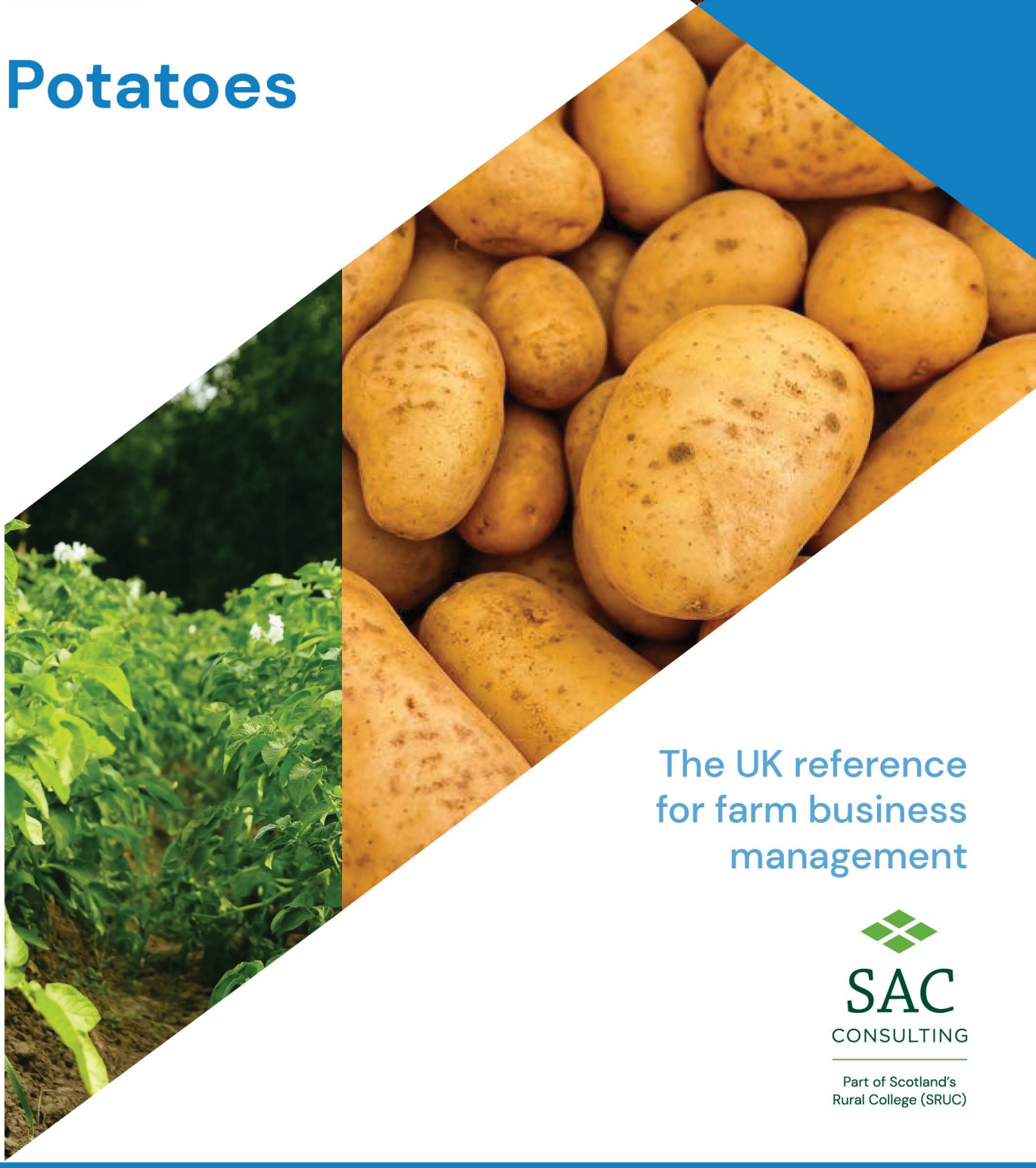
The Farm Management Handbook

Farm Advisory Service

Potatoes



The UK reference for farm business management

SAC CONSULTING

Part of Scotland's Rural College (SRUC)

Updated October 2024

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 Northen 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 processers 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 hectarage 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 : P_2O_5 : K_2O (72 : 136 : 88 units/acre). See Crop Inputs section 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 Labour and Machinery section.

