grants-payments>

Future Support Payments for Wales

Agri-Environment Schemes

Under the Rural Development Programme (RDP) for Wales, all remaining Glastir Entry, Advanced, Commons and Glastir Organic contracts ended

on the 31st of December 2023. No further claims can be made under these schemes.

The Small Grants – Environment is a stand-alone scheme providing a maximum of £7,500 per funding window for capital works. Set lists of capital works are available to support the delivery of beneficial environmental outcomes under the following three themes:

- Carbon
- Water
- Landscape and Pollinators

The application period for Small Grant Environment – Carbon closes on the 28th of July 2024. A further application window for the Small Grants – Environment is planned for later in the year.

The Growing for the Environment (Autumn sowing) Scheme offers a maximum grant of £5,000 to support the establishment of an unsprayed cover crop following autumn harvesting of cereals or maize where soil, after harvesting is ordinarily left bare/stubble retained. The next application window closes on the 12th of July 2024.

The Woodland Creation Planning Scheme provides a grant for a Registered Woodland Planner to provide advice and to write a woodland creation plan. Once the plan has been written, businesses can apply for a Woodland Creation grant. The 2024 application period for the Woodland Creation scheme ends on the 22nd of November 2024 or until the allocated budget has been committed. Selection is undertaken monthly.

The Small Grant Woodland Creation Grant Scheme is for tree planting schemes which are less than 2ha and offers support for planting only on eligible land which is included in the low sensitivity area shown on the Woodland Opportunities Map (WOM) which can be viewed online at: <https://datamap.gov.wales/maps/small-grants-woodland-creation/> Application dates are available on the Welsh Government website: <https://gov.wales/rural-schemes-application-dates>

Sustainable Farming Scheme

Following a further consultation period in March 2024, the Welsh Government is now planning to launch their new Sustainable Farming Scheme in 2026. This Scheme will be the main source of future Government support for farmers in Wales; the transition period for which will begin on 1 April 2025 and end on 31 March 2029.

The Sustainable Farming Scheme (SFS) will serve as the primary source of Government support for farmers in Wales. The Scheme will reward farmers for actions that align with the Sustainable Land Management (SLM) Objectives set out in The Agriculture (Wales) Act 2023. These are:

- To produce food in a sustainable manner
- To mitigate and adapt to climate change
- To maintain and enhance the resilience of ecosystems and the benefits they provide
- To conserve and enhance the countryside and cultural resources and promote public access to and engage with them, and to sustain the Welsh language and promote and facilitate its use.

The new support scheme will be primarily designed to meet the objectives of Sustainable Land Management (SLM) through encouraging sustainable food production, improving the resilience of agricultural businesses, addressing biodiversity loss, mitigating, and adapting to climate change, hitting clean air and water targets, and enhancing access and public engagement linked to health and well-being. Future payments will be linked to good farming practice, protecting/enhancing the environment, wildlife, and the Welsh scenery.

The Sustainable Farming Scheme is expected to have three layers:

- **Universal Actions (UA)** – will be mandatory for everyone joining the scheme. Businesses need to carry out these actions to receive the Universal Baseline Payment. These will be introduced in 2025. Proposed actions include benchmarking, continuous personal development, soil health, pest management, multi-species cover crops, environmental aspects including habitat management and managing heavily modified peatland, animal health and welfare, and good farm biosecurity.
- **Optional Actions** – targeted at specific land or landscape feature issues.
- **Collaborative Options** – aimed at delivering greater benefits that could be achieved by the sum of individual parts.

The Optional and Collaborative Actions will be introduced over the Transitional Period.

It is also being proposed that under the Scheme rules:

- At least 10% of each farm is actively managed as habitat for the benefit of wildlife alongside the production of food. Field scale species rich grassland will count towards the 10% requirement.
- At minimum of 10% tree cover as woodland or individual trees by 2030. Orchard trees and agroforestry systems will count towards the 10% minimum.

If a business does not have the 10% habitat needed to meet the scheme requirement, businesses can create new temporary habitat features on improved land, such as mixed leys or fallow crop margins.

For the minimum 10% tree cover requirement, areas unsuitable for tree planting linked to land classification, important ornithological habitats,

peatlands etc. will be excluded from the total farm area before the 10% requirement is calculated. The 10% requirement will be updated annually to reflect changes in land ownership/tenure. If a business cannot meet the 10% minimum requirement, new plantings will be required to meet the 2030 deadline. Special dispensations will be granted for tenants who cannot comply due to their tenancy agreements.

Young Farmers/New Entrants - the Scheme is being developed intentionally to remove some existing barriers for new entrants to gain support; the scheme will not include a need for entitlements, quotas or payment rates based on previous reference periods.

For the Universal and Optional layers of the scheme, the farmer must undertake agricultural or ancillary activities on agricultural land and have a minimum 3ha of eligible land or the farmer/business will need to demonstrate more than 550 standard labour hours.

Businesses will be required to complete a carbon assessment (carbon calculator) within the first year of joining the Scheme.

The Scheme will also be underpinned by bringing together agricultural legislation to create a set of National Minimum Standards. The Standards will initially be based on the existing legislation which underpins Cross Compliance requirements.

Support will be provided through training and farmer-to-farmer knowledge sharing and innovation. This will be provided through a new Farming Connect programme including a re-designed advisory service to ensure that the advice provided to farmers meets future needs.

For further information, please see online at:
<https://gov.wales/sustainable-farming-scheme>

Northern Ireland

Direct Payments

The Department of Agriculture, Environment & Rural Affairs, Northern Ireland (DAERA) offers payments to farm businesses through 'Area-Based Schemes (ABS) based on the land they farm, or actions they take on their land. ABS for 2024 included the Basic Payment Scheme (BPS), Young Farmers' Payment, Regional Reserve, and the Protein Crops Scheme.

For further details of the Area Based Schemes, please view online at:
<https://www.daera-ni.gov.uk/landing-pages/area-based-schemes>

While the current Basic Payment support system will continue to operate in 2024 with the existing land eligibility and cross compliance conditions; new schemes will be introduced from 2025 onwards.

Future Support Payments for Northern Ireland

From 2025 onwards, new support schemes will be introduced aimed at delivering four key outcomes:

- Increased productivity,
- Environmental sustainability,
- Improved resilience, and
- An effective functioning supply chain.

New Schemes being introduced will include the following:

Farm Sustainability Payment

It is planned that the new Farm Sustainability Transition Payment (FSTP) will be launched in 2025 together with new eligibility conditions. From 2025, farm businesses will need to activate five entitlements on a minimum of 5 ha of eligible land to meet the requirements of the Farm Sustainability Transition Payment, and from 2026, to meet the requirements of the Farm Sustainability Payment.

They will also be required to show activity in the two reference years, 2020 and 2021. Activity is defined as growing a crop or keeping livestock. Farm businesses that solely produced grass/grass silage and/or maintained land suitable for grazing or cultivation but undertook no further agricultural activity during the entire two-year historic reference period (2020 and 2021) will not be eligible to claim the Farm Sustainability Payment.

There will not be a system for leasing entitlements so inactive farmers will need to sell their BPS entitlements before the closure of the entitlement trading window in May 2025, otherwise they will cease to have a value.

With the planned introduction of a new Farm Sustainability Transition Payment in 2025, Basic Payment Scheme entitlements will expire and will be replaced with Farm Sustainability Payment entitlements. Payments will be progressively capped above £60,000 per farm business. The anticipated reductions are:

<i>Payment Band</i>	<i>Percentage Reduction %</i>
£0-£60,000	0
£60,000 - £80,000	20
£80,000 - £100,000	40
£100,000 - £150,000	60
£150,000 - £190,000	80

To be eligible for the new Farm Sustainability Payment, farmers must participate in the new **Soil Nutrient Health Scheme (SNHS)** which will provide farmers with a clear understanding of the soil nutrients in each field, which in turn, will help farmers to develop a Nutrient Management Plan to help achieve, and maintain, good soil health and nutrient status.

As part of the Soil Nutrient Health Scheme, farmers and land managers will be required to complete training being offered by the College of Agriculture, Food and Rural Enterprise (CAFRE). This scheme is being rolled out on a zonal basis. Zone 1 farms should have received a final report with a full set of results for each farm, Zone 2 sampling is underway, and Zone 3 of the scheme will be open for online registrations from June through to August 2024.

The **Beef Sustainability Package** will be made up of two elements; A Beef Carbon Reduction Scheme and a Suckler Cow Scheme aimed at improving productivity and profitability, resilience and reducing greenhouse (GHG) emissions.

The **Beef Carbon Reduction Scheme** opened on the 1st of January 2024. The scheme incentivises farm businesses to reduce the slaughter ages of clean beef cattle over a 4 year phased implementation period.

<i>Year of the Scheme</i>	<i>Maximum Age at Slaughter</i>
1	30 months
2	28 months
3	27 months
4	26 months

At present, there is no minimum slaughter age for the Beef Carbon Reduction Scheme.

Clean beef animals finished at, or below, the target age for the given year of the Scheme will receive a payment of £75 for each eligible animal slaughtered. To be eligible, beef animals must be born and bred in Northern Ireland and registered on the Northern Ireland Food Animal Information System (NIFAIS). They must have been kept within a herd associated to that farm business (on NIFAIS) for at least 60 days (continuously) within the last 100 days before the date of slaughter. Businesses must be eligible for BPS (2024); or from 2025, the new Farm Sustainability Payment.

There is a ceiling limit of 352,000 eligible animals, in total for all eligible businesses to ensure that the Scheme is production limiting. Payments will be capped at 352,000 animals per year. To prevent the ceiling being breached, the number of animals each farm business will receive payments for in any one year may be proportionately reduced.

The **Sucker Cow Scheme** is planned to open in early 2025. The Scheme has been devised to incentivise farm businesses to reduce the age at first calving and/or the calving interval of beef breed sucker cows over a four year implementation period. To qualify for payments under the scheme, the following maximum ages at first calving for heifers and maximum calving interval for suckler cows are:

<i>Year of the Scheme</i>	<i>Heifers - Maximum Age at 1st Calving</i>
1	34 months
2	32 months
3	30 months
4	29 months

<i>Year of the Scheme</i>	<i>Cows - Maximum Calving Interval</i>
1	415 days
2	405 days
3	395 days
4	385 days

To be eligible for payment, businesses must be eligible for BPS (2024) or from 2025, the new Farm Sustainability Payment. Payment will be limited to live calves registered on NIFAIS and a quantitative limit will be set at individual farm level.

A **Ruminant Genetics Programme** is being introduced to help drive improvements in productivity and environmental performance in the ruminant livestock sectors. The first phase of this programme will provide farmers with data and evidence to make better informed decisions to advance gain in dairy and beef animals. Training will also be provided by CAFRE to assist the industry to maximise the benefits of this programme. At the time of writing (June 2024), there is no specific programme for the sheep sector.

The **Farming with Nature (FWN) Package** will be open to all land managers with a minimum of 3 ha of eligible agricultural land who meet the scheme requirements, including compliance with the new Farm Sustainability Standards and participation in the Soil Nutrient Health Scheme.

Farming for Carbon will focus on actions to reduce carbon emissions and, by association, other emissions on farms and to offset these emissions through carbon sequestration.

The **Carbon Footprinting Project** will begin in Autumn 2024, with the first carbon reports to be with farmers shortly thereafter. The project is initially being rolled out in Year 1 and 2 of the Scheme to 11,200 members of the NI Beef and Lamb Quality Assurance Scheme (FQAS). Thereafter, the project will be rolled out to all remaining businesses. Under Section 19 (2) of the Climate Change (NI) Act 2022, the carbon audits will be fully funded.

