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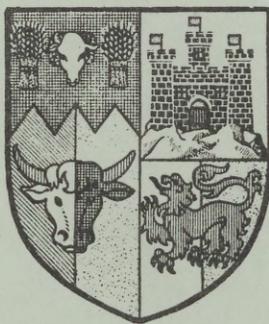
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Potatoes - Cost of prod. 0.5.

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MAINCROP POTATOES

SEED and WARE - 1965 and 1966

by

J.L. ANDERSON, B.Sc.

THE EDINBURGH SCHOOL OF AGRICULTURE, *Dept. of Econ*
WEST MAINS ROAD,
EDINBURGH, 9.

THE EDINBURGH AND EAST OF SCOTLAND COLLEGE OF AGRICULTURE

WEST MAINS ROAD

EDINBURGH, 9

REPORT

ON

MAINCROP POTATOES

SEED and WARE - 1965 and 1966

BY

JOHN L. ANDERSON, B.Sc.

October, 1967.

DEPARTMENT OF ECONOMICS

STAFF

J. D. NUTT, B.A., N.D.A.
A. BLYTH, M.A.
J. D. ROWBOTTOM, B.Sc.
W. B. DUTHIE, B.Sc.
J. A. MACLENNAN, B.Sc.
Miss E. M. WRIGHT, B.Sc., N.D.A..
W. MITCHELL, B.Sc., S.D.D.H., N.D.D., DIP. F.B.A.
P. C. MARTIN, B.Sc., DIP. AG.
A. HUME, B.Sc., N.D.A.
J. D. ELRICK, B.Sc.
J. L. ANDERSON, B.Sc.
M. I. WEBSTER, B.Sc.

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FOREWORD

This report brings together the cost and output data relating to the production of seed and ware potatoes in 1965 and 1966. It is widely recognised that the potato crop plays a significant part in the economy of arable farms where soil and climatic conditions are suitable; it is equally widely recognised that the returns per acre fluctuate markedly from year to year while costs generally show much less change. Ware potatoes are one of the crops for which guaranteed prices are determined under the Price Review system and a degree of control over the production and marketing of the crop is exercised by the Potato Marketing Board. The Board may also intervene directly in the market as a means of ensuring that overall average prices conform with the Price Review determination. These measures have introduced a considerable measure of basic stability - by and large the annual average price will approximate to the guaranteed price. But as yet no means have been found to stabilise the returns to individual producers who are affected, as individuals, by the prices ruling at the times when, for one reason or another, they wish to sell. Indeed, support buying by the Board may not be in operation at times when market prices are lower than the guaranteed price.

It is important that, from time to time, attempts should be made to bring together information on the costs and returns associated with the growing of ware potatoes and, also, similar data relating to seed crops. The returns from the latter must, ultimately, be derived from the former. When such data are made available the farmer has something factual against which he can measure the incidence of the more stable part of the picture, the growing costs, on his own farm. The variable nature of the returns is also set in front of him, whether these arise from over- or under-supply of the market as a whole, temporary or local fluctuations, the choice of variety etc. In the light of this information the farmer can be in a much better position to assess the business risks associated with growing the crop in the circumstances of his own farm.

J. D. Nutt,
Advisory Economist.

CONTENTS

	Page
INTRODUCTION	
The farms concerned	1
General outline	1
PRODUCTION FACTORS	
Seed	3
Fertiliser	3
Planting	6
Weed control	8
Blight control	8
Roguing and inspection of seed crops	8
Haulm destruction	8
Lifting	8
Storage	9
Dressing	10
SALE PRICES	12
GROSS MARGINS	13
Letting potato land	14
AVERAGE RESULTS	15
CONCLUSIONS AND SUMMARY	20
ACKNOWLEDGMENTS	22
APPENDICES:	
A. Costing method	i
B. Acreages by variety planted by registered producers	ii
Seed potatoes - acreages certified in Scotland	iii
Acreage planted by registered producers according to acreage size group	iv
Estimates of production and utilisation of the potato crop	v
C. Average results by size group, county, and variety - distribution of yields by variety and by size group:	
seed crops	vi
ware crops	xii
D. Management appendix	xvii
machinery prices	xviii
indoor storage - guide to costs for new buildings	xix
guide to rates of work per 8 hour day	xx
labour and tractor hours per acre	xxi
typical costs per acre	xxii
budget examples	xxiv
labour requirements based on examples (graph)	xxvi
variable capital profiles based on examples (graph)	xxvii
E. Standard appendix	xxviii

INTRODUCTION

This report summarises the results obtained during a two year survey into the costs of production and returns from the potato crop in the East of Scotland College area. It is part of a general study by the Economics Departments of the three Scottish Colleges, covering the 1965 and 1966 seasons. Some additional information on seed prices for 1967 has also been included where available.

The results for seed and ware crops have been kept separate throughout the report because of the different circumstances involved. The average figures are supplemented by data on the best and worst crops, while the results have been reanalysed by county, variety and size group in Appendix C. Some general statistics are provided to give a background to the enterprise in relation to the overall position in the United Kingdom. Typical costs and other data have been included in the management appendix to help in the preparation of budgets.

Details of the costing method are given in Appendix A. The expenditure has been split into fixed and variable costs in order to provide gross margin information. The gross margin technique is discussed more fully in the report.

The Farms Concerned

The sample of farms was drawn up on a random basis to cover all situations, from farms growing only a few acres to those growing over 50. As production is concentrated in Angus, Perthshire and Fife, most of the farms were situated in these counties, with a few others in the Lothians. No data were obtained from the Border Counties. The sample fell from 63 farms in 1965 to 53 in the second year of the survey, the size and location being summarised in Table I.

Table I also includes an outline of the average cropping as recorded in 1965. Details of cropping were not collected in 1966, but would be similar as the same farms were involved with 2 exceptions allowing for the 10 farms already mentioned.

General Outline

In both years most crops were grown after cereals and were usually dunged. The dung work and ploughing were carried out during the winter and early spring. Planting began in early April, rising to a peak around the end of the month. There was a late slow spring in 1966 but growth came away well in June. Traditional means of weed control remain widely practiced, although sprays were used successfully on a number of farms. Blight was a problem in 1965 but proved less troublesome in 1966. Seed inspection took place during the second half of July and many crops were sprayed down with acid around the end of August.

The 1966 lifting period was much better than the previous year, when a number of crops were never lifted. A greater number of crops were stored inside than were pitted. In a number of cases pits were not fully "happed" during the mild winter of 1966. Losses from disease during storage were less severe than in 1965. Dressing was carried out during the winter and spring (February and March in particular for seed crops), a greater proportion of seed crops being dressed by merchants' squads.

In 1965 prices for seed and ware were generally dull until the early spring after which they rose steadily until the end of the season. The 1966 prices were considerably better than in the previous year and were well maintained throughout the season for both seed and ware crops.