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

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 : P_2O_5 : K_2O (160 : 104 : 160 units/acre). See Crop Inputs section 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	low yield	55
done by regular labour)	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)
	50	(20.2)	65	(26.3)
OUTPUT		**£/ha (acre)**		
Bakers @ £310/t	4,960		7,440	
Pre-pack @ £220/t	5,720		6,820	
Outgrades @ £30/t	240		300	
	10,920	(4,419)	14,560	(5,892)
VARIABLE COSTS				
Seed @ £350/t	840		840	
Fertiliser	444		444	
Sprays	730		730	
Other expenses	2,205		2,867	
	4,219	(1,707)	4,881	(1,975)
GROSS MARGIN	6,701	(2,712)	9,680	(3,917)
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 : P_2O_5 : K_2O (144 : 104 : 160 units/acre). See Crop Inputs section 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	low yield	55
done by regular labour)	high yield	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)
	50	(20.2)	65	(26.3)
OUTPUT		**£/ha (acre)**		
Pre-pack @ £320/t	14,400		18,240	
Outgrades @ £30/t	150		240	
	14,550	(5,888)	18,480	(7,479)
VARIABLE COSTS				
Seed @ £350/t	665		665	
Fertiliser	425		425	
Sprays	768		768	
Other expenses	2,430		3,159	
	4,288	(1,735)	5,017	(2,030)
GROSS MARGIN	10,262	(4,153)	13,463	(5,449)
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 : P_2O_5 : K_2O (144 : 104 : 240 units/acre). See Crop Inputs section 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)
	57	(23.1)	57	(23.1)
OUTPUT		£/ha (acre)		
Off-field @ £175/t	9,100		-	
Ex-store @ £300/t	-		15,600	
Stockfeed @ £30/t	150		150	
	9,250	(3,743)	15,750	(6,374)
VARIABLE COSTS				
Seed @ £350/t	1,050		1,050	
Fertiliser	485		485	
Sprays	635		635	
Other expenses	-		2,864	
	2,170	(878)	5,034	(2,037)
GROSS MARGIN	7,080	(2,865)	10,716	(4,337)
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 : P_2O_5 : K_2O (160 : 104 : 240 units/acre). See Crop Inputs section 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 regular labour)	low yield	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)
	48	(19.4)	48	(19.4)
OUTPUT		£/ha (acre)		
Off-field @ £170/t	7,480		-	
Ex-store @ £270/t	-		11,880	
Stockfeed @ £20/t	80		80	
	7,560	(3,059)	11,960	(4,840)
VARIABLE COSTS				
Seed @ £320/t	1,120		1,120	
Fertiliser	504		504	
Sprays	646		646	
Other expenses	-		2,412	
	2,270	(919)	4,682	(1,895)
GROSS MARGIN	5,290	(2,140)	7,278	(2,945)
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 : P_2O_5 : K_2O (64 : 136 : 88 units/acre). See Crop Inputs section 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 Labour & Machinery section.

(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)
	33	(13.4)	43	(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	
	10,260	(4,152)	13,860	(5,609)
VARIABLE COSTS				
Seed @ £390/t	1,872		1,658	
Fertiliser	316		316	
Sprays	820		805	
Other expenses	2,602		3,362	
	5,610	(2,270)	6,141	(2,485)
GROSS MARGIN	4,650	(1,882)	7,719	(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 : P_2O_5 : K_2O (120 : 120 : 160 units/acre). See Crop Inputs section 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 Labour and Machinery.

(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 shown for Maincrop Ware Processing Crisps, 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)
	45	(18.2)
OUTPUT	**£/ha (acre)**	
Seed @ £300/t	6,600	
Ware @ £250/t	4,750	
Stockfeed @ £30/t	120	
	11,470	(4,642)
VARIABLE COSTS		
Seed @ £300/t	1,140	
Fertiliser	417	
Sprays	741	
Other expenses	3,469	
	5,767	(2,334)
GROSS MARGIN	5,703	(2,308)

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)