The **Horticulture Sector Growth Support Scheme** is planned to commence in Autumn 2024 with the establishment of Subsector Growth Groups, along with a Growers Academy. An Innovation Support Scheme is planned for Autumn 2025.

The **Farming for Generations Pilot Scheme** is planned to commence in Autumn 2024 and will support farm businesses in planning for a timely and orderly transfer to a new generation. The Scheme is aimed at encouraging longer term planning for succession, development of the successor/successors and to maintain support for both generations including knowledge and skills development.

Further schemes and support measures will be introduced in due course with regards capital investment, knowledge transfer, innovation, and the development of supply chain measures.

For further details of the proposed new schemes, please see online at: <https://www.daera-ni.gov.uk/grants-and-funding>

Cross Compliance - Scotland

To receive support payments Statutory Management Requirements (SMRs) and Good Agricultural and Environmental Condition (GAEC) standards must be met; together they are known as “Cross Compliance.”

Under the current regulations, the following SMRs apply in:

Environment and climate change

- SMR 1** Nitrate Vulnerable Zones (NVZ)
- SMR 2** Conservation of wild birds
- SMR 3** Conservation of flora and fauna

Public health, animal health and plant health

- SMR 4** Food and feed law
- SMR 5** Restrictions on the use of substances having hormonal or thyrostatic action and beta-agonists in farm animals
- SMR 6** Pig identification and registration
- SMR 7** Cattle identification and registration
- SMR 8** Sheep and goat identification
- SMR 9** Prevention and control of transmissible spongiform encephalopathies (TSEs)
- SMR 10** Restriction on the use of plant protection products

Animal welfare

- SMR 11** Welfare of calves
- SMR 12** Welfare of pigs
- SMR 13** Welfare of farmed animals

The GAEC requirements are as follows:

- GAEC 1** Buffer strips along watercourses
- GAEC 2** Abstraction of water for irrigation
- GAEC 3** Protection of groundwater against pollution
- GAEC 4** Minimum soil cover
- GAEC 5** Minimum land management reflecting site specific condition to limit erosion
- GAEC 6** Maintenance of soil organic matter
- GAEC 7** Retention of landscape features

From 2025, new cross compliance conditions will be introduced. These are new peatland and wetland standards which will be added to GAEC 6 – Maintenance of soil organic matter. These standards will prohibit a range of activities from being carried out on peatland and wetland areas and include:

- Ploughing and cultivation; new drainage and maintenance of existing drainage systems that causes further drying out of peatland.
- Activities that cause damage to vegetation exposing the soil.

This will apply to land with peat soils more than 50cm in depth with a near vegetative cover and also to wetland habitats.

See page 544 for specific details on some of these GAEC requirements. For further information on SMR and GAEC, please see online at: <https://www.ruralpayments.org/publicsite/futures/topics/inspections/all-inspections/cross-compliance>

England:

As part of the ongoing changes to support payments, Cross Compliance ended on the 31st of December 2023. New regulations to protect the environment and animal health and welfare came into force on the 1st of January 2024. Details of the new regulations can be found online at: <https://www.gov.uk/guidance/rules-for-farmers-and-land-managers>

Wales:

The 2024 cross compliance regulations for Wales can be found online at: <https://www.gov.wales/cross-compliance-2024>

Northern Ireland:

The 2024 cross compliance regulations for Northern Ireland can be found online at: <https://daera-ni.gov.uk/publications/cross-compliance-2024>

Credit

Amortisation Table

The table below can be used to estimate the annual charge to service the repayment of loan capital and interest per £1,000 borrowed.

Years	Percentage rate of interest								
	2	3	4	5	6	7	8	9	10
1	1,020	1,030	1,040	1,050	1,060	1,070	1,080	1,090	1,100
2	515	523	530	538	545	553	561	568	576
3	347	354	360	367	374	381	388	395	402
4	263	269	275	282	289	295	302	309	315
5	212	218	225	231	237	244	250	257	264
6	179	185	191	197	203	210	216	223	230
7	155	161	167	173	179	186	192	199	205
8	137	142	149	155	161	167	174	181	187
9	123	128	134	141	147	153	160	167	174
10	111	117	123	130	136	142	149	156	163
11	102	108	114	120	127	133	140	147	154
12	95	100	107	113	119	126	133	140	147
13	88	94	100	106	113	120	127	134	141
14	83	89	95	101	108	114	121	128	136
15	78	84	90	96	103	110	117	124	131
20	61	67	74	80	87	94	102	110	117
25	51	57	64	71	78	86	94	102	110
30	45	51	58	65	73	81	89	97	106
40	37	43	51	58	66	75	84	93	102

Example:

The annual charge to service the interest and capital repayments on £8,000 repayable over 10 years at 5% would be £130 x 8 = £1,040. The payment at 6% would be £136 x 8 = £1,088.

The annual charge is given by:

$$C \times \left(\frac{r(1+r)^n}{(1+r)^n - 1} \right)$$

where: C = capital investment
 r = rate of interest (to 2 decimal places)
 n = years of repayment

Sinking Fund Table

The following table can be used to estimate the capital accruing to a regular annual investment of £100.

Years	Percentage rate of interest								
	2	3	4	5	6	7	8	10	12
1	100	100	100	100	100	100	100	100	100
2	202	203	204	205	206	207	208	210	212
3	306	309	312	315	318	321	325	331	337
4	412	418	425	431	437	444	451	464	478
5	520	531	542	553	564	575	587	611	635
6	631	647	663	680	698	715	734	772	812
7	743	766	790	814	839	865	892	949	1,009
8	858	889	921	955	990	1,026	1,064	1,144	1,230
9	975	1,016	1,058	1,103	1,149	1,198	1,249	1,358	1,478
10	1,095	1,146	1,201	1,258	1,318	1,382	1,449	1,594	1,755
11	1,217	1,281	1,349	1,421	1,497	1,578	1,665	1,853	2,065
12	1,341	1,419	1,503	1,592	1,687	1,789	1,898	2,138	2,413
13	1,468	1,562	1,663	1,771	1,888	2,014	2,150	2,452	2,803
14	1,597	1,709	1,829	1,960	2,102	2,255	2,421	2,797	3,239
15	1,729	1,860	2,002	2,158	2,328	2,513	2,715	3,177	3,728
20	2,430	2,687	2,978	3,307	3,679	4,100	4,576	5,727	7,205
25	3,203	3,646	4,165	4,773	5,486	6,325	7,311	9,835	13,333
30	4,057	4,758	5,608	6,644	7,906	9,446	11,328	16,449	24,133

Example:

The capital accruing after 10 years to the regular annual investment of £600 at 5% would be £1,258 x 6 = £7,548. At 6%, the capital accrued would be £1,318 x 6 = £7,908.

The terminal sum is given by:

$$d \times \left(\frac{(1 + r)^n - 1}{r} \right)$$

where: d = regular annual investment
 r = rate of interest (to 2 decimal places)
 n = years of repayment

Approximate Annual Percentage Rates of Annual Nominal Rates

As an aid to assessing finance deals, the following table estimates the equivalent annual percentage interest rates (APR's) for a range of nominal annual rates (e.g. 2% above base rate of 1% = 3%) and various charging regimes.

Annual nominal rate (%)	Approximate annual percentage rate equivalent (%)		
	Monthly charging	Quarterly charging	Half-yearly charging
2	2.0	2.0	2.0
3	3.0	3.0	3.0
4	4.1	4.1	4.0
5	5.1	5.1	5.1
6	6.2	6.1	6.1
7	7.2	7.2	7.1
8	8.3	8.2	8.2
9	9.4	9.3	9.2
10	10.5	10.4	10.3
11	11.6	11.5	11.3
12	12.7	12.6	12.4
13	13.8	13.6	13.4
14	14.9	14.8	14.5
15	16.1	15.9	15.6

Example:

A nominal interest rate of 5% with monthly charging gives an approximate annual percentage rate of 5.1%. A nominal rate of 6%, gives an annual percentage rate (APR) of 6.2%.

The approximate annual percentage rate is given by:

$$\left[\left(1 + \frac{n}{p} \right)^p - 1 \right] \times 100$$

where: n = nominal interest rate (expressed as a decimal)
p = number of instalments per year

Approximate Annual Percentage Rates of Annual Flat Rates

Where interest on finance is quoted as flat rate on the original amount borrowed, the following table can be used to estimate the equivalent annual percentage rate (APR) for equal monthly repayments of interest and capital.

Annual flat rate (%)	Approximate annual percentage rate equivalent (%) for loans over:			
	1 year	5 years	10 years	15 years
4	7.5	7.6	7.3	7.0
5	9.4	9.5	9.0	8.6
6	11.4	11.4	10.7	10.1
7	13.4	13.2	12.3	11.6
8	15.4	15.0	13.9	13.0
9	17.4	16.8	15.5	14.4
10	19.5	18.7	17.0	15.8
11	21.6	20.5	18.6	17.2
12	23.6	22.3	20.1	18.6

Example:

The APR for a loan at an annual flat rate of 6% repaid by monthly instalments over 5 years will be 11.4%.

Compounding Table

This table estimates the future monetary value of £100 after n years at various interest rates.

Years	Percentage rate of interest									
	3	4	5	6	7	8	10	12	14	16
1	103	104	105	106	107	108	110	112	114	116
2	106	108	110	112	114	117	121	125	130	135
3	109	112	116	119	123	126	133	140	148	156
4	113	117	122	126	131	136	146	157	169	181
5	116	122	128	134	140	147	161	176	193	210
6	119	127	134	142	150	159	177	197	219	244
7	123	132	141	150	161	171	195	221	250	283
8	127	137	148	159	172	185	214	248	285	328
9	130	142	155	169	184	200	236	277	325	380
10	134	148	163	179	197	216	259	311	371	441
11	138	154	171	190	210	233	285	348	423	512
12	143	160	180	201	225	252	314	390	482	594
13	147	167	189	213	241	272	345	436	549	689
14	151	173	198	226	258	294	380	489	626	799
15	156	180	208	240	276	317	418	547	714	927
20	181	219	265	321	387	466	673	965	1,374	1,946
25	209	267	339	429	543	685	1,083	1,700	2,646	4,087
30	243	324	432	574	761	1,006	1,745	2,996	5,095	8,585

Example:

The value of £1,200 at 5% after 8 years would be £148 x 12 = £1,776. At 6%, it would be £159 x 12 = £1,908.

The compounding factor is given by: $(1 + r)^n$

where: r = rate of interest (expressed as a decimal)
 n = number of years

Annuity Tables

Discount factors for calculating the present value of future cash flows where cash flows are **regular**.