TABLE I

The Sample - Distribution of Farms by County and by Acreage of Potatoes Grown										
Potato acreage	Angus		Perth		Fife & Kinross		Lothians		Totals	
	'65	'66	'65	'66	'65	'66	'65	'66	'65	'66
3 - 4.9	1	1	-	1	2	1	1	1	4	4
5 - 9.9	4	4	4	2	3	1	2	2	13	9
10 - 19.9	5	3	2	3	7	3	2	3	16	12
20 - 49.9	9	8	4	4	7	8	5	5	25	25
over 50.0	2	2	2	-	1	1	-	-	5	3
Totals	21	18	12	10	20	14	10	11	63	53
Average Cropping - 1965										
Crop	Angus and Perth		Fife and Kinross		Lothians					
	acres	%	acres	%	acres	%				
Wheat	14.3	5.9	8.0	3.4	35.1	9.9				
Barley	47.6	19.7	63.3	27.0	102.8	29.3				
Oats	15.2	6.3	13.0	5.5	10.7	3.0				
Sub-totals	77.1	31.9	84.3	35.9	148.6	42.2				
Potatoes	23.3	9.6	23.0	9.7	29.2	8.3				
Sugar beet	5.0	2.0	6.8	2.9	-	-				
Turnips, Kale etc.	13.0	5.4	9.5	4.0	18.6	5.3				
Sub-totals	18.0	7.4	16.3	6.9	18.6	5.3				
Peas	5.4	2.2	-	-	-	-				
Grass:										
1-3 year	45.1	18.5	43.8	18.6	52.8	15.0				
4-6 year	18.0	7.4	35.4	15.0	48.1	13.6				
Permanent	50.0	20.6	32.7	13.9	54.0	15.3				
Sub-totals	113.1	46.5	111.9	47.5	154.9	43.9				
Fruit	5.3	2.1	-	-	-	-				
Other	1.1	.3	-	-	1.1	.3				
Totals	243.3	100.0	235.5	100.0	352.4	100.0				

PRODUCTION FACTORS

Seed

Seed prices per ton, costs and rates per acre are given in Table II. The prices per ton are only approximate as considerable variations occurred depending on when the seed was bought and whether purchases were made through merchants or at special sales, where prices for selected seed could be well above the average. The general trend has been towards higher costs in 1966, with a more marked rise for all varieties in 1967. The 1966 average figures for seed crops show a more substantial increase than was perhaps the general rule, due to the inclusion of 5 crops of Pentland Dell and 1 of Pentland Crown. Excluding these, the average cost for the other varieties was £25.5 per acre.

Seed rates also varied considerably, ranging from 11 cwt to over 50 cwt per acre where brock or ware-grade tubers were planted. The extra storage and handling problems associated with planting ware-grade tubers are not usually justified, with the possible exception of promising new varieties which are being grown on for seed. The use of brock presents the additional risk of disease and therefore cannot be generally recommended.

The typical seed rates for most varieties grown for seed, other than Majestic, Pentland Dell and Pentland Crown, were in the range 24-26 cwt per acre. For the 3 varieties mentioned, the general run was for 30-35 cwt per acre. Ware crops usually required 20-21 cwt with the exception of Kerr's Pink, where a seed rate of 17-18 cwt per acre was more typical. Some crops of Redskin grown for seed were in effect dual-purpose crops aimed at producing a greater percentage of ware than is normal for seed crops. Seed rates for these crops were generally about 22 cwt per acre.

In 1965 72% of seed crops and 60% of ware crops were planted entirely with home-grown seed. The figures for 1966 were 54% and 49% respectively, falling to 49% and 44% in 1967. The increase in the use of purchased seed in 1966 can be attributed to the low level of seed prices for the second year in succession, while the further decline in 1967 can be partly associated with the increased plantings of the newer varieties such as Pentland Dell and Record, necessitating the purchase of new seed.

It is probable that some of the low yields obtained in both years of the survey were due, at least in part, to the crops having been grown from seed which had been retained too long on the same holding. A change of seed is usually beneficial after 3 or 4 years. This can be achieved by direct purchase when prices are reasonable, or alternatively when prices are high, small amounts of fresh seed can be bought and grown on for the following season.

Fertiliser

Fertiliser use for the two years is summarised in Table III. The general recommendation of 100 units of nitrogen and phosphate and 150 units of potash was well exceeded for a number of crops as the average figures suggest. This was particularly true where dung was also applied. It should not be necessary to apply much above the recommended level unless there are exceptional circumstances. Excess levels of fertiliser obviously cost more and there is good evidence to show that too much fertiliser actually depresses yields and may also impair quality.

TABLE II

Guide to Seed Prices per Ton									
Variety	Foundation Stock			"A" certificate					
	1965	1966	1967	1965	1966	1967			
	£	£	£	£	£	£			
Majestic	22	21-23	24-25	15-17	15-17	18-21			
King Edward	18-19	21	-	14-15	15-17	17-22			
Pentland Dell	30-40	35-40	35-40	-	33-35	32-35			
Pentland Crown	-	50-60	50-60	-	-	-			
Redskin	24-26	-	30-33	14-17	20-26	24-26			
Kerr's Pink	-	-	-	15-16	25	26			
Golden Wonder	-	-	-	20	35	36			
Record	-	-	22	12	20-22	20-24			
Arran Pilot	-	-	-	10-12	11-13	30-40			
Home Guard	-	-	-	12	13-15	30-35			
Epicure	-	-	-	16	14-16	25-30			

Average Seed Rates and Costs per Acre									
Seed Crops	1965 ¹			1966			1967		
	No. of crops	cwt	£	No. of crops	cwt	£	No. of crops	cwt	£
Majestic	37	32.3	24.4	23	31.9	26.6	18	30.6	32.5
King Edward	11	24.3	19.3	8	25.6	20.4	5	28.3	31.9
Redskin	6	22.3	17.4	6	22.8	29.2	4	23.3	35.1
Kerr's Pink	6	19.6	12.3	2	17.0	17.0	1	20.0	26.0
Arran Pilot	6	29.6	16.7	-	-	-	-	-	-
Record	6	25.4	15.9	6	25.6	27.4	6	26.1	31.7
Pentland Dell	3	37.7	53.1	5	35.7	52.9	7	32.7	57.7
Pentland Crown	-	-	-	1	26.7	85.0	4	30.4	68.8
Home Guard	3	21.4	12.3	2	26.2	24.0	2	37.1	44.0
Epicure	3	26.0	27.6	1	50.0 ²	37.5	-	-	-
Others	3	25.8	25.0	1	53.3 ³	13.4	-	-	-
Average	-	28.0	21.4	-	29.6	29.1	-	29.5	39.7

Typical seed rate: 30-35 cwt per acre for Majestic, Pentland Dell and Pentland Crown.
24-26 cwt per acre for other varieties.

Typical spacing: 9-12 inches.

Ware Crops	No. of crops	cwt	£	No. of crops	cwt	£	No. of crops	cwt	£
Redskin	28	21.1	17.6	19	20.1	18.9	21	20.7	25.8
Kerr's Pink	15	18.7	13.7	7	15.9	15.9	6	17.6	17.7
Golden Wonder	13	17.9	16.3	10	18.3	22.4	9	19.6	26.7
Record	3	20.0	13.5	2	21.7	17.5	7	19.1	20.3
Arran Consul	3	26.8	22.5	1	25.5	27.0	3	26.6	39.4
King Edward	2	21.5	15.6	-	-	-	2	23.5	22.8
Others	-	-	-	-	-	-	7	34.2 ⁴	43.2
Average	-	20.1	16.3	-	19.1	19.4	-	22.2	27.2

Typical seed rate: 17-18 cwt for Kerr's Pink.
20-21 cwt for other varieties.

Typical spacing: 13-16 inches.

1 Includes crops for which full data were not obtained.

2 Ware grade.

3 Brock

4 Includes crops of Pentland Dell and Crown grown from ware grade seed.

Spinners and fertiliser barrows were more widely used than placement drillers. Only just over 30% of the crops costed in 1966 had the fertiliser applied at the same time as the drilling was done. The use of spinners or barrows usually results in slower rates of work, but has the advantage that capital is not tied up in a specialised implement. Less accurate work is liable to result, however, particularly where the spinner type of implement is concerned and it is possible that the higher fertiliser rates already mentioned, are associated with the use of this type of spreader.

As might be expected the combined driller-fertiliser unit was more widely used on the larger holdings. The complete operation of opening, applying fertiliser, planting and closing was not widely practiced, being generally restricted to 2 row planters. This was largely due to the weight factor of the implement coupled with the difficulty of carrying sufficient seed and fertiliser for long lengths of drill.

