Starting Out in Arable Agriculture

Variable Costs and Creating a Budget

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Variable costs are cost that will vary in direct proportion to the scale of the enterprise and they can be apportioned directly to an individual enterprise.

Variable costs that are associated with arable farming are:

- **Fertilisers**
- **Sprays**
- **Seed**
- **Lime**

This fact sheet will provide readers with an overview of variable costs, before providing a worked example of how to prepare a budget for their own farm. Variable costs are important in a farms budget as they vary year on year and vary depending on the crops grown. They can have a big impact on the overall financial performance of a business.

Seed

Crop varieties should be chosen to match the farms conditions, the chosen agronomic strategy, and the intended end use of the grain. Feed markets are less demanding than premium market such as malting barley and milling wheat, which have very specific requirements and lists of approved varieties.

The sowing rate can affect the amount spent on seed; an average sowing rate would be approximately 350seed/m2 for spring barley. Meaning that if a higher sowing rate was needed then more seed would be need increasing the cost of seed.

For a budget any homegrown seed is included and charged at market price, allowing the value of homegrown seed to be used in the current crop budget. As well as market price, any seed treatment and royalties need to be added in too. Royalties must be paid on all home save wheat, barley and oat seed.

Royalty prices vary depending on the crop and can be found on BSPB's (The British Society of Plant Breeders) website, **https://www.bspb.co.uk/**.

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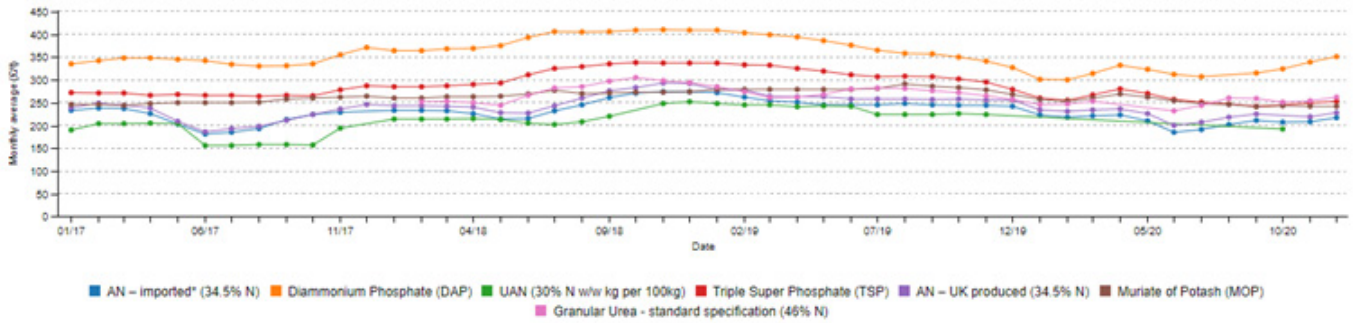
Fertilisers

Many factors affect the level of nitrogen (N), Phosphate (P2O5) and Potassium (K2O) required by a specific crop. These include the previous cropping, yield and straw offtake, the quantity of organic manures used and soil nutrient status. The use of organic manures can reduce the cost of fertiliser. Fertiliser prices rise and fall throughout the year as shown in the graph below, consulting a specialist can help to prepare budget, so the correct fertiliser can be purchased.



Source: Farmers Weekly

Up to date fertiliser prices can be found on the ADHB website **(https://ahdb.org.uk/GB-fertiliser-prices)**. Farmers can also have a look at Planet Scotland **(http://www.planet4farmers.co.uk/Content.aspx?name=PLANET)**, which is a software designed to help farmers improve their financial and environmental performance through better use of organic and bagged fertiliser.

Sprays

For each crop there will be a different cost for spraying pesticides (including herbicides, insecticides, fungicides, nematicides and plant growth regulator). A spraying program should be sought from an agronomist. Spray costs can range in costs due to the crop rotation, soil-type, weed and disease pressures or the weather.

Trade agronomy is included the spray costs, while independent agronomy normally has a fixed fee. Agronomist charges are not included in the below gross margins. They can range from £10/ha for spring crops to £13/ha for winter crops.

Chemical and spraying costs can vary depending on the spraying program from £50-£130/ha. An approximate breakdown of the different spray category percentage costs for spring barley crop is shown below:

	Herbicides	Fungicides	Insecticides	Growth Regs	Other
% of total costs	43%	42%	7%	4%	4%

Herbicides and fungicides have a higher proportion of the costs as they are applied more than once to control weeds and disease, whilst a growth regulator is only applied once to a crop (if required).

Pesticide product authorisation could be amended, suspended, or revoked at any time. To check if a pesticide is still authorised, take a note of the MAPP number on the label, then go to **https://secure.pesticides.gov.uk/pestreg/ProdSearch.asp**. It is advised to speak to an agronomist before applying any sprays to a crop.