Years	Percentage											
	1	2	3	4	5	6	7	8	9	10	11	12
1	0.99	0.98	0.97	0.96	0.95	0.94	0.94	0.93	0.92	0.91	0.90	0.89
2	1.97	1.94	1.91	1.89	1.86	1.83	1.81	1.78	1.76	1.74	1.71	1.69
3	2.94	2.88	2.83	2.78	2.72	2.67	2.62	2.58	2.53	2.49	2.44	2.40
4	3.90	3.81	3.72	3.63	3.55	3.47	3.39	3.31	3.24	3.17	3.10	3.04
5	4.85	4.71	4.58	4.45	4.33	4.21	4.10	3.99	3.89	3.79	3.70	3.61
6	5.80	5.60	5.42	5.24	5.08	4.92	4.77	4.62	4.49	4.36	4.23	4.11
7	6.73	6.47	6.23	6.00	5.79	5.58	5.39	5.21	5.03	4.87	4.71	4.56
8	7.65	7.33	7.02	6.73	6.46	6.21	5.97	5.75	5.53	5.34	5.15	4.97
9	8.57	8.16	7.79	7.44	7.11	6.80	6.52	6.25	6.00	5.76	5.54	5.33
10	9.47	8.98	8.53	8.11	7.72	7.36	7.02	6.71	6.42	6.15	5.89	5.65
11	10.37	9.79	9.25	8.76	8.31	7.89	7.50	7.14	6.81	6.50	6.21	5.94
12	11.26	10.58	9.95	9.36	8.86	8.38	7.94	7.54	7.16	6.81	6.49	6.19
13	12.13	11.35	10.64	9.99	9.39	8.85	8.36	7.90	7.49	7.10	6.75	6.42
14	13.00	12.11	11.30	10.56	9.90	9.30	8.75	8.24	7.79	7.37	6.98	6.63
15	13.87	12.85	11.94	11.12	10.38	9.71	9.11	8.56	8.06	7.61	7.19	6.81
20	18.05	16.35	14.88	13.59	12.46	11.47	10.59	9.82	9.13	8.51	7.96	7.47
25	22.02	19.52	17.41	15.62	14.09	12.78	11.65	10.67	9.82	9.08	8.42	7.84
30	25.81	22.40	19.60	17.29	15.37	13.76	12.41	11.26	10.27	9.43	8.69	8.06

Years	Percentage											
	13	14	15	16	17	18	19	20	25	30	35	40
1	0.89	0.88	0.87	0.86	0.85	0.85	0.84	0.83	0.80	0.77	0.74	0.71
2	1.67	1.65	1.63	1.61	1.59	1.57	1.55	1.53	1.44	1.36	1.29	1.22
3	2.36	2.32	2.28	2.25	2.21	2.17	2.14	2.11	1.95	1.82	1.70	1.59
4	2.97	2.91	2.86	2.80	2.74	2.69	2.64	2.59	2.36	2.17	2.00	1.85
5	3.52	3.43	3.35	3.27	3.20	3.13	3.06	2.99	2.69	2.44	2.22	2.04
6	4.00	3.89	3.78	3.68	3.59	3.50	3.41	3.33	2.95	2.64	2.39	2.17
7	4.42	4.29	4.16	4.04	3.92	3.81	3.71	3.60	3.16	2.80	2.51	2.26
8	4.80	4.64	4.49	4.34	4.21	4.08	3.95	3.84	3.33	2.92	2.60	2.33
9	5.13	4.95	4.77	4.61	4.45	4.30	4.16	4.03	3.46	3.02	2.67	2.38
10	5.43	5.22	5.02	4.83	4.66	4.49	4.34	4.19	3.57	3.09	2.72	2.41
11	5.69	5.45	5.23	5.03	4.84	4.66	4.49	4.33	3.66	3.15	2.75	2.44
12	5.92	5.66	5.42	5.20	4.99	4.79	4.61	4.44	3.73	3.19	2.78	2.46
13	6.12	5.84	5.58	5.34	5.12	4.91	4.71	4.53	3.78	3.22	2.80	2.47
14	6.30	6.00	5.72	5.47	5.23	5.01	4.80	4.61	3.82	3.25	2.81	2.48
15	6.46	6.14	5.85	5.58	5.32	5.09	4.88	4.68	3.86	3.27	2.83	2.48
20	7.02	6.62	6.26	5.93	5.63	5.35	5.10	4.87	3.95	3.32	2.85	2.50
25	7.33	6.87	6.46	6.10	5.77	5.47	5.20	4.95	3.98	3.33	2.86	2.50
30	7.50	7.00	6.57	6.18	5.83	5.52	5.23	4.98	4.00	3.33	2.86	2.50

Example:

The present value of £350 received each year for 6 years at 5% discount rate is £350 x 5.08 = £1,778. At 6%, the present value is £350 x 4.92 = £1,722.

The discount factor is given by:

$$\frac{1 - (1 + r)^n}{r} \quad \text{where: } r = \text{rate of discount}$$

$$n = \text{number of years}$$

Discount Tables

Discount factors for calculating the present value of future cash flows where cash flows are **irregular**.

Years	Percentage											
	1	2	3	4	5	6	7	8	9	10	11	12
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	0.901	0.893
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826	0.812	0.797
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751	0.731	0.712
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683	0.659	0.636
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621	0.593	0.567
6	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596	0.564	0.535	0.507
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513	0.482	0.452
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467	0.434	0.404
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424	0.391	0.361
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386	0.352	0.322
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350	0.317	0.287
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319	0.286	0.257
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290	0.258	0.229
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263	0.232	0.205
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239	0.209	0.183
20	0.820	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178	0.149	0.124	0.104
25	0.780	0.610	0.478	0.375	0.295	0.233	0.184	0.146	0.116	0.092	0.074	0.059

Years	Percentage											
	13	14	15	16	17	18	19	20	25	30	35	40
1	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833	0.800	0.769	0.741	0.714
2	0.783	0.769	0.756	0.743	0.731	0.718	0.706	0.694	0.640	0.592	0.549	0.510
3	0.693	0.675	0.658	0.641	0.624	0.609	0.593	0.579	0.512	0.455	0.406	0.364
4	0.613	0.592	0.572	0.552	0.534	0.516	0.499	0.482	0.410	0.350	0.301	0.260
5	0.543	0.519	0.497	0.476	0.456	0.437	0.419	0.402	0.328	0.269	0.223	0.186
6	0.480	0.456	0.432	0.410	0.390	0.370	0.352	0.335	0.262	0.207	0.165	0.133
7	0.425	0.400	0.376	0.354	0.333	0.314	0.296	0.279	0.210	0.159	0.122	0.095
8	0.376	0.351	0.327	0.305	0.285	0.266	0.249	0.233	0.168	0.123	0.091	0.068
9	0.333	0.308	0.284	0.263	0.243	0.225	0.209	0.194	0.134	0.094	0.067	0.048
10	0.295	0.270	0.247	0.227	0.208	0.191	0.176	0.162	0.107	0.073	0.050	0.035
11	0.261	0.237	0.215	0.195	0.178	0.162	0.148	0.135	0.086	0.056	0.037	0.025
12	0.231	0.208	0.187	0.168	0.152	0.137	0.124	0.112	0.069	0.043	0.027	0.018
13	0.204	0.182	0.163	0.145	0.130	0.116	0.104	0.093	0.055	0.033	0.020	0.013
14	0.181	0.160	0.141	0.125	0.111	0.099	0.088	0.078	0.044	0.025	0.015	0.009
15	0.160	0.140	0.123	0.108	0.095	0.084	0.074	0.065	0.035	0.020	0.011	0.006
20	0.087	0.073	0.061	0.051	0.043	0.037	0.031	0.026	0.012	0.005	0.002	0.001
25	0.047	0.038	0.030	0.024	0.020	0.016	0.013	0.010	0.004	0.001	0.001	0.000

Example: To find the present value of the following cash flows at 5% discount rate of interest.

Year	Cash flow (£)	Discount factor	Present value (£)	
1	250	0.952	238	The Present Value of this series of cash flows is £995
2	300	0.907	272	
3	180	0.864	155	
4	400	0.823	329	

The discount factor is given by

$$\frac{1}{(1 + r)^n}$$

where: r = rate of discount
 n = number of years

Long-Term Loans

Long-term finance might be obtained from banks, mortgage providers, insurance companies, finance companies, solicitors, or by private arrangement. These loans are generally secured against the value of existing property and other business assets.

Long-term loans tend to be used for purchasing fixed assets and are structured as an agricultural mortgage or secured loans typically extending between 5 and 25 years at fixed and/or variable interest. Interest payments can be arranged to tie in with cashflow but would usually be charged monthly or quarterly, however, there are alternative options e.g. of paying interest in half-yearly or annual instalments although this tends to be more expensive. Interest only periods are potentially available prior to moving to capital repayments. Frequency of capital repayments will be subject to negotiation with the lender. Capital repayments are generally packaged together with accrued interest in monthly payments. It may be agreeable with the lender to defer capital repayment or repay a lump sum on a fixed date each year.

It is necessary for the business borrowing the money to be deemed financially secure and demonstrate the ability to service the loan. This will be determined based on past financial performance, an updated balance sheet, cash flow budgets and perceived risk of the proposed venture.

Long-term loans can typically pass from generation to generation. In other words a loan is not repayable on the death of a borrower and cannot be recalled for the term of the loan provided that obligations continue to be met.

Medium-Term and Short-Term Credit

Banks

Banks, the primary source of medium and short-term capital, may agree to grant farmers an overdraft to meet business financial requirements.

Overdrafts are reviewed annually; the interest rate, subject to the security available, is competitive, and interest is charged daily only on the daily balance outstanding. Generally, an arrangement fee will be charged and, in some cases, a renewal fee.

In terms of medium term loans, 10-year term loans are most common. Interest is related to commercial and market factors but have historically been lower than overdraft rates (particularly if adjusted for any overdraft rearrangement fees).

Merchants and tradesmen

A popular form of short-term financing. Finance is often in the form of credit allowed by merchants, auctioneers, tradesmen and dealers over a

wide range of commodities and farm requisites, including livestock and implements. Rates of interest vary widely and can be relatively cheap over one or two months, but can rise to as high as 4% per month on accounts outstanding for several months.

Mart credit

Farmers buying livestock can obtain up to 12 months credit. Interest rates quoted vary depending on term and amount borrowed. Other arrangements are possible whereby a farmer may borrow capital from a mart for finishing stock purchased from the mart. Interest will be charged on the stock during the finishing period which is then deducted from the sale price achieved for the stock. The stock remains the property of the mart and must be resold through the mart or to an associated abattoir/meat processing company.

Hire purchase

Hire purchase is currently the most popular form of finance used by UK farmers. This type of finance covers identifiable products such as plant and machinery, and livestock. It offers 100% ownership at the end of the repayment period.

Credit is supplied by a finance company but the arrangements are often carried out through the dealer who made the sale. Repayment periods are usually from two to four years with payment by standing order. Payments are for capital and interest and are usually offered on a fixed rate basis. However, this form of finance can be more expensive than an overdraft, because the lender is offering less security.

Contract hire and leasing

Leasing is usually used for equipment or vehicles. Breeding livestock can also be leased. However, leasing costs can vary considerably and the details of a contract should be studied carefully before entering into an agreement. The tax aspects should be discussed with an accountant. Two types of leasing exist:

Finance Lease - Offers use of an asset for an agreed period without ownership. Payments are normally fixed for a defined period of time (usually 2 to 5 years). After this period, the farmer can either continue to use the equipment at a nominal rent (which can vary from nothing to 1.5% of capital cost), or, with the finance company's permission, sell the equipment. Dependent on arrangements, the farmer may obtain 90% to 100% of the sale value to be used as a refund or a down-payment.

Operating Lease - Appropriate for the use of equipment for less than its full economic life. The farmer takes the risk of the equipment becoming obsolete and is responsible for all repairs, maintenance and insurance. The residual value of the asset is usually set at the outset, based on the estimated use throughout the term. In most cases, this is more expensive than a finance lease.

The advantages of leasing schemes (machinery and livestock) depend on the individual's circumstances. Leasing is a complex subject and it is advisable to seek professional advice to assess the best financial alternative.

Taxation

Introduction

This section is designed to provide background information on how tax may affect the farm business and contains a summary of how the system operates. Tax is an increasingly complex subject and there are thirteen tax rates that could apply to income and capital gains of a Scottish Taxpayer.