TABLE III

Fertiliser, Composition, Rates and Costs per Acre				
Composition ¹	Seed Crops		Ware Crops	
	1965	1966	1965	1966
	units	units	units	units
with F.Y.M.				
N	102	116	127	124
P	103	111	125	129
K	144	161	178	175
no F.Y.M.				
N	98	116	112	120
P	99	121	112	119
K	144	174	169	184
average				
N	101	114	124	123
P	102	114	122	127
K	144	162	176	177
<u>Dressings</u>	cwt	cwt	cwt	cwt
artificials				
range	3.0-17.5	6.0-15.0	6.0-14.0	6.0-15.0
average	8.2	8.7	9.1	8.8
F.Y.M.				
range	tons 8.0-30.0	tons 10.0-30.0	tons 8.0-30.0	tons 7.0-20.0
average - where applied	12.3	13.2	12.8	14.0
average - all crops	8.9	9.5	10.3	10.6
<u>Costs</u> ²	£	£	£	£
range	3.2-16.2	5.9-13.5	6.6-14.4	6.3-13.5
average	9.1	10.2	10.8	10.9
typical	10.0	10-12	11.0	12.0

1 Nutrients derived from the artificials only.

2 Excludes any value for dung applied.

Planting

The first crops were planted around the beginning of April with the main work peak coming at the end of the month and the beginning of May. Most crops are now planted by machine, hand work being generally restricted to the more northerly parts of the College area, to small holdings and for special cases where very expensive seed was being planted. Hand work can still be quicker than mechanical planting where the rate of work is important, provided an adequate squad can be obtained. Partly for this reason, hand work was more widely practiced on the larger farms in Angus and Perth. However, labour shortages coupled with suitable equipment have made mechanical planting an economic proposition on most farms. The position is outlined in Table IV, which includes a series of break-even budgets for the implements in more general use. The figures refer to new equipment and it is therefore possible for the break-even point to be lower still where a suitable second-hand implement can be acquired. The slower rates of work usually achieved by planters should be borne in mind, but will not be critical in most instances. Greater attention may have to be given to the grading of seed for use with a planter.

Chitted seed is still very little used for maincrop potatoes, although a greater acreage could probably be chitted to advantage as this would allow the crop to be planted later on into a warmer seed-bed. This is particularly important with Pentland Dell which is liable to develop little potato disease when planted into cold, wet land. Seed should be boxed 6-8 weeks prior to planting, with the aim of producing a short, thick sprout which is less susceptible to damage. The 3 row semi-automatic type of planter is probably most suitable for chitted seed, although other types have also been used.

Boxes for chitting potatoes (18" x 30" x 6" - 60 to the ton) are likely to cost about £20 per ton to buy new, but should last for at least 10 years with reasonable handling and dry storage. Artificial lighting should not be necessary in most cases, but if required, strip lights capable of lighting about 3 tons each will cost £8-£10 per unit.

Table IV

Notes:-

- 1 Team numbers shown in brackets.
- 2 One or 2 tractors, depending on the length of the field and the rate of work. More down-the-drill work required with hand planting.
- 3 Closing by a planter largely a matter of preference.
- 4 Regular labour and tractor costs have been excluded as these would be largely incurred regardless of the system chosen. The depreciation charges include interest at 8% on half the purchase price, the equipment being written off completely in 5 years. The casual labour costs are based on the typical hours given above. Workers in the large squad have been charged at 4s.6d. per hour and the remainder at 4s.2d. At the break-even acreage the annual depreciation charges and the associated casual labour costs for a planter are equal to the outlay required for a squad. Above the break-even acreage it should be cheaper to plant by machine.
- 5 Break-even calculations based on the figure for the large squad.

TABLE IV

Planting - Guide to Rates of Work and Costs per Acre						
	Squads		Planters			
	small	large	semi-automatic		automatic	
			2 row	3 row	2 row	3 row
<u>Range in:</u>						
team hours (planting)	1.2-8.5	.5-2.7	1.6-4.5	1.1-3.4	1.1-3.3	.8-3.3
number of cas. workers	1-6	7-36	0-2	0-4	0-2	0-2
cas. labour costs	£ 1.4-3.2	£ 1.0-5.0	£ 0-1.5	£ 0-1.8	£ 0-.8	£ 0-.5
Summary of typical hours ¹						
<u>Carting</u> ²						
reg. labour	1.3	2.6(2)	.7	1.4(2)	1.4(2)	1.4(2)
tractor	1.3	2.6(2)	.7	1.4(2)	1.4(2)	1.4(2)
<u>Planting</u>						
cas. labour	9.3(4)	13.6(12)	6.0(2)	6.6(3)	-	1.6(1)
reg. labour	4.7(2)	3.4(4)	3.0(1)	2.2(1)	2.3(1)	1.6(1)
total labour	14.0	17.0	9.0	8.8	2.3	3.2
tractor	-	-	3.0	2.2	2.3	1.6
team hours	2.3	1.1	3.0	2.2	2.3	1.6
approx. acreage planted in 8 hours	3.5	7.0	2.7	3.6	3.5	5.0
<u>Closing</u> ³						
reg. labour & tractor	1.0	1.0	incl. above	1.0	incl. above	1.0
Partial budgets: large squad - mechanised planting ⁴						
	£	£	£	£	£	£
Purchase price	-	-	160	200	200	310
depreciation per annum	-	-	39	48	48	75
Depreciation per acre at break-even acreage	-	-	2.3	2.2	3.6	3.3
Cas. labour transport	-	3.1	1.3	1.4	-	.3
	-	.5	-	-	-	-
Total	-	3.6	3.6	3.6	3.6	3.6
Break-even ⁵ acreage	-	-	17	22	13.5	23

Weed Control

Traditional cultivations remain the most widely used means of controlling weeds. A number of crops were treated chemically with satisfactory results. Costs ranged from £2-£3 for paraquat to £5-£6 per acre where mixtures of paraquat and residual herbicides were used. There was little difference between farm costs for actual materials and the full contract rate per acre. Spraying was usually done about the time the crop was starting to come through the ground. In a few cases where the crop was sprayed, the crop was cultivated and run up 2-3 weeks after planting. Normal cultivations took 2-4 hours per acre, depending on the conditions, compared with .5 hours per acre when the crop was sprayed. There was a useful saving in time, even allowing for the cultivations sometimes given.

Chemical weed control offers a practical alternative to traditional methods of weed control, particularly where labour is at a premium, on steep-lying fields where accurate cultivations are difficult and on light land where moisture loss can be important.

Blight Control

Blight was a less serious problem in 1966 compared with the previous year. Contract spraying cost rather more, rising to around 30s. per acre for each application. Aerial spraying was encountered on 1 farm where costs were 52s. per application - much the same as in 1965. Materials for farm use cost about 20s. per acre in both years. Several crops were sprayed 2 or 3 times.

Spraying must be done before the disease becomes established and must be continued until such time as the danger has passed or the crop is burnt down. When infection becomes widespread, the haulm should generally be burnt down immediately in order to reduce the chance of tuber infection. Earlier planting will help to reduce the losses from blight in most years as the crop should be further on before suitable conditions for the disease occur.

Roguing and Inspection of Seed Crops

In both 1965 and 1966 many seed crops were rogued by the farm staff or by the farmer himself. This was usually done in early July in preparation for inspection during the second half of the month. Contract roguing was done on a number of farms, typical charges being in the range of £1-£2 per acre. The inspection by the Department of Agriculture for Scotland cost 15s. per acre. (It should also be remembered that certificates cannot be granted to crops unless the field has been tested for eel worm. Soil tests must be carried out during the autumn for each field intended for seed potatoes in the following year.)