Below is an example of a gross margin for the spring barley, more worked examples can be found in the Farm Management Handbook **(https://www.fas.scot/publication/fmh2021/)**.

Grain yield (t/ha)	5.5
Straw yield (t/ha)	2.9
	£/ha
Grain @ £130/t	715
Straw @ £65/t	186
	901
Variable Costs	
Seed @ £419/t	80
Fertiliser	143
Sprays	56
Other expenses	9
	288
Gross Margin	**613**

Yields	In the example gross margin, the yield used is a good commercial average for Scotland. Yields for spring barley can vary from around 5t/ha to 8t/ha. Yields can be variable between seasons, soil type and variety of crop grown. When preparing your own gross margin, it is best to use a realistic yield for your farm.
Grain price	The grain price used in the above example is feed price estimate for the 2020 harvest, at 15% moisture and average quality. Malting barley is priced at a premium to fed barley (approximately £50/t higher) The premium can vary season to season. Malting barley will have required standards to be accepted, with rejected malting crops sold as feed. Each maltings will have their own specifications that crops have to meet. When creating a budget, it is worth calculating the cost of not meeting the target specification.
Straw price	In the example above, straw is sold baled. If straw is being sold in the bout, the price will be lower. Straw prices can vary depending on the season. Values rise when weather conditions mean there will be a shortage. When preparing your own budget, it is useful to include figures specific to your own area.
Seed	The example gross margin is set using certificated seed second generation (C2) sown at 190kg/ha. 190kg/ha x £419/ha purchased seed= £80/ha. Home saved seed should be valued at the current market price, then cleaning, dressing, sacks and BSPB levy added (£53.82 for Spring Barley 2021). Seed prices can also vary depending on the variety chosen and the crop grown.

Fertiliser	Prices used in the gross margin above were: • **Nitrogen (N) – £226/T** • **Phosphate (P2O5) – £250/t** • **Potassium (K2O) – £247/t** The amount of fertiliser applied was 130kg N, 52kg P2O5, 71kg K2O, per hectare. The gross margin assumes that all nutrients are derived from purchased fertilisers. Rates would be reduced if manure, slurry, compost, digestate or sewage sludge are used, as these are a valuable source of nutrients and organic matter (nutrient values for these can be found in the Farm Management Handbook). If straw is removed, then potash applications should be increased. Fertiliser costs per hectare can very if the soil indices are high or low, it is useful to have a soil analysis to help decisions on the rates of fertiliser needed.
Sprays	The sprays that are included in the gross margin above are: Herbicides: post emergence herbicide to control broadleaved weeds. Fungicides: Two applications at Growth stage 31 and 45 for leaf diseases. This is a basic spray programme for a spring barley crop. Additional sprays that could be included are: • **Mildew – £13/ha** • **Wild oat – £22.40/ha** • **Aphids – £6.30/ha** • **Desiccant – £4.40/ha** If you know of specific issues on your farm, it is worth including the extra sprays costs in the budget.
Other expenses	Other costs included in the gross margins are: • **Costs for net wrap at approximately 50-77p/bale, round bales averaging 200kg per bale** Other expenses that could be added in are: • **Marketing costs** • **Weighbridge charges** • **Levies**

A gross margin template is included at the end of this factsheet, for you to create your own gross margins.

Other Considerations

Lime

Lime has not been included in the variable costs in the above costings. Costs for lime vary depending on the type of lime, distance from source of lime, type of haulage and spreading contractor charges. Each year will differ also due to different areas of land being limed. An average calculation of costs is below:

Cost	Rate	Frequency of application	Annual Charge*
£30/T	3.7T/ha	4 years	£27.75/ha

**including delivery and application.*

Contractors Charges

Contractors' charges are not included in the variable costs. Contracting charges can depend on the area contracted, soil type, field size, distance and the level of local competition in the contracting market.

Conclusion

This factsheet has covered the variable costs that are associated with arable farming. It has also demonstrated how a gross margin is created for a crop. It is important to have an idea on how much is being spend on growing a crop, and how much the crop is worth.

For more information:

- **The Farm Management Handbook has example gross margins for all crops (https://www.fas.scot/publication/fmh2021/)**
- **AHDB's website has up to date prices for fertiliser and grain prices (https://ahdb.org.uk/GB-fertiliser-prices).**
- **Farming publications have special features on arable farming.**
- **Farm Advisory Service, https://www.fas.scot/**

Grain yield (t/ha) Straw yield (t/ha)	
	£/ha
Grain @ £__/t Straw @ £__/t	_____
Variable Costs Seed @ £__/t Fertiliser Sprays Other expenses	_____
Gross Margin	_____ _____