The tax year which started on 6 April 2018 was the first year in which the Scottish Government's devolved powers were used to any significant impact. Before then, despite some tinkering with rate bands, the Scottish Rate of Income Tax (SRIT) had been kept the same as the rest of the UK (RUK). Now we have five specific rates/bands imposed by the Scottish Government and the table shown on page 540 illustrates the complexities involved.

Although every effort has been made to provide accurate details, no responsibility can be taken for any omissions that may have occurred in the treatment of this specialised field.

The Taxation section of the Handbook has been updated by CT (formerly Chiene + Tait LLP). CT is an independent accountancy firm which offers an extensive range of personal, business and advisory services to a wide range of clients and has a significant agricultural practice. If you would like to discuss the range of services provided by CT please contact their offices on 0131 558 5800 (Edinburgh), 0141 488 1200 (Glasgow) or 01463 575400 (Inverness) to speak to a member of the agricultural group or email agriculturalgroup@ct.me.

Tax Headlines for the 2024/25 Year

It has been another eventful year in UK politics and, as such, there have been several key changes to tax legislation announced by both the UK and Scottish governments which came into effect on the 6 April 2024. We have highlighted some of these below:

Income Tax:

- For Scottish taxpayers, the government have introduced a new Advanced Rate tax band. As a result, any income falling within the £75,000-£125,140 threshold will be taxed at 45%. Also, the additional rate band has been increased by 1% to 48%.
- As of 6 April 2024, the UK government abolished Class 2 National Insurance Contributions (NICs) for self-employed individuals with profits exceeding £12,570. These individuals will still receive an NI credit towards their state pension and preserve their entitlement to other state benefits.
- The dividend allowance has been reduced from £1,000 to £500.

Pensions:

- The Annual Allowance for pension contributions remains at £60,000.
- The Lifetime Limit for pensions was abolished on 6 April 2024 and has been replaced by new allowances; the lump sum allowance of £268,275 and the lump sum and death benefit allowance of £1,073,000.

Capital Gains Tax:

- The annual exemption has reduced from £6,000 to £3,000 for individuals and from £3,000 to £1,500 for most trustees.
- The higher rate of CGT applicable to residential properties has been reduced from 28% to 24%.

VAT:

- The VAT registration and deregistration thresholds increased with effect from 1 April 2024 to £90,000 and £88,000 respectively.

Corporation Tax:

- The main rate of corporation tax increased from 19% to 25% with effect from 1 April 2023 for companies with taxable profits above £250,000.
- In addition, a small profits rate (SPR) was introduced for companies with taxable profits below £50,000. Companies falling within this rate will continue to pay corporation tax at 19%.
- Companies with taxable profits between £50,000 and £250,000 will pay tax at a marginal rate between 19% and 25%.
- The limits of £250,000 and £50,000 are reduced if there are any associated companies (broadly companies under common control).

Income Tax

Income tax is calculated by applying the appropriate rates to taxable income. The amount of a person's income chargeable to tax in any year is calculated according to the specific rules applicable to the various types of income. Farming profits are assessed as trading income.

The net profit in the accounts usually requires an adjustment because some costs may appear in the accounts which are not allowable for tax purposes (e.g. depreciation) and some income may not be subject to income tax at all, or not taxed as trading income.

All taxpayers are entitled to £1,000 allowances for both property income and trading income. This means that the first £1,000 gross of most sources of property income and/or trading income is exempt from income tax. If gross income exceeds £1,000, then the taxpayer can either deduct the £1,000 allowance or deduct allowable expenses.

Main Income Tax reliefs

Allowed at top rate of tax	2024/25	2023/24
Personal Allowance ¹	£12,570	£12,570
Blind Person's Allowance	£3,070	£2,870
Marriage Allowance ²	£1,260	£1,260
Dividend Allowance (DA) ³	£500	£1,000
Personal Savings Allowance (PSA) ⁴		
- Basic Rate Taxpayer	£1,000	£1,000
- Higher Rate Taxpayer	£500	£500

Allowed only at 10%		
Married Couple's Allowance (MCA) ⁵	£11,080	£10,375
Income limit for age-related allowances	£37,000	£34,600

- ¹ The personal allowance is withdrawn at £1 for every £2 by which total income exceeds £100,000 such that allowances become nil at income of £125,140.
- ² Up to 10% of the personal allowance can be transferred to a spouse who is no more than a basic rate taxpayer. Not available if the married couple's allowance is being claimed.
- ³ The DA taxes the first £500 of dividend income at 0%.
- ⁴ The PSA operates as a nil rate band for interest income.
- ⁵ Only available if born before 6th April 1935.

UK Income Tax bands and rates

	2024/25	2023/24
Basic rate band	£37,700	£37,700
Higher rate band	£37,701 - £125,140	£37,701 - £125,140
Additional rate band	over £125,140	over £125,140

The tax rates differ for Non-Savings income (NS - salary, pensions, business profits, rent), Savings income (S - interest) and Dividend income (D).

	2024/25			2023/24		
	NS	S	D	NS	S	D
Basic rate	20%	20%	8.75%	20%	20%	8.75%
Higher rate	40%	40%	33.75%	40%	40%	33.75%
Additional rate	45%	45%	39.35%	45%	45%	39.35%

Reduction to the Dividend Allowance

As of 6 April 2024, the Dividend Allowance was reduced from £1,000 to £500. As a result, only the first £500 of dividends received during the 2024/25 year will be taxed at 0% with any residual dividends taxed at the above rates. No further reductions to the Dividend Allowance have been announced however, this may change following the change in government.

Scottish Rate of Income Tax (SRIT)

Since April 2017, the Scottish Parliament has had the authority to vary the rate bands as well as the actual tax rates. The SRIT will apply to Non-Savings Income belonging to a 'Scottish Taxpayer' regardless of where that income arises. The rules for defining a 'Scottish Taxpayer' can be complicated but will broadly apply where the individual's main family home is in Scotland.

From 2017/18 onwards, a Scottish Taxpayer who receives Non-Savings Income (salary, pensions, business profits, rents) as well as Savings income and Dividend income will need to consider both the UK tax rates and tax bands and the Scottish tax rates and tax bands in order to work out their income tax liability.

With effect from 6 April 2024, the Scottish Government have created a new Advance Rate of tax. This band taxes any non-savings income falling within £75,001 to £125,140 at 45%. Any income received in excess of this band will be taxed at the Additional Rate which was increased by 1% to 48% as of 6 April 2024.

For 2024/25, the Scottish rates of income tax and tax bands are as follows:

	Tax Band	2024/25
Starter rate	£12,571 - £14,876	19%
Basic rate	£14,877 - £26,561	20%
Intermediate rate	£26,562 - £43,662	21%
Higher rate	£43,663 - £75,000	42%
Advance rate (new)	£75,001 - £125,140	45%
Additional rate	Over £125,140	48%

Important investment annual limits

	2024/25	2023/24
Individual Savings Account (ISA)	£20,000	£20,000
Junior ISA ¹	£9,000	£9,000
Enterprise Investment Scheme (EIS) ²	£2,000,000	£2,000,000
Venture Capital Trust (VCT) ²	£200,000	£200,000
Seed Enterprise Investment Scheme (SEIS) ³	£200,000	£200,000

¹ Available from 20 November 2011 to all UK resident children who do not have a Child Trust Fund account. From 6 April 2015 it has been possible to transfer a Child Trust Fund to a Junior ISA.

² Income Tax relief at 30% for both EIS and VCT

³ Income Tax relief at 50% for SEIS

Full details of the rates of income tax and the main allowances can be found on the HM Revenue and Customs (HMRC) website at www.gov.uk.

Property Rental Income

Since 6 April 2017 tax relief on finance costs for rental businesses with residential property has been restricted. Until 5 April 2017, any finance costs incurred annually were offset against rental income when calculating taxable profits. For the 2020/21 tax year onwards, taxpayers can only treat finance costs as a tax reducer at the basic rate of tax.

Tax Credits

The system of tax credits is a method by which financial support is given to those in work, or with children, on low incomes. Tax credits comprise working tax credits and child tax credits. The term tax credit is a misnomer: tax credits are a form of financial support, and they are administered by HMRC. The financial support (itself tax-free) consists of payments to claimants, and not offsets against tax liabilities. The income tax system treats members of a family independently. By contrast, tax credits are based, where appropriate, on the circumstances of couples living together, whether married or not. Tax credits are being replaced by the Universal Credit on 5 April 2025.

Further information on tax credits can be found on the tax credit website at www.gov.uk.

Pensions

It is recognised that state pensions do not provide an adequate income in old age and it is for this reason that individuals may wish to contribute to pensions other than under the state pension scheme. Pension contributions attract tax relief up to set limits and the contributions are accumulated in a fund that is free of income tax and capital gains tax.

The rules for tax relief on pension contributions have undergone significant changes over the years with a view to simplification. Complications remain with rules for the carry forward of unused relief and advice should be taken on the tax implications before a pension contribution is made. Broadly, however, anyone can contribute up to £3,600 (gross) each year, regardless of earnings. Pension payments are made net of basic rate tax relief so the individual would pay £2,880 and the government would add £720 to the pension fund to bring the total up to the £3,600 figure. Higher rate tax relief if applicable is then given through the individual's self-assessment tax return or PAYE code. For 2024/25, the maximum tax-efficient contribution will generally be £60,000 (gross) or 100% of current earnings unless there is unused pension relief available to carry forward from the previous tax years. With effect from 6 April 2020 the maximum contribution is tapered where 'adjusted income' (i.e. including pension contributions) is more than £260,000. The

reduction is £1 for every £2 of income over £260,000 and the minimum allowance will be £10,000.

There is also a lifetime limit to the value an individual can contribute to a pension fund tax efficiently. As of 6 April 2024, the Lifetime Allowance was abolished and replaced with two new pension allowances; the lump sum allowance of £268,275 and the lump sum and death benefit allowance of £1,073,100. It is therefore still possible to incur a tax charge where these limits are breached. Please speak to a pensions advisor if you believe that these changes may affect you.

Occupational schemes are available to employees who have an employer offering such a scheme and the Pensions Act 2008 included provisions requiring employers to set up pension arrangements for all employees. The rules for compulsory work pensions include a government “auto-enrolment” scheme called the National Employment Savings Trust (NEST). There are now alternative private pension providers offering auto-enrolment scheme options in addition to the government NEST scheme. The implementation date for compulsory pensions is phased according to the number of employees. Staging dates started in the final quarter of 2012 for the largest employers and all existing employers should now be complying.

From 6 April 2015, those with a money purchase pension (i.e. not final salary schemes) will be able to have unrestricted access to the full value of their pension fund. Any withdrawals above the level of the tax-free amount (currently 25%) will be taxed at the individual’s marginal rate of income tax. To prevent recycling funds into another pension to increase the tax relief available, a Money Purchase Annual Allowance (MPAA) was introduced. Until 5 April 2017 the MPAA was £10,000, however, with effect from 6 April 2017 it has been £4,000.

Recent tax changes have resulted in pensions becoming increasingly beneficial for inheritance tax planning matters.

Capital Allowances

<i>Main capital allowances - plant and machinery</i>	<i>Allowance %</i>
Annual Investment allowance: £1,000,000 (from 1 Jan 2019)	100
Full expensing capital allowances (only available to companies)	100
Electric cars, cars with zero emissions and equipment for electric charging points	100
Writing down allowance: general pool	18
Writing down allowance: special rate pool*	6

* The special rate pool includes long life assets, integral plant in buildings, thermal insulation, solar shading and cars with CO₂ emissions over 50g/km.