Haulm Destruction

Spraying down with acid was by far the most common method of killing the haulm. The job remains a specialised one done by contractors. The typical charge increased to around 65s. per acre. Other sprays, such as diquat or chlorate were also used, costing about 50s. and 16s. per acre respectively. These sprays are not very quick in their action and are not suitable for crops which have become infected with blight. A number of crops were pulverised but again the method is unsuitable if blight is present.

Lifting

The 1966 lifting season was generally a much easier one than the previous year. Work began during mid September and was practically

completed by the end of October. There were wide variations in the rates of work and squad numbers. A general summary of the rates of work and costs per acre is shown in Table V, on page 11.

The table also gives a series of partial budgets in order to give some indication of the costs associated with different methods of lifting. With the introduction of a complete harvester, the main points to remember are the slower rate of work likely to be achieved while requiring the same regular labour team. (See graphs facing page xxvi in the management appendix.) The problem of obsolescence should also be borne in mind, as the design of harvesters is still very much at the development stage. Harvesters can well become obsolete before the end of their working lives. Judging from the experience of several farmers in the survey, it is important to have a demonstration on the farm before a purchase is made. Harvesters have done well on some farms but equally, they have not been a success on many others. On a few farms visited, harvesters had been bought but had been little used as they proved unsatisfactory.

Pallet box systems were used on 3 farms. In 1 case the boxes were loaded on trailers, filled direct from a harvester and unloaded in the store with the aid of a special tippler device. In the remaining cases the boxes were filled by the lifting squad. In 1 case the boxes were emptied into trailers in the field and in the other, were loaded on trailers and emptied in the steading, requiring extra handling equipment.

Costs were about £150 for the lifting and tipping mechanism, while boxes cost £4-£5 each, (approximately 5 cwt capacity), 20-40 being required depending on the system of lifting. Fewer boxes were needed for use with the harvester, making the system the cheapest of the three.

Storage

Over 60% of the crops were stored undercover, mainly in adapted or general-purpose buildings. The capital requirements varied considerably depending on the situation. Adaptions were generally quite cheap but costs for new buildings were substantial and are continuing to rise. Expenditure is now likely to be in the region of £8-£9 per ton (before allowing for grant aid) for a general-purpose frame building with reinforced cavity walls and concrete floor. (An example budget is given in Appendix D.) The resulting annual charge for such a building is likely to be around £11-£12 per acre or roughly 20s.-22s. per ton if the cost is written down over 10 years and assuming that the building is filled to capacity. These figures might well be less if part of the work could be done with farm labour.

If it is assumed that there is no charge for straw when the crop is stored indoors (the straw required round the walls etc. being re-used for bedding), there are relatively few savings to be made other than the cost of straw for pit storage. Bunched wheat straw has cost about £8 per ton during the last 2 years, but has been known to reach double this figure. As approximately 1 cwt of straw is required for every ton pitted, the resulting saving by storing inside is likely to be of the order of 8s.-16s. per ton.

Winter covering is normally done by regular labour while dressing rates appear to be only marginally quicker indoors, although a higher standard of work can be expected as a result of the better conditions. The saving in labour may come to .5 man hours per ton or say 2s.-3s. bringing the total figure to 10s.-19s. The net cost per ton (structure cost less savings in straw and labour) is therefore unlikely to be more than about 12s. per ton and could well be less than 8s. if straw rises in price.

At this level the cost of indoor storage is reasonable, considering the improvement in storage and working conditions and the freedom to work and sell at any time without regard to weather conditions outside. Dressing can be done at any suitable time, on wet afternoons for example, the crop being under cover and handy for dispatch without further transport, as is often required if dressing from a pit. The dry conditions indoors are also much more suitable for the paper bags now coming into general use for ware crops.

Dressing

Most crops were stored and dressed out during the winter and spring. In 2 cases Record grown on contract was dressed green and the ware taken away immediately. Two other crops were sold as green ware. In these 4 cases the dressing was done rather more quickly as direct handling from carts or pallet boxes helped to speed up the operation and there were less diseased tubers to remove. Normally the typical labour requirement was for 4.2 hours per ton, equivalent to .7 team hours per ton with 6 workers. There was little difference in the rate of work between dressing squads working outside and those working indoors as shown by the records. However, many crops were dressed on contract by merchants and the hours were therefore estimated, which could well be the reason why results were not more positive in this respect. Moreover contract squads were often paid on a per ton basis and as a result throughput probably came first place provided the sample was "good enough". One would expect faster work indoors given an identical team dressing to the same standard.

Contract charges varied considerably ranging from 20s.-40s. per ton, the typical charges lying between 24s. and 32s. Fuel costs were not important, averaging 2s.-4s. per acre. Inspection and sealing fees for

Table V

Notes:-

- 1 Team numbers shown in brackets.
- 2 Results available from only one farm.
- 3 Regular labour and tractor costs have been excluded as these would be largely incurred regardless of the system chosen. As the budgets are intended to compare hand work with complete harvesters, the costs per acre have not been calculated for the diggers. It is assumed that these implements would be retained for use in even of breakdown or bad weather and that the annual charges would still have to be met. The depreciation charges include interest at 8% on half the purchase price and the harvesters have been written off completely in 4 years. The casual labour costs are based on the typical figures given above. Squad labour has been charged at 4s.9d. per hour and work with harvesters at 4s.2d. per hour. At the break-even acreage the annual depreciation charges and associated costs for complete harvesters are equal to the outlay required for a squad. Above the break-even acreage it should be cheaper to lift by harvester.
- 4 Break-even calculations based on the figures for elevator diggers.
- 5 Some crops were lifted by squads working on a contract basis. Typical charges ranged from £18-£20 per acre, including transport.

TABLE V

Lifting - Guide to Rates of Work and Costs per Acre						
	Diggers			Harvesters		
	Spinner	Elevators		1 row		2 row
	1 row	1 row	2 row	£800- £1000	£1100- £1300	£1650
<u>Range in:</u>						
team hours	2.0-10.7	2.0- 6.0	1.2- 5.6	3.5- 7.6	3.0- 4.4	2.8- 4.2
number of cas. workers	3-66	7-36	9-40	3-6	3-6	5-7
cas. labour costs	£ 6.8-20.4	£ 10.0-27.3	£ 10.0-25.9	£ 2.4- 8.2	£ 2.1- 4.8	£ 3.2- 5.6
Summary of typical hours ¹						
<u>Lifting</u>						(Estimates ²)
team number (casual)	12-15	20-24	20-30	4-5	5	6
hours:						
cas. labour	58.8(14)	66.0(22)	67.5(25)	22.0(4)	17.5(5)	18.0(6)
reg. labour	4.2(1)	3.0(1)	2.7(1)	5.5(1)	3.5(1)	3.0(1)
total labour	63.0	69.0	70.2	27.5	21.0	21.0
tractor	4.2	3.0	2.7	5.5	3.5	3.0
<u>Carting</u>						
reg. labour & tractor	8.4(2)	6.0(2)	8.1(3)	11.0(2)	7.0(2)	9.0(3)
<u>Shed/Pit</u>						
reg. labour	4.2(1)	3.0(1)	2.7(1)	5.5(1)	3.5(1)	3.0(1)
Approx. acreage lifted in 8 hours	1.9	2.7	3.0	1.5	2.3	2.7
Partial budgets: elevator diggers - complete harvesters ³						
	£	£	£	£	£	£
Purchase price	-	250	300	950	1300	1650
depreciation per annum	-	60	72	276	377	479
Depreciation per acre at break-even acreage	-	-	-	12.1	12.5	12.4
Cas. labour	-	15.7	16.0	4.6	3.6	3.8
transport	-	1.7	1.5	-	-	-
Repair allowance	-	.7	.7	1.5	2.0	2.0
Total	-	18.1	18.2	18.2	18.2	18.2
Break-even ⁴ acreage	-	-	-	23	30	39
Break-even ⁵ acreage - contract squad @ £19	-	-	-	20	27	34.5

virus tested, foundation stock and stock seed came to 9s. per ton. Bags were usually provided by the merchants. Where potatoes were sold direct to the public, paper bags cost 6d. each or £1 per ton.