In the accounts it is normal practice to write-off part of the cost of plant, machinery, vehicles and buildings as depreciation each year. In calculating taxable income, this depreciation is added back to profit, and capital allowances are deducted.

Since 6 April 2008, it has been possible to claim the 100% Annual Investment Allowance (AIA) for plant and machinery (excluding cars). On 1 January 2019, the AIA increased to £1,000,000 and is currently still held at this level. The AIA is available to partnerships made up of individuals, but it is not available to 'mixed partnerships', i.e. partnerships that include a company or a trust.

Since 1 April 2023 companies have been able to claim full expensing capital allowances. These new rules give a 100% first year deduction on qualifying main pool expenditure and a 50% first year allowance for qualifying special rate pool expenditure. The assets must be new and unused, and cars are excluded. When the asset is later disposed of there is a clawback whereby the proceeds are taxed in that period.

Capital allowances for new cars are related to the CO₂ rating of the car. New electric cars or cars with zero emissions enjoy a 100% first year allowance. Cars with a rating up to 50g/km will go into the general pool and receive 18% allowances. Cars with higher ratings will go into the special rate pool and only receive 6% allowances.

Expenditure on integral features of a building such as electrical and lighting systems, cold water and water heating systems and expenditure on solar panels qualifies for special rate allowances at 6%.

A 'Structures and Building Allowance' ('SBA') is available at a rate of 3% per annum on a straight-line basis for qualifying expenditure on the construction of qualifying commercial property. Qualifying properties can include agricultural buildings, as well as other non-residential properties such as offices.

Farmers should review their expenditure on buildings to ensure that any expenditure which may qualify for plant and machinery, or integral features allowances are identified. It is also important to review the timing of capital expenditure to maximise allowances.

Losses

When an individual makes a trading loss for a tax year, the loss can be relieved against any other income of the same tax year, against any other income of the previous tax year, against capital gains of either year or by carry forward against future trading profits from the same trade. There are also special loss relief rules for losses made in the early years of a business and the last twelve months before the cessation of trade.

However, from 6 April 2013, the amount of *income tax* loss relief available to an individual in a tax year in respect of a trade loss is capped at the greater of £50,000 or 25% of income.

In addition, the amount of loss relief that a sole trader or partner may claim against general income has been limited to £25,000 if the loss is from *non-active trades*. An individual is deemed to be non-active if they spend an average of less than 10 hours per week personally engaged in the trade's activities. The existing rules for restricting tax relief for losses incurred for more than five consecutive tax years under the "hobby farming" provisions also still apply.

For companies, subject to the "hobby farming" rules above, trading losses can generally be:

- Offset against other profits in that period;
- Carried back against profits of the previous year;
- Offset against other profits in the same group; OR
- Carried forward indefinitely for offset against future taxable profits, provided that the same trade is still being carried on.

Relief for Fluctuating Profits (Farmers Averaging)

Relief for fluctuating profits (also known as Farmers Averaging) is available to any individual or partnership carrying on a trade of farming or market gardening. Prior to April 2016, it was possible to average two consecutive years of assessment where the profits of one year are at least 30% below the profits of the other. From April 2016, it has been possible to choose to average over a five-year period.

Averaging claims can result in significant savings of tax and national insurance contributions. Averaging is a valuable relief for farmers, particularly now that income tax rates can be as high as 48%.

Herd Basis of Livestock Valuation

Under the herd basis of livestock valuation, fluctuations in the value of production animals are not taken into account in computing profits, nor is the cost of the original herd or flock deductible. The values of the original production stock numbers are held constant throughout the period that the herd is in existence.

An election to adopt the herd basis of livestock valuation can normally only be made at a time when a production herd is first kept and provided that a herd of that class has not been kept in the preceding five years. Once made, an election is irrevocable and will come to an end only on ceasing to keep a production herd of the particular class for a period of five years or on a change of business structure, e.g. when a sole trader introduces a partner to the business. The time limit for making an

election to adopt the herd basis of valuation is two years after the end of the first tax year affected by the purchase of the herd.

The advantage of the herd basis is the exclusion from taxable profit of changes in value of production animals. In addition, when a whole herd or a substantial part of it (over 20%) is sold without replacement, any difference between sale value and book value is not taxable for income tax or capital gains tax purposes.

Basis Period Reform

Changes have recently been announced which will affect the taxation of unincorporated business profits (i.e. sole traders and partnerships) that do not have a 31 March or 5 April accounting year end.

Under the current rules, business profits are assessed according to defined “basis periods”. Broadly, a business’ basis period will match its account period, with the profits from the accounting period ending in the tax year being those subject to income tax. More complex rules applied to businesses that were in the early or final years of trading.

In 2022, the UK Government announced that the concept of “Basis Periods” would be abolished and, instead, replaced by the “Tax Year Basis” with effect from April 2024. The new rules ensure that profits and losses are apportioned to tax years where a business does not have a 31 March or 5 April year end. Therefore, all businesses will be taxed on profits arising in the tax year from 2024/25 onwards. To assist with the changes, Transitional Rules were introduced for the 2023/24 year.

Where a trader or business has transitional profits for the 2023/24 year, the rules will spread these profits over a maximum period of five tax years. However, the trader may elect to spread these profits over a shorter period, if preferable.

Where transitional profits take a taxpayer’s adjusted net income over the £100,000 threshold, the taxpayer’s personal allowance will be restricted. However, transitional profits are not taken into consideration when assessing whether the £50,000 threshold for Child Benefit has been breached or the tapering threshold for the pension Annual Allowance.

With the changes coming into effect, affected sole traders and unincorporated businesses should ensure that they have good forecasts for expected cashflow and likely profits/losses for the coming years. It may also be beneficial to consider aligning their accounting period with the tax year to minimise the administrative burden going forward.

If you require any advice or guidance regarding the Basis Period Reform, please speak to an advisor.

Self-Assessment Procedures

Every personal tax return carries a self-assessment section in which the taxpayer is normally expected to calculate his or her own income tax and capital gains tax liability. The submission deadline for paper tax returns is 31 October following the end of the tax year. The submission deadline for tax returns delivered electronically is 31 January following the end of the tax year. Penalties are imposed for the late submissions of tax returns.

Tax liabilities are settled via two interim payments on account and a final balancing payment. The two interim payments on account are payable on 31 January during the tax year and 31 July following the end of the tax year. The balance of any income tax due and the full amount of any capital gains tax due is payable on 31 January following the end of the tax year. Interest and surcharges will be due on tax paid late.

Records of personal income, such as bank interest and dividend income should be retained for a period of one year and ten months following the year of assessment to which they relate unless the taxpayer also has a business or let property in which case all records must be kept for five years and ten months.

Corporation Tax Procedures

Companies have 12 months from the end of the accounting period to file their tax return. For most companies, tax payments are due nine months and 1 day after the end of the accounting period and large companies pay tax in instalments.

Corporation Tax Rates

Year to 31 March 2025

Main rate	25%
Small profits rate	19%

As of 1 April 2023, the Corporation Tax main rate for non-ring-fenced profits was increased to 25% applying to profits over £250,000. A small profits rate (SPR) was introduced for companies with profits of £50,000 or less so that they will continue to pay Corporation Tax at 19%. Companies with profits between £50,000 and £250,000 will pay tax at the main rate reduced by a marginal relief providing a gradual increase in the effective Corporation Tax rate. Please note that these limits of £250,000 and £50,000 are reduced if there are any associated companies (broadly companies under common control).

If the farm trade is carried on through the medium of a company, corporation tax on the profits must be paid by the company. Corporation

tax is charged on the trading profits, capital gains and other income of an accounting period. Directors' salaries and fees are a charge against profit. Capital allowances are deducted where expenditure is incurred on the acquisition of qualifying plant and machinery.

Annual Tax on Enveloped Dwellings (ATED)

From 1 April 2013 an annual tax charge has been imposed on certain 'non-natural persons' (broadly, companies, partnerships with a corporate partner and collective investment schemes) which hold UK residential dwellings. From 1 April 2016 properties valued at more than £500,000 on specific valuation dates are subject to the charge. For 2024/25, the charge is determined as follows:

Property Value	Annual Tax Charge
£500,000 - £1,000,000	£4,400
£1,000,001 - £2,000,000	£9,000
£2,000,001 - £5,000,000	£30,550
£5,000,001 - £10,000,000	£71,500
£10,000,001 - £20,000,000	£143,550
More than £20,000,000	£287,500

A capital gains tax charge may also arise on disposal, regardless of whether the company is resident in the UK or overseas. A 15% SDLT or LBTT charge may arise on the acquisition of such properties.

A new valuation was required on 1 April 2022 for 2023/24 ATED returns, which then applies to ATED returns for the next five chargeable periods to 2027/2028. Residential properties owned by non-natural persons must be revalued every 5 years. The next valuation date is now 1 April 2027, applying to ATED returns from 2028/2029.

For existing properties, ATED returns are due to be submitted and the tax paid by 30 April during the first month of the ATED tax year (ATED years run from 1 April to 31 March). The next ATED returns for 2025/2026 are due to be submitted by 30 April 2025.

If a property is purchased part-way through the ATED year, then the deadline for submission of the return and payment of tax is only 30 days from date of purchase.

Capital Gains Tax

The annual exempt amount for 2023/24 for individuals has been reduced from £12,300 to £6,000, and, for most trustees, the exempt amount is reduced from £6,150 to £3,000. The Capital Gains Tax (CGT) rates for 2023/24 are 10% (for the element within the basic rate band) and 20% for gains falling with the higher and additional rate bands. As of 6 April 2024,

the higher rate of CGT for residential properties was reduced from 28% to 24%. The basic rate for residential properties remains at 18%.

CGT is a tax on the increase in value of certain property which is sold or given away in a lifetime. It applies to the sale or gift of assets such as land, shares, or other capital assets. CGT does not apply to transfers of cash or the disposal of trading stock. Lifetime gifts between spouses do not give rise to a chargeable gain.

Capital losses are set against other capital gains of the same year or carried forward to reduce gains in excess of the annual exemption in future years. Capital losses cannot be carried back unless they arise in the year of death.

From 1 April 2013, CGT was payable at 28% in respect of any gain arising from the disposal of residential property owned by UK resident or non-UK resident “non-natural persons”. As of 6 April 2024, this rate has been reduced to 24%.

From 6 April 2015, CGT is payable on the disposal of UK residential property by non-resident individuals. On sale, there are two options. The property value can be rebased at 5 April 2015 and the chargeable gain arising on disposal will be the difference between the 5 April 2015 valuation and the value at date of sale. Alternatively, the gain arising over the whole period of ownership can be calculated and apportioned, with only the element of the gain arising after 6 April 2015 being liable to CGT.

From 6 April 2019, CGT is payable on the disposal of all UK residential and non-residential property (i.e. commercial property) by non-resident individuals. In determining the CGT position, it is possible to rebase the property to reflect its value at 6 April 2019.

From 6 April 2020, there is a new reporting and payment requirement for a UK resident individual who disposes of a residential property and the disposal gives rise to a charge to CGT, i.e. the gain is not covered by a relief (such as main residence relief), losses or the annual exemption. The individual is required to make a return in respect of the disposal to HM Revenue & Customs within 60 days, and at the same time make a payment on account of capital gains tax.

Business Asset Disposal Relief was known as Entrepreneurs’ Relief before 6 April 2020.

Business Asset Disposal Relief applies to disposals of a sole trade or interest in a partnership trade or shares in a trading company where the shareholder owns at least 5% of the ordinary share capital **and** has at least 5% of the voting rights **and** is entitled to 5% of the profits on winding up and is an officer or employee of the company. There is a requirement to meet the qualifying criteria for a minimum period of 24 months

(previously the minimum ownership period was 12 months). Qualifying gains are taxed at 10% up to a lifetime maximum of £1m.

Principal Private Residence Relief (PPR) will generally exempt the gain arising on the sale of the farmhouse and up to half a hectare of grounds. The relief will be restricted if any part of the residence is used solely for business purposes. Where a property had been occupied as the owner's only or main residence, the last 9 months of ownership will qualify for PPR even if the property was no longer occupied.

Gift Relief is available on the gift of assets used in a trade carried on by the transferor, agricultural property (including tenanted land) or shares in an unquoted company. The capital gain is calculated as normal but does not become chargeable if both the transferor and the transferee agree to "hold over" the gain. If an election is made, the transferee will be deemed to acquire the asset at its open market value less the gain held over. In this way the tax charge is deferred until the transferee sells the asset at arm's length. Gift relief is restricted if there has been any non-business use of the asset.

Roll Over Relief can be claimed when a capital asset which has been used for trade purposes (e.g. a building) is sold at a gain and the whole of the sales proceeds are invested in other qualifying assets to be used for trade purposes. The value of the new asset is deemed to be reduced by the amount of the gain arising on the sale of the first asset. The sale proceeds must be reinvested in the period commencing twelve months before and three years after the sale of the original asset. If the entire proceeds of the sale are not reinvested, only partial roll-over relief is available.

Inheritance Tax

Nil Rate Band (NRB)	£325,000
Rate above NRB	40% ¹
Lifetime transfers to certain trusts	20%
Annual exemption for lifetime gifts	£3,000
Small gifts - annual amount per donee	£250

¹ There is a reduced rate of 36% for an estate leaving 10% or more to charity on or after 6 April 2012

Tapering relief applies to reduce the tax on transfers within 7 years of death. The reduction in tax is 20% for survivorship of 3-4 years, 40% for 4-5, 60% for 5-6 and 80% for 6-7 years.

It should be noted that it is now possible for a nil rate band which is unused on a person's death to be transferred to the estate of their spouse or civil partner. Chargeable transfers at death are subject to IHT, but there is no IHT charged on lifetime gifts to individuals. Such transfers are

known as potentially exempt transfers (PETs). Where the donor dies within seven years of making a PET, the transfer is taxed on its value at the date of the gift, using the death rate scale applicable at the date of death.

An additional tax-free band worth £175,000 per individual (£350,000 per married couple) applies from April 2020 in respect of the transfer of an individual's main home on death. The £350,000 allowance applies where the property is passed between spouses on first death and then on to children or grandchildren.

The combination of this new allowance and the existing IHT Nil Rate Band of £325,000 per individual means that a married couple now has a combined NRB of £1 million. However, this new allowance is only available in full where the value of the deceased estate is under £2 million. In deceased estates with a value of over £2 million, the allowance is reduced by £1 for every £2 over £2 million. This means that deceased estates with a value of more than £2.35 million will not benefit from the allowance.

Several transfers are left out of account in arriving at the cumulative total on which a person is chargeable. These include transfers between spouses, lifetime transfers made in a year up to a value of £3,000 and transfers to charities.

Wide ranging changes to IHT were announced in 2006 which have had a significant impact on UK estate planning using trusts. As a result of the scope and complexity of these trust rules it is not possible to consider the detail here. Farmers would be advised to consult their tax advisers to review the terms of existing trusts and their wills.

Agricultural and business property relief can in some circumstances reduce the value of the chargeable transfer to Nil.

Agricultural Property Relief (APR)

<i>Nature of property</i>	<i>Rate of Relief</i>
Vacant possession or right to obtain vacant possession within 12 months	100%
Agricultural land let after 1 September 1995	100%
Any other circumstances *	50%

* The 100% relief can apply in certain circumstances where land has been owned and let since before 10 March 1981 and by Extra Statutory Concession F17.

Agricultural Property Relief (APR) only applies to the agricultural value of farmland. Where the farm has additional development value this may qualify for Business Property Relief (BPR).

Agricultural property includes “such cottages, farm buildings and farmhouses, together with the land occupied with them, as are of a character appropriate to the property”. To qualify for APR, the transferor must either have farmed the agricultural property for two years before the transfer or have owned it for seven years before the transfer, during the whole of which time it has been occupied for the purposes of agriculture.

In order to obtain APR for a farmhouse it is necessary to show that the farmhouse is of a character and size appropriate to the property and the requirements of the farming activities conducted on the agricultural land. Relief may therefore be denied where the farmhouse is excessively large in relation to the farm. The definition of farmhouses and other agricultural property has been considered in a number of cases. HMRC will review APR claims more or less as a matter of course and specialist advice may be needed now, i.e. on a proactive basis, or in the event of an HMRC challenge.

Business Property Relief (BPR)

<i>Nature of property</i>	<i>Rate of Relief</i>
Business or interest in a business	100%
Controlling shareholding in quoted company	50%
Shareholding in unquoted company	100%
Controlling holding in unquoted securities	100%
Settled property used in the business of a life tenant	100%/50%*
Land, buildings, plant used in company or partnership	50%

* 100% relief is available where the property is transferred with the business on death otherwise the 50% rate applies.

BPR is a relief against IHT on business assets, including a tenant’s capital items such as machinery and livestock. To qualify for BPR, the property should have been owned by the claimant for two years before the transfer (or it must have replaced other qualifying assets owned for at least two out of the five years before the transfer). BPR is not available if the business or company is one of “wholly or mainly” dealing in securities, stocks or shares, land or buildings or in the making or holding of investments. Some business activities are borderline and particular care will be needed for mixed estates comprising farming and letting activities.

Value Added Tax

Value added tax (VAT) is an indirect tax on sales of goods and services. In general, a taxable business pays VAT on its purchases (input tax) and charges VAT on its sales (output tax). Taxable businesses are required to pass on the output tax to HMRC and may reclaim input tax. From 1 April 2024 until 31 March 2025, businesses with an annual turnover of taxable goods and services of more than £90,000 are required to register for VAT. Businesses with a turnover of less than £88,000 may elect to

deregister. It is also possible to voluntarily register for VAT where turnover is below £90,000 if this is seen to be beneficial. Once registered VAT returns are normally submitted to HMRC quarterly (although it is possible to apply for monthly VAT returns subject to certain conditions - see below).

Standard rate (1/6 of VAT-inclusive price)	20.0%
Registration level from 1 April 2024	£90,000 per annum
Deregistration level from 1 April 2024	£88,000 per annum

There are three rates of VAT applicable to taxable income: a standard rate, a reduced rate of 5% and a 0% rate. The standard rate is currently 20% and has been at this level since 4 January 2011.

Some income streams are not taxable, and are exempt from VAT. This can include supplies made in connection with land, i.e. renting or selling land or property. It is possible to 'opt to tax' land or property so that you can make the lease, licence or sale taxable. This is beneficial if there is input VAT to claim on expenditure connected with the property. The option to tax does not apply to residential accommodation.

Since farm businesses often have zero rated taxable income they can often be in a position where VAT being reclaimed from HMRC exceeds output VAT paid. In such situations, it is advisable to apply to HMRC to submit monthly rather than quarterly returns to aid cashflow. This can be done online.

Farmers may deregister for VAT and elect to use the "flat rate" farmers' scheme. A "flat rate" farmer cannot reclaim VAT on inputs, but charges and retains a flat rate addition of 4% on designated farming activities. This applies even if some of the goods would otherwise be zero rated. If the farmer is involved in other non-farming activities (e.g. bed and breakfast) which have a turnover above the VAT threshold, the flat rate scheme may not be available.

The following is a brief summary of the VAT rates as they apply to typical farming activities and expenditure.

VAT - exempt Items

- Banking
- Certain subscriptions
- Cottage rents other than for holiday purposes
- Granting of credit and loans
- Instalment credit finance charges on a hire-purchase
- Insurances
- Land let for growing grain, etc*
- Postal services
- Purchase or sale of land and existing buildings*
- Rent*
- Easements, Wayleaves, Servitudes, Rights of Way*

* The grant of a lease, licence or sale of land and property is exempt from VAT. Therefore, the above activities marked with a * are exempt from VAT unless an option to tax is in place. If an option to tax is in place these supplies are standard rated.

VAT - standard rated goods and services

Accountants' fees
Artificial insemination
Binder twine
Business activities of a Government Department
Camping facilities and car parks
Charges for storage of goods in enclosed spaces
Commission
Consultants' fees
Contract work for which a payment is in cash or kind
Cottage rents if let as holiday accommodation
Domestic fuel (special rate of 5% - provided supplied for "qualifying use")
Farmyard manure
Fencing and drainage
Fertilisers
Fishing and shooting rights
Fuel - petrol, diesel, and other heavy oil (for road use)
Grazing wintering and land let (with care of animals)
Haulage
Hire of machine or implements
Horses and ponies
Leasing charges
Machinery and vehicle repairs
MLC recording fees
New or second-hand machinery
Non-edible horticultural products
Non-residential construction
Property repairs
Quota sales and leases
Room lettings where catering is included
Sheep dogs
Soil and silage sampling charges
Sprays
Subscriptions, if association VAT registered
Telephone accounts
Tourist accommodation and meals
Trees and hedgerow timber
Paint
Pet foods
Veterinary services and medicines
Wood
Wool

VAT - zero rated goods and services

Animal feeding stuffs

Bees

Crops

Energy Saving Materials installed in residential properties (from 1 April 2022 to 31 March 2027)

Eggs

Sale of new residential buildings

Construction services in relation to a new dwelling

Grazing and wintering (no service included)

Livestock but excluding working animals

Milk

Newspapers, books and periodicals (including online since 1 May 2020)

Seeds of food and seed plants

Trees and bushes if used for production of edible fruit

Outside the scope of VAT

Grants

Compensation

Insurance Claims

Dilapidation payments

Car fuel scale charges

Other than farm vehicles, where fuel is purchased for vehicles which are used for private and business purposes, VAT is only partially recoverable. To make things simpler businesses can use the VAT Fuel Scale Charge. When using this system the business reclaims all VAT incurred on fuel and then accounts for the private use using the fuel scale charge. Alternatively, the business can elect to not recover any VAT incurred on fuel.

The VAT road fuel scale charges are based on the emissions rating of the vehicle and were updated with effect from 1 May 2024. These figures should be used only from the start of the next VAT accounting period beginning on or after that date. These figures along with previous years can be found on the HMRC website at <https://www.gov.uk/guidance/vat-road-fuel-scale-charges-from-1-may-2024-to-30-april-2025>

Basic Payment Scheme Entitlements

The receipt of BPS from the Scottish Government is outside the scope of VAT.

The sale or lease of BPS entitlements by a VAT registered business is treated as a supply. This means that the purchase price would be subject to VAT at the standard rate and farmers would be looking to recover this input VAT.

Brexit

The UK's transition period with the European Union came to an end on 31 December 2020 and therefore new rules came into force from 1 January 2021 for trading with suppliers and customers based in the EU.

Businesses that trade with EU suppliers and customers should consider their position following the exit from the EU to make sure the correct treatment is followed.

Energy Saving Materials

A new zero rating was introduced from 1 April 2022 for the supply and installation of energy saving materials into residential property including solar panels, heat pumps and roof insulation. The zero-rate will be available for five years and will revert to the 5% reduced VAT rate from 1 April 2027.