SALE PRICES

The two years covered by the survey provide a good example of how the level of prices can vary between one year and the next.

In 1965 a substantial ware surplus of around 575,000 tons was produced which gave rise to considerable support buying during the autumn and winter by the Potato Marketing Board. This unfortunately did not raise prices by any marked degree, the trade remaining dull until the early spring. At this stage it was realised that disease losses had been greater than expected and that reserves might not be as substantial as previously supposed. Much of the stock bought up by the Board during the autumn and winter had been released for stockfeed or for export and was no longer available for human consumption. Against this background, ware prices rose steadily from the beginning of February to finish the season at a relatively high level.

Many producers made very little from potatoes during 1965 and as a result cut back their acreage in 1966 to such an extent that there was some doubt as to whether an adequate crop had been planted. Fortunately however, 1966 proved to be another year of high yields and the tonnage produced from the lower acreage was more or less sufficient to meet demand. The balance of supply meeting demand provided a firm base for prices throughout the season.

The price structure for seed potatoes was very similar to that for the ware trade during 1965. Prices remained relatively low for most varieties during the greater part of the season, only rallying from late March onwards after the bulk of the crop had been cleared. Majestic and King Edward prices for 'A' seed fell below the ware price per ton for a brief period at the turn of the year.

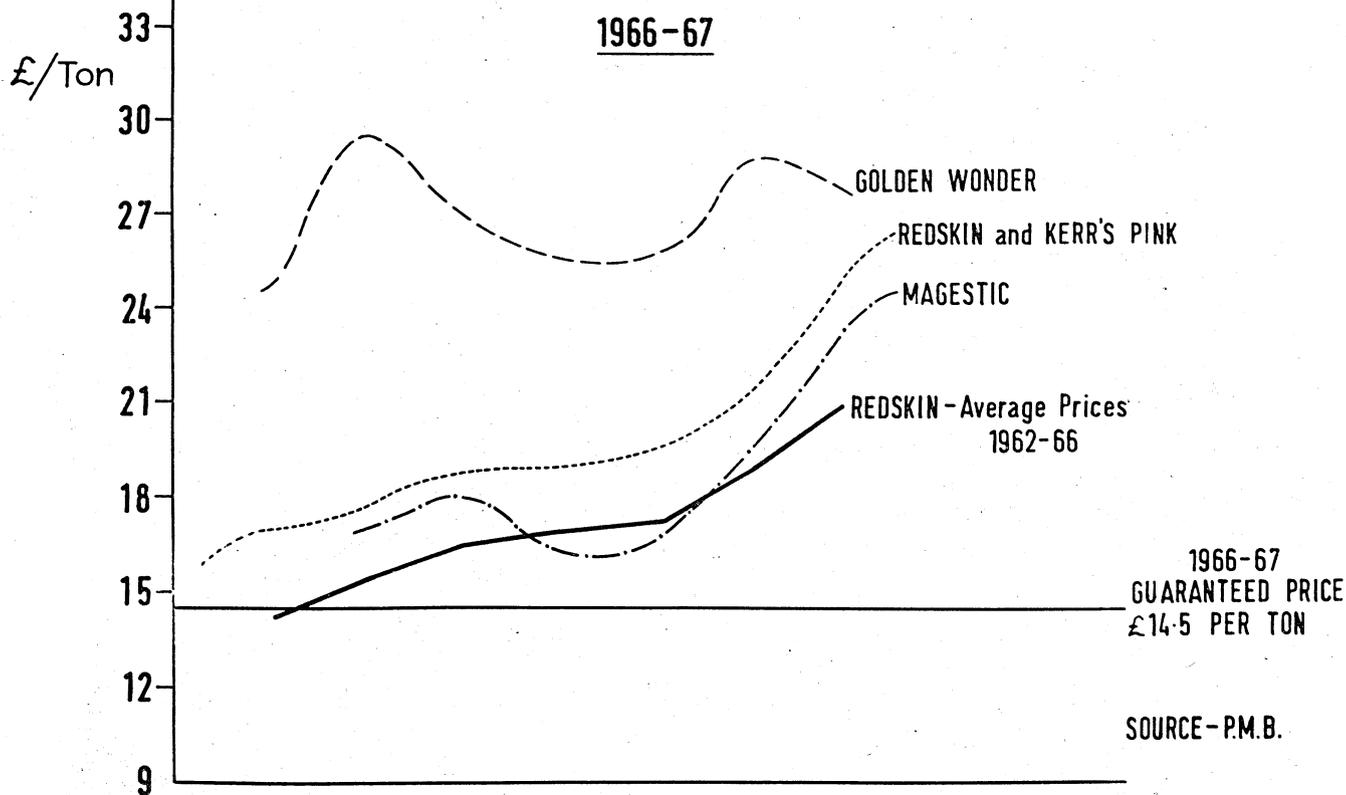
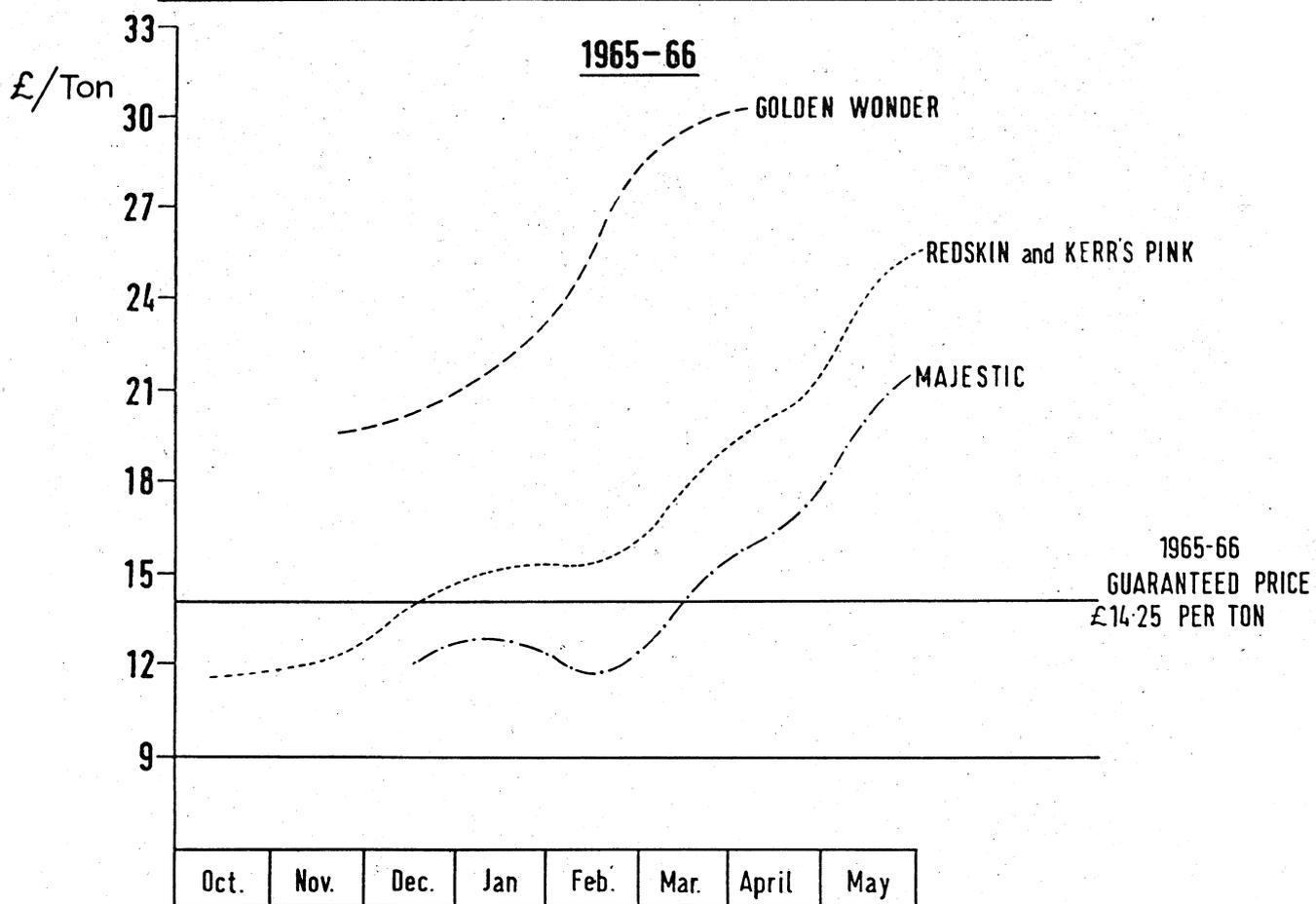
The 1966 season started off on a more optimistic note with prices well up on the previous year. Many producers held off the market, hoping for a further increase. In practice however, the peak for most varieties was reached in the early part of the season and began to deteriorate after the new year. Producers continued to hold off the market in the hope of a recovery, but as the year wore on and dressing could not be delayed any longer, supplies began to come onto the market in quantity. Prices fell away as a result, reaching their lowest point in early March after which there was a slow recovery during the final weeks.