New Penalty Regime for VAT

The new penalty regime for VAT defaults came into effect for taxpayers from **1 January 2023**. This replaced the previous default surcharge regime for late submission and payments of VAT.

Late submissions: The new regime for late submissions of VAT returns introduced a points-based penalty system where taxpayers will not receive an automatic financial penalty until they have acquired the necessary number of 'points'. The points issued will be proportionate and the aim is to penalise the small minority of taxpayers who persistently miss submission obligations rather than those who make occasional mistakes.

Taxpayers will receive a point each time a submission deadline is missed with HMRC. A notification of each point acquired will be sent out to the taxpayer by HMRC. Once the taxpayer has received a certain number of points, a financial penalty of £200 will be charged to the taxpayer. The points threshold is determined by how often the taxpayer makes submissions to HMRC. The taxpayer will also be placed into a period of compliance during which all submission obligations are to be met within the period. This is summarised as follows:

Submission Frequency	Penalty threshold	Period of Compliance
Annual	2 points	24 months
Quarterly	4 points	12 months
Monthly	5 points	6 months

Late Payments: The new late payment penalty consists of two separate charges. The first charge becomes payable 30 days after the payment due date and will be based on a set percentage of the balance outstanding.

A second charge will also become payable from day 31 and will accrue on a daily basis, based on amounts outstanding. As with the first charge, the taxpayer can agree a time to pay with HMRC.

First Charge		
Days after payment due date	Action by taxpayer	Penalty
0 to 15	Payments made or taxpayer proposes a time to pay that is eventually agreed.	No penalty is payable
16 to 30	Payments made or taxpayer proposes a time to pay that is eventually agreed.	The penalty will be calculated at half the full percentage rate (2%).
Day 31	No payment made, no time to pay agreed.	2% of what was due at day 15, plus 2% of what was due at day 30.

Late Payment Interest: From 1 January 2023, HMRC will charge late payment interest from the day your payment is overdue to the day your payment is made in full. The late payment interest will be calculated at the Bank of England base rate at the time **plus** 2.5%.

National Insurance Contributions (NICs)

Class 1 (employees)	Main rate
<i>6 April 2024 to 5 April 2025</i>	
<u>Employee contributions</u>	
- on earnings £242-£967 pw	8%
- on earnings above £967 pw	2%
<u>Employer contributions</u>	
- On all earnings above £175 pw	13.8%

Employer contributions (at 13.8%) are also due on most benefits in kind and on tax paid on an employee's behalf under a PAYE settlement agreement.

From 6 April 2024, Class 1 NICs for employees on earnings between £242-£967 per week have been reduced from 12% to 8%.

Class 2 (self-employed – voluntary)	
Flat rate per week	£3.45
Small earnings exception: profits per annum	£6,725

Class 3 (voluntary)	
Flat rate per week	£17.45
Class 4 (self-employed)	
On profits £12,570 - £50,270	6%
On profits over £50,270	2%

From 6 April 2014, every business or charity in the UK is entitled to benefit from an “allowance” in respect of their employer Class 1 NIC liability. As of 6 April 2022, this “allowance” increased from £4,000 to £5,000.

Previously, self-employed individuals would pay both Class 2 and Class 4 NICs and these will be collected through the Self-Assessment tax return. However, as of 6 April 2024, the UK government abolished Class 2 NICs for self-employed individuals with profits above the lower profits limit of £12,570. As a result, these individuals will no longer have to pay Class 2 NICs but will continue to receive a NI credit towards their state pension and other state benefits. For individuals whose self-employed profits fall within £6,725 and £12,570, they will also receive an NI credit. Going forward, Class 2 NICs will therefore only be payable by self-employed individuals whose profits fall below the £6,725 threshold and wish to make voluntary Class 2 NIC payments of £3.45 per week (£179.40 for the year) to preserve their entitlement to the state pension. Please note that no NIC is levied if the individual is over state pension age.

Stamp Duty (SD)

	% of Total Consideration
Shares and marketable securities (nil if value up to £1,000)	0.5%

Stamp Duty Land Tax (SDLT)/Land Building Transaction Tax (LBTT) in Scotland

SDLT/LBTT imposes a charge on land transactions. LBTT applies in Scotland only. SDLT applies in England and Northern Ireland. Land Transaction Tax (LTT) applies on land transactions in Wales.

The tax is calculated as a percentage of chargeable consideration with different amounts applicable for residential and non-residential transactions. The person liable to pay the tax is the purchaser. In general, the tax must be paid at the same time the return is made. Interest is charged on late paid tax, and on late paid penalties.

We have summarised below the current LBTT and SDLT rates and thresholds which apply on the purchase of residential and non-residential properties.

For lease transactions in Scotland, different rates and thresholds apply, with LBTT payable based on the net present value (NPV) of the rent payable.

Non-Residential Property			
LBTT		SDLT	
Up to £150,000	0%	Up to £150,000	0%
Over £150,000 to £250,000	1%	Over £150,000 to £250,000	2%
Over £250,000	5%	Over £250,000	5%

Residential Property (Single Property)			
LBTT		SDLT	
Rates from 1 April 2021		Rates from 23 September 2022	
Up to £145,000	0%	Up to £250,000	0%
Over £145,001 to £250,000	2%	Over £250,000 to £925,000	5%
Over £250,001 to £325,000	5%	Over £925,000 to £1.5m	10%
Over £325,001 to £750,000	10%	Above £1.5m	12%
Above £750,000	12%		

A supplement applies for both SDLT and LBTT purposes where a second residential property is purchased by an individual for more than £40,000. The rate is 3% for SDLT purposes and 6% for LBTT purposes. A similar regime applies in Wales for LTT purposes. The 6% supplement also applies for LBTT purposes when certain “non-natural persons” (broadly, companies, partnerships, collective investment schemes) purchase a residential property, even if it is their first and only residential property. A 3% supplement applies for SDLT purposes. In Wales, higher rates of LTT are payable in similar circumstances.

For buyers purchasing their first home, the thresholds for LBTT and SDLT vary slightly from those noted in the table below. For those purchasing their first home in Scotland, the LBTT nil rate threshold is increased to £175,000, after which the normal rates apply. For SDLT purposes, the nil rate threshold is increased to £425,000 for those buying a residential property worth £625,000 or less. There is no first-time buyer’s relief under the LTT regime.

In Scotland and Wales, Multi Dwellings Relief (MDR) is available on transactions which involve the purchase of one or more residential properties in a single transaction or series of linked transaction. The relief ensures the buyer does not pay LBTT/LTT at a higher rate than if bought separately and lower rate bands would have applied. For SDLT purposes, MDR was recently abolished, with effect from 1 June 2024.

Single Farm Payment Scheme/Basic Payment Scheme

The BPS is a regional area-based scheme. BPS receipts will be liable to income tax or corporation tax (if paid to a company) and should be included in the taxable trading income in the relevant accounting period. The BPS will continue in Scotland in its current form until the end of 2024.

For more information on the BPS, see pages 467-500.

Commercial Woodlands

Commercial woodlands enjoy a tax favoured status.

For income tax purposes, sales of timber from commercial woodland can be outside the scope of income tax. However, in circumstances where land is predominantly occupied for another purpose, receipts from the sale of timber may fall outside the exemption. For example, receipts from the sale of trees planted on a farm should be included as part of farming profits. An owner of commercial woodlands who simply lets the land will receive income in the form of rent and this would be classed as profits from a rental business.

In relation to capital gains tax, profits from the sale of trees are exempt, but there may be a charge to capital gains tax on a profit on the sale of land (i.e. the solum). Furthermore, the occupation of commercial woodlands is a qualifying activity for roll-over and hold-over reliefs.

Inheritance tax exemption is potentially available through 100% Business Property Relief once a two-year period of ownership of commercial woodlands has been established. Agricultural Property Relief would potentially be available on woodlands whose occupation is ancillary to the agricultural land. An example of this would be a woodland shelter belt.

For more information see the Forestry and Farm Woodlands section on page 307.

Anti-Avoidance

The “General Anti-Abuse Rule” (“GAAR”) came into force with the enactment of the Finance Act 2013 on 17 July 2013. The rule counteracts abusive tax avoidance schemes and applies to income tax, national insurance contributions, corporation tax, capital gains tax, inheritance tax, petroleum revenue tax and stamp duty land tax.

The measure supports the Government's objective of promoting fairness in the tax system by deterring taxpayers from entering into abusive schemes that might succeed under current law. The GAAR provides that tax advantages arising from such arrangements are counteracted on a just and reasonable basis.

The UK GAAR legislation has a 'safety net' arrangement in that there is a requirement for HM Revenue & Customs to seek opinion from an independent panel before invoking the GAAR legislation. There is now a separate Scottish GAAR which initially will only apply to the two devolved taxes (Land and Buildings transaction tax (LBTT) and Scottish landfill tax). The Scottish GAAR has no requirement to bring in an independent perspective and, therefore, gives much more power to Revenue Scotland. It is intended that the Scottish GAAR will extend to all devolved taxes in the future.

Making Tax Digital

In the March 2015 Budget, the Government announced its vision for a new digital tax administration and there was much publicity about this being the death of the annual self-assessment tax return. The transformation of the tax system, to be fully in place by April 2020, was hailed by HMRC as being simpler, more effective, and more efficient.

Under Making Tax Digital (MTD) there will be a requirement to keep accounting records in a digital format and to submit income details, expenditure details and tax computations to HMRC using MTD compatible software on at least a quarterly basis. The new system will have a fundamental impact on record-keeping and businesses/landlords will be required to use digital tools such as cloud software or apps, which will have the ability to upload information to HMRC. Each taxpayer will have an online 'digital account' where they will be able to view their payments.

For VAT periods beginning on or after 1 April 2022 it is now compulsory to keep VAT records in a digital format and to file VAT returns using MTD compatible software.

Originally, HMRC had announced that sole traders and landlords with income of more than £10,000 would be required to file their income tax self-assessment information through MTD from 6 April 2024. However, in December 2022, HMRC announced that, due to delays, the first phase of MTD for ITSA will instead begin in April 2026 and will apply to sole traders and landlords earning above £50,000. From April 2027, the scheme will be extended to those with income exceeding £30,000.

Eventually all businesses and organisations will have to comply with MTD. Quarterly MTD returns will replace the annual corporation tax return and the business pages of self-assessment tax returns. A quarterly return will need to be made for each tax a business pays. Therefore, there will eventually be a requirement to submit a quarterly VAT return, as well as a quarterly corporation tax or income tax return.

Summary of Income Tax and Capital Gains Tax Rates

8.75%	Basic Rate for Dividend Income
10%	Capital Gains Tax Rate for gains attracting Business Asset Disposal Relief
10%	Capital Gains Tax Rate for gains up to Basic Rate limit
18%	Capital Gains Tax Rate for gains on Residential Property up to Basic Rate limit
19%	Starter Rate for Scottish NSND (non-savings/non-dividend) Income
20%	Capital Gains Tax Rate for gains above Basic Rate limit
20%	Basic Rate for Scottish NSND Income
20%	Basic Rate for RUK NSND income
20%	Basic Rate for Savings Income
21%	Intermediate Rate for Scottish NSND Income
24%	Capital Gains Tax Rate for gains on Residential Property above Basic Rate limit
33.75%	Higher Rate for Dividend Income
39.35%	Top Rate for Dividend Income
40%	Higher Rate for RUK NSND Income
40%	Higher Rate for Savings Income
42%	Higher Rate for Scottish NSND Income
45%	Advance Rate for Scottish NSND Income
45%	Top Rate for RUK NSND Income
45%	Top Rate for Savings Income
48%	Top Rate for Scottish NSND Income

Notes

The Scottish Rate of Income Tax (SRIT) only applies to certain types of income. This is non-savings/non-dividend income (NSND) which is broadly salaries, self-employment profits, pension income and rental income.