The firm nature of the ware market influenced the seed trade to some extent, in-so-far that some producers dressed their seed over a 2" riddle instead of $2\frac{1}{4}$ " which gave an increased ware fraction. Thirds ($1-1\frac{1}{4}$ ") made a good trade in 1966, in some cases bringing in an extra £1 per ton above the normal seed price.

The approximate price trends for both seed and ware are shown in Graphs I and II. Arran Pilot was a notable failure among seed crops in 1965, but made a substantial recovery in the following year. Ware prices show a gradual rise through the season in both years with the exception of Golder Wonder which wavered between £25 and £30 during the 1966 season. The average price trends over the last 5 years for Redskin ware show a gradual rise as the seasons progressed, while the average for Majestic seed remained consistent about the £20 per ton level.

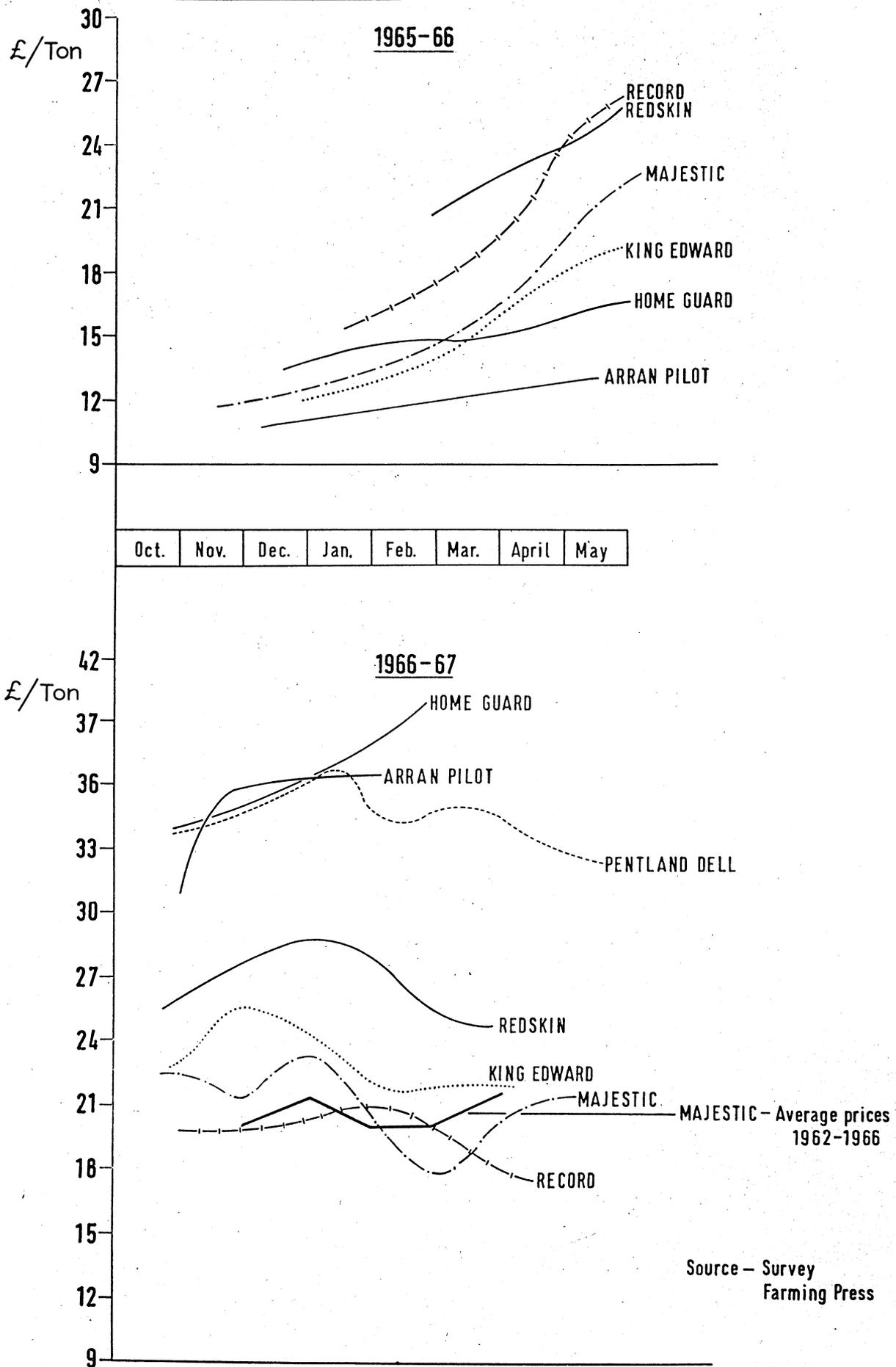
GRAPH I

WARE - APPROXIMATE TRENDS IN PRODUCERS PRICES PER TON



GRAPH II

APPROXIMATE TRENDS IN PRODUCERS PRICES PER TON—
SEED 'A' CERTIFICATE.



Some producers were able to improve their returns by direct sale to the public or to retailers, allowing for the additional care which is necessary for this type of sale. In the general trade, buyers are obviously less demanding in years of short supplies, but there would appear to be a case for better prices when samples are of above average quality and well presented. Good samples were more easily cleared in 1965 although the trade provided little in the way of improved returns for such crops, the benefit being mainly that of being able to sell when buyers would not otherwise be interested.

Two farms grew potatoes under contract for manufacturing, in both cases the variety being Record. Contracts of this type offer an alternative outlet to producers, being best suited to the better farms where yields are more likely to be consistently good. The farmers benefited from the agreed price in 1965, (£14-£15 per ton) while the manufacturers came out best in 1966.

GROSS MARGINS

The average costs of growing potatoes have been split into "variable" and "fixed" costs in this report. By deducting the variable costs from the total output (sales + value of crop retained), one arrives at the "gross margin".

The variable costs include seed, fertiliser, casual labour, contract services and sundry costs such as spray materials, repairs and the P.M.B. levy. These items tend to vary in direct proportion to the scale of the enterprise, the total increasing or decreasing with the acreage grown.

The other items of expenditure associated with the costs of production are included among the fixed costs. These are not specific to any one enterprise, with the exception of charges for specialised equipment and buildings, which are included among the fixed costs because the annual charges have to be met regardless of the acreage grown. The fixed costs do not vary in direct proportion to the scale of the various enterprises. This is partly due to the nature of many of the items concerned - for example, a new tractor cannot be bought in half quantities, but must be purchased complete.

The gross margin technique of planning is based on the appreciation of possible changes which may occur if a particular course of action is taken. This appreciation must include an appraisal of the husbandry and technical aspects, as well as the purely economic considerations. Small variations in the scale of particular enterprises are unlikely to necessitate changes in the regular labour force, specialised equipment or other so-called fixed costs, with the result that comparisons at the gross margin level are usually adequate. Where changes are more extensive the gross margin approach still forms the basis of the plan, with any alterations in the fixed cost sector being made in order to completely assess the value of the project.

Because the variable costs include seed, casual labour and contract services, it should be remembered that the differences in total variable costs can amount to considerable sums of money, depending on the individual circumstances. These variations automatically affect the gross margins and tend to have repercussions among the fixed costs. Higher outlays on casual labour and contract services are likely to be associated with lower requirements for regular labour and specialised equipment, and vice versa.

These points are made clearer in Table VI where the budget examples given in the management appendix (page xxiv) are taken as the basis for

discussion. In the first part of the table a common level of output has been assumed in order to emphasise the effect of the variable costs on the resulting gross margins. The second part of the table indicates the need to appreciate the other direct costs involved when taking the gross margin as a standard of performance, particularly where the enterprise is being introduced to a farm system. A gross margin of £70 per acre is obviously much less satisfactory for System B.

TABLE VI

Gross Margin Considerations ¹				
System A	Seed crop, planted and lifted by hand, pit storage, dressed by merchant.			
System B	Ware crop, planted and lifted by machine, shed storage, dressed by regular labour with some casual assistance.			
	System A		System B	
Total output per acre	£160		£160	
<u>Variable costs per acre</u>				
seed	£35.2		£25.0	
fertiliser	11.0		11.0	
casual labour	36.0		7.5	
contract	6.2		3.2	
sundry	8.8	97.2	11.6	58.3
Gross margin per acre	£62.8		£101.7	
If the gross margin had worked out at £70 per acre for both systems:-				
Gross margin	£70.0		£70.0	
Specialised equipment charges per acre	£5.1		£26.7	
Hours of regular labour required	34.9 hrs.		63.3 hrs.	

1 See narrative.

As a general guide, a gross margin of £70 per acre will be satisfactory where the crop is lifted by hand, but a higher figure is preferable where there is a heavy commitment on specialised equipment, etc. It is possible that a lower gross margin would be acceptable, depending on the relative profitability of other enterprises and the degree to which savings in fixed costs might be achieved if the enterprise were discontinued.

Letting Potato Land

This report has dealt entirely with crops grown by farmers on their own land, although a considerable acreage is let annually to merchants, particularly for seed production. The rates have been around £30 per acre where the merchants have done all the work, rising to £38-£42 where much of the tractor work has been done by the farmer, with variations above and below these figures.

Letting the potato land can be a useful means of maintaining a break crop in the rotation when labour or other difficulties would other-

wize preclude the enterprise. It also provides a relatively secure return without the worries normally associated with potato production.

Whether to retain the crop or to let to a merchant will depend very much on the individual circumstances. The price received is equivalent to the gross margin which can be compared with the alternatives and considered in the light of any changes which may arise among the fixed costs of the business. The convenience of letting may well be the deciding factor in some cases.

AVERAGE RESULTS

The average results for the two years are summarised in Tables VII to X and are also reanalysed by county, size group and variety in Appendix C. A break-down of yields per acre on a variety basis and by size group is also included in Appendix C.

The tables all show a marked improvement in results during 1966, with prices up and yields improved in all but one instance where the average yield for ware crops grown in Angus and Perthshire fell slightly in 1966. Higher seed and casual labour costs were mainly responsible for the rise in total variable costs. (The higher casual labour costs shown for the seed crops can be attributed to the greater use of casual labour for dressing, compared with ware crops.) These increases were well covered by the rise in output with the result that the gross margins were also substantially up on the 1965 levels. Fixed costs remained much the same for ware crops while those for seed crops showed a small increase, regular labour being the main item.

The sample has also been split into best and worst crops for comparison with the average. In both years, yield was the principle difference between the groups. This can be associated to some extent with choice of variety, particularly among the seed crops, the best group including the newer varieties such as Pentland Dell in 1966. This point was also evident among the larger farms when the results are split according to the potato acreage grown. The larger holdings growing for seed were more adventurous with regard to new varieties. The smaller holdings tended to grow the traditional varieties, rather than embark on a new one which involved increased expenditure on seed in the initial stages and which was largely an unknown quantity from the point of view of yield or market acceptance. This can be explained in part when it is appreciated that the larger holdings can experiment with new varieties on a small scale without critically affecting the returns from the potato enterprise as a whole. On the small farm, potatoes are one of the most important cash crops. As such, a modest but relatively safe return is probably the best course, rather than risk a failure with a new variety.

The more profitable crops tended to be grown on the larger holdings partly due to these being situated on better land and possibly also to a higher level of management and marketing ability in some cases. These farms tended to grow the newer varieties, as already mentioned. The results were less clear cut among the ware crops as size of holding appeared to be less important, some of the more profitable crops being grown on smaller farms. Returns were sometimes improved by direct sale in these cases. Yields of Golden Wonder were substantially better in 1966.

Investment in specialised equipment was lowest among the small farms, as might be expected; the equipment was often second-hand, planting being done by hand in a few cases and dressing sometimes being done with merchants' equipment. On the larger farms investment tended to be at a higher level as the equipment was more up-to-date, larger implements cost more and some farms had new buildings for storage purposes.

TABLE VII

Average Results per Acre - Seed Crops 1965

	Best 20		Average		Worst 20	
	£	£	£	£	£	£
<u>Output</u>						
seed - sold	84.2		61.2		31.8	
retained	28.2	112.4	21.9	83.1	3.6	35.4
ware - sold	63.3		47.0		29.5	
retained	5.2	68.5	1.6	48.6	.5	30.0
brock		1.4		1.8		2.6
Total output		182.3		133.5		68.0
<u>Variable costs</u>						
seed		18.0		20.9		20.2
fertilisers		8.7		9.1		8.9
casual labour incl. transport		20.6		21.3		21.5
contract		3.7		3.1		2.2
fuel excl. tractor		.1		.1		.1
sundry - P.M.B. levy	3.0		3.0		3.0	
inspect. fee	.8		.8		.8	
straw	1.9		2.1		2.6	
sprays etc.	2.5	8.2	1.4	7.3	.8	7.2
Total variable costs		59.3		61.8		60.1
Gross margin		123.0		71.7		7.9
<u>Fixed costs</u>						
regular labour		14.6		14.1		11.9
tractor deprec. etc.		6.4		6.3		5.8
specialised equipment depreciation etc.		6.2		6.3		6.9
rent		5.5		5.1		4.7
overheads		22.0		22.0		20.7
Total fixed costs		54.7		53.8		50.0
Total costs		114.0		115.6		110.1
Estimated profit or loss		68.3		17.9		-42.1
Average yields - seed (tons per acre) ware brock	6.34 3.98 .71	11.03T	5.08 3.22 .93	9.23T	2.62 2.34 1.37	6.33T
Average seed price/ton		£17.7		£16.35		£13.5
Average ware price/ton		£17.1		£15.1		£12.8
Average seed rate		25.8c		27.6c		30.5c
Average seed cost/ton		£13.95		£15.35		£13.25
Average fertiliser rate		8.5c		8.2c		7.6c
units of N		100		101		99
P		102		102		103
K		145		144		147
Average hours - cas. lab.	87		87		85	
reg. lab.	48	135	46	133	35	120
tractor		28		28		26
Number of crops		20		71		20
Total acreage		189		795		204
Average acreage		9.4		11.2		10.2