Please note that if you live in Wales, then you pay Welsh income tax on your NSND. The rates and thresholds of Welsh Income Tax on your NSND are the same as the UK rates.

Miscellaneous

Summary of Farm Management Practices (including useful dates and timings)

Good Agricultural and Environmental Conditions (GAEC) - Scotland

Buffer strips (GAEC 1)

- no cultivations and application of pesticides within 1 Jan - 31 Dec
2m of the top of the bank of watercourses

Water abstraction (GAEC 2)

- submit annual data return by 31 Dec

Muirburn (GAEC 6)

- permitted between and inclusive 1 Oct - 15 Apr
(or 30 Apr with the landowner's permission)

Hedges and trees (GAEC 7)

- no trimming between and inclusive 1 Mar - 31 Aug
(or 31 Jul if hedge/tree in field to be sown with WOSR or TGRS)
- no cultivations and application of fertilisers and 1 Jan - 31 Dec
pesticides within 2m from the centre line of hedges

Greening

Permanent grassland

Nitrogen fertiliser and lime plan prepared by 9 Jun

Ecological Focus Areas (EFAs)

EFA fallow period 15 Jan - 15 Jul

Establish EFA green cover by 1 Nov

Maintain EFA green cover until 31 Dec

Establish EFA catch crop in 'spring'

Maintain EFA catch crop until 31 Dec

Harvest of EFA nitrogen fixing crops after 1 Aug

Cut or graze EFA margins (buffers; cut only, not graze) after 15 Jul

EFA map submit by 15 May

Diffuse Pollution General Binding Rules (DP GBRs) - Scotland

Minimum legal working distances from watercourses:

Within 2m of a watercourse

- no application of inorganic fertiliser
- no application of pesticides
- no cultivation (from top of bank)

Within 5m of a watercourse

- prevent significant poaching

Within 5m of spring, well or borehole

- no fertiliser application
- no cultivation
- no livestock

Within 10m of a watercourse

- no slurry or manure application
- no storage of fertiliser (including temporary field middens)
- no livestock feeders

Within 50m of spring, well or borehole

- no storage of fertilisers (including temporary field middens)
- no slurry or manure application

NVZ - Scotland (SMR 1)

NVZ fertiliser and manure management plan prepared before 1 Mar

NVZ closed periods (organic manures with a high available N content):

	Grassland	Other land
Shallow or sandy soils	1 Sep - 31 Dec	1 Aug - 31 Dec
All other soil types	15 Oct - 31 Jan	1 Oct - 31 Jan

NVZ closed periods (manufactured nitrogen fertiliser):

	Grassland	Other land
Moray, Aberdeenshire, Banff & Buchan NVZ	15 Sep - 20 Feb	1 Sep - 20 Feb
All other Scottish NVZ areas	15 Sep - 15 Feb	1 Sep - 15 Feb

NVZ - England, Wales and Northern Ireland

NVZ closed periods (organic manures with a high available N content):

	Grassland	Other land
Shallow or sandy soils	1 Sep - 31 Dec	1 Aug - 31 Dec
All other soil types	15 Oct - 31 Jan*	1 Oct - 31 Jan*
		*(15 Oct - 31 Jan NI)

NVZ closed periods (manufactured nitrogen fertiliser):

	Grassland	Other land
England and Wales	15 Sep - 15 Jan	1 Sep - 15 Jan
Northern Ireland	15 Sep - 31 Jan	15 Sep - 31 Jan

Business Management

Tax Return

- paper forms submit by 31 Oct
- online submit by 31 Jan

IACS forms (Scotland) submit by 15 May

AECS annual management options claim submit by 15 May

Scottish Suckler Beef Support Scheme claim submit by 31 Dec

Scottish Upland Sheep Support Scheme claim submit 1 Sep - 30 Nov

Agricultural and horticultural census (Scotland) at 1 st Monday in June	complete within 14 days
Agricultural survey (Scotland) at 1 st Monday in December (DAS)	complete within 14 days

Livestock Management

Physiological values and breeding cycles for livestock:

	<i>Cow</i>	<i>Ewe</i>	<i>Red Deer</i>	<i>Sow</i>	<i>Poultry</i>
Gestation (days)					
- mean	285	150	231	114	21
- range	269-299	140-160	226-238	109-125	-
Oestrus period (days)					
- mean	21	16	19	21	-
- range	18-24	14-20	17-21	19-23	16-24

Cattle (Scotland SMR 7):

Tagging calves (after birth):	
▪ beef	within 20 days
▪ dairy - one tag	within 36 hours
▪ dairy - second tag	within 20 days
Replace illegible or lost tags	within 28 days of discovery
Registering calves with ScotEID	within 7 days of tagging
Cattle deaths to be reported to ScotEID	within 7 days
Cattle movements to be reported to ScotEID	within 3 days
Cattle within business movements reported to ScotEID	within 48 hours
Retention of cattle records	at least 10 years

Sheep and goats (Scotland SMR 8):

Identify all animals (after birth):	
▪ intensive systems	within 6 mths
▪ extensive systems (or before they leave the holding whichever is soonest)	within 9 mths
All animals double tagged (one tag must be EID) from 12 mths of age	
Replace illegible or lost tags	within 28 days of discovery
Record details of identification, illegible or lost tags and movements	within 48 hours
Movements sent to SAMU	within 3 days
Retention of sheep records	at least 3 years
Annual inventory for animals kept (SGAI)	at 1 Dec

Pigs (Scotland SMR 6):

Register with local APHA office	within 30 days of the date pigs are first kept
Notify APHA changes of details	within 30 days of the change
Notify off movements to ScotEID	before or on the day of the movement
Notify on movements to ScotEID	within 3 days of arrival
Record on and off movements	within 48 hours of the movement date

Shooting open seasons for birds *

	England, Scotland & Wales	Northern Ireland
Pheasant	1 Oct - 1 Feb	1 Oct - 31 Jan
Partridge	1 Sep - 1 Feb	1 Sep - 31 Jan
Grouse	12 Aug - 10 Dec	12 Aug - 30 Nov
Ptarmigan (Scotland only)	12 Aug - 10 Dec	-
Common snipe	12 Aug - 31 Jan	1 Sep - 31 Jan
Woodcock (except Scotland)	1 Oct - 31 Jan	1 Oct - 31 Jan
Woodcock (Scotland)	1 Sep - 31 Jan	-
Wild duck and geese:		
- below high water mark	1 Sep - 20 Feb	1 Sep - 31 Jan
- elsewhere	1 Sep - 31 Jan	1 Sep - 31 Jan

Shooting open seasons for ground game *

	England, Wales & Northern Ireland	Scotland
Brown hare (not NI)	1 Jan - 31 Dec	1 Oct - 31 Jan
Brown hare (NI)	12 Aug - 31 Jan	-
Mountain hare	-	1 Aug - 28/29 Feb
Rabbit (not NI)	1 Jan - 31 Dec	1 Jan - 31 Dec

Shooting open seasons for deer *

	England, Wales & Northern Ireland	Scotland
Red deer:		
- stags	1 Aug - 30 Apr	1 Jul - 20 Oct
- hinds	1 Nov - 31 Mar	21 Oct - 15 Feb
Sika deer & red/sika hybrids:		
- stags	1 Aug - 30 Apr	1 Jul - 20 Oct
- hinds	1 Nov - 31 Mar	21 Oct - 15 Feb
Fallow deer:		
- bucks	1 Aug - 30 Apr	1 Aug - 30 Apr
- does	1 Nov - 31 Mar	21 Oct - 15 Feb
Roe deer (not NI):		
- bucks	1 Apr - 31 Oct	1 Apr - 20 Oct
- does	1 Nov - 31 Mar	21 Oct - 31 Mar

* all dates inclusive

Imperial-Metric Conversion

Conversion factors

	Imperial	A	Metric	B
Length	inch	25.4	mm	0.03937
	foot	0.3048	m	3.281
	yard	0.9144	m	1.094
	chain	20.12	m	0.04971
	mile	1.609	km	0.6214
Area	acre	0.4047	ha	2.471
	ft ²	0.0929	m ²	10.76
	yd ²	0.8361	m ²	1.196
Volume	ft ³	0.02832	m ³	35.31
	yd ³	0.7646	m ³	1.308
	pint	0.5682	litre	1.76
	gal	4.546	litre	0.22
	gal	0.004546	m ³	219.969
	fl oz	28.41	ml	0.0352
Weight	oz	28.35	g	0.03527
	lb	0.4536	kg	2.205
	cwt	50.8	kg	0.01968
	ton	1.016	t	0.9842
Energy	therm	105.5	MJ	0.009478
	kWh	3.6	MJ	0.2778
	btu	1.055	KJ	0.9478
	hp	745.7	W	0.001341
Temperature	°F	(°F-32)	°C	(°Cx1.8)
		x0.5556		+32
Rate of use	lb/ac	1.121	kg/ha	0.8922
	cwt/ac	125.5	kg/ha	0.007966
	ton/ac	2511	kg/ha	0.0003983
	lb/gal	99.78	g/litre	0.01002
	gal/ac	11.23	litre/ha	0.08902
	units (fert)/ac	1.25	kg/ha	0.8
Unit cost	£/ft ²	10.76	£/m ²	0.0929
	£/yd ²	1.196	£/m ²	0.8361
	£/ac	2.471	£/ha	0.4047
	£/yd ³	1.308	£/m ³	0.7646
	£/gal	0.220	£/litre	4.546
	£/ton	0.9842	£/t	1.016
	£/cwt	0.01968	£/kg	50.8
	£/lb	2.205	£/kg	0.4536

Note: Imperial unit x A = Metric unit
Metric unit x B = Imperial unit

	Imperial	Metric
Length	foot = 12 inches yard = 3 feet mile = 1,760 yards	cm = 10 mm m = 100 cm km = 1,000 m
Area	ft ² = 144 inches ² yd ² = 9 ft ² acre = 4,840 yd ² mile ² = 640 acres	m ² = 10,000 cm ² km ² = 1,000,000 m ² km ² = 100 ha ha = 10,000 m ²
Volume	pint = 20 fluid ounces gallon = 8 pints fluid ounce = 1.734 inches ³ pint = 34.6774 inches ³ gallon = 277.42 inches ³ foot ³ = 1,728 inches ³ yard ³ = 46,656 inches ³	litre = 1,000 ml cm ³ = 1,000 mm ³ m ³ = 1,000,000 cm ³
Weight	lb = 16 oz stone = 14 lb cwt = 112 lb ton = 2,240 lb	kg = 1,000 g tonne = 1,000 kg
Milk	1litre = 1.03 kg	1 kg = 0.971 litre
Irrigation	1 inch/acre = 102.75 m ³	25 mm/ha = 250 m ³
Energy	hp = 550 ft lb force/sec	hp = 75 m kg force /sec
Velocity	mph = 1.609 km/hr	km/hr = 0.6214 mph m/sec = 3.281 ft/sec
Volume	ft ³ /second = 0.02832 m ³ /sec	m ³ /sec = 35.31 ft ³ /sec
Flow rate	gallon/min = 0.07577 litres/sec	litre/sec = 13.2 gallons/min
Specific volume rate	ft ³ /ton min = 0.02787 m ³ /t min	m ³ /t min = 35.88 ft ³ /ton min
Mass flow rate	ton/hr = 0.2822 kg/sec	kg/sec= 3.543 ton/hr

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