TABLE VIII

Average Results per Acre - Seed Crops 1966

	Best 15		Average		Worst 15	
	£	£	£	£	£	£
<u>Output</u>						
seed - sold	170.7		117.7		94.7	
retained	45.1	215.8	30.4	148.1	18.7	113.4
ware - sold	69.4		64.5		41.9	
retained	2.2	71.6	2.0	66.5	-	41.9
brock		1.7		1.8		1.6
Total output		289.1		216.4		156.9
<u>Variable costs</u>						
seed		35.5		29.1		26.6
fertilisers		10.1		10.2		10.6
casual labour incl. transport		23.6		25.4		28.3
contract		4.3		3.5		3.6
fuel excl. tractor		.2		.2		.1
sundry - P.M.B. levy	3.0		3.0		3.0	
inspect. fee	.8		.8		.8	
straw	.8		1.5		1.8	
sprays etc.	2.3	6.9	2.0	7.3	2.0	7.6
Total variable costs		80.6		75.7		76.8
Gross margin		208.5		140.7		80.1
<u>Fixed costs</u>						
regular labour		16.3		14.9		14.2
tractor deprec. etc.		6.1		6.4		6.8
specialised equipment depreciation etc.		8.6		6.8		6.1
rent		5.1		5.1		4.8
overheads		23.0		23.4		24.5
Total fixed costs		59.1		56.6		56.4
Total costs		139.7		132.3		133.2
Estimated profit		149.4		84.1		23.7
Average yields - seed (tons/acre)	7.94		6.29		5.25	
ware	3.66		3.46		2.28	
brock	.73	12.33T	.79	10.54T	.83	8.36T
Average seed price/ton		£27.2		£23.5		£21.6
Average ware price/ton		£19.5		£19.2		£18.5
Average seed rate		29.8c		29.6c		29.9c
Average seed cost/ton		£23.8		£19.7		£17.8
Average fertiliser rate		8.7c		8.7c		9.1c
units of N		119		114		113
P		121		114		112
K		153		162		162
Average hours - cas. lab.	88		94		103	
reg. lab.	54	142	48	142	45	148
tractor		27		28		30
Number of crops		15		55		15
Total acreage		173		566		137
Average acreage		11.6		10.3		9.1

TABLE IX

Average Results per Acre - Ware Crops 1965

	Best 15		Average		Worst 15	
	£	£	£	£	£	£
<u>Output</u>						
seed - sold (uncert.)	9.6		3.9		.6	
retained	19.7	29.3	12.3	16.2	5.6	6.2
ware - sold	157.3		110.9		62.0	
retained	8.7	166.0	4.3	115.2	1.8	63.8
brock		.8		1.6		2.1
Total output		196.1		133.0		72.1
<u>Variable costs</u>						
seed		16.4		15.7		15.3
fertilisers		10.4		10.8		11.1
casual labour incl. transport		19.6		16.2		13.1
contract		4.2		3.7		1.9
fuel excl. tractor		.1		.1		.1
sundry - P.M.B. levy	3.0		3.0		3.0	
straw	2.8		2.1		1.4	
sprays etc.	2.6	8.4	1.8	6.9	1.7	6.1
Total variable costs		59.1		53.4		47.6
Gross margin		137.0		79.6		24.5
<u>Fixed costs</u>						
regular labour		16.3		17.0		15.1
tractor deprec. etc.		6.6		6.6		6.2
specialised equipment depreciation etc.		6.1		7.1		7.5
rent		5.8		5.5		5.4
overheads		22.7		21.7		19.1
Total fixed costs		57.5		57.9		53.3
Total costs		116.6		111.3		100.9
Estimated profit or loss		79.5		21.7		-28.8
Average yields - seed	1.41		.84		.32	
(tons per acre) ware	9.28		6.84		3.85	
brock	.38	11.07T	.77	8.45T	1.04	5.21T
Average seed price/ton		£20.8		£19.3		£19.4
Average ware price/ton		£17.9		£16.8		£16.6
Average seed rate		19.6c		19.6c		19.4c
Average seed cost/ton		£16.75		£16.0		£15.8
Average fertiliser rate		9.0c		9.1c		9.5c
units of N		119		124		123
P		115		122		123
K		168		176		180
Average hours - cas. lab.	56		74		58	
reg. lab.	86	142	56	130	50	108
tractor		30		30		27
Number of crops		15		55		15
Total acreage		172		465		111
Average acreage		11.5		8.5		7.4

TABLE X

Average Results per Acre - Ware Crops 1966

	Best 10		Average		Worst 10	
	£	£	£	£	£	£
<u>Output</u>						
seed - sold (uncert.)	11.7		6.7		5.4	
retained	14.9	26.6	10.6	17.3	5.5	10.9
ware - sold	215.0		149.7		91.3	
retained	2.4	217.4	2.6	152.3	2.2	93.5
brock		1.8		2.2		2.2
Total output		245.8		171.8		106.6
<u>Variable costs</u>						
seed		22.5		19.4		17.0
fertiliser		11.0		10.9		10.3
casual labour incl. transport		18.0		16.5		16.9
contract		2.8		3.7		1.6
fuel excl. tractor		.2		.2		.1
sundry - P.M.B. levy	3.0		3.0		3.0	
straw	2.3		1.2		.7	
sprays etc.	1.2	6.5	1.7	5.9	1.7	5.4
Total variable costs		61.0		56.6		51.3
Gross margin		184.8		115.2		55.3
<u>Fixed costs</u>						
regular labour		16.6		17.8		17.4
tractor deprec. etc.		6.4		6.3		6.1
specialised equipment depreciation etc.		7.7		7.2		6.1
rent		6.0		5.5		6.1
overheads		21.5		21.3		21.0
Total fixed costs		58.2		58.1		56.7
Total costs		119.2		114.7		108.0
Estimated profit or loss		126.6		57.1		-1.4
Average yields - seed (tons per acre) ware	1.10		.80		.52	
brock	9.53		7.16		4.99	
	.80	11.43T	.94	8.90T	1.12	6.63T
Average seed price/ton		£24.2		£21.6		£21.0
Average ware price/ton		£22.9		£21.3		£18.7
Average seed rate		21.2c		19.1c		17.9c
Average seed cost/ton		£21.2		£20.4		£19.0
Average fertiliser rate		9.5c		8.8c		8.6c
units of N		120		123		120
P		118		127		132
K		183		177		181
Average hours - cas. lab.	71		66		73	
reg. lab.	55	126	57	123	56	129
tractor		28		28		27
Number of crops		10		39		10
Total acreage		85.5		350		89.5
Average acreage		8.6		9.0		9.0

In a number of cases on the larger holdings, 2 planters or harvesters were required in order to get through the work in time, with the result that economies of scale which might have been expected, were not in fact realised.

The period of sale had some effect on results in both years but tended to either augment or detract from otherwise basically sound or doubtful enterprises, rather than being the main cause of success or failure.

There was no guarantee that crops would be consistently better or worse on the same farms from year to year. In fact there was considerable variation in the success of individual crops in the same year and also between years, although they were grown on the same farm. In general, there remains a greater chance of success on the better farms, although failure cannot be ruled out from time to time. In the survey, better farms in practice generally meant the larger ones, but there is no reason why a small farm on good land should not produce above average crops.

In conclusion, it should be remembered that the average figures include all systems of production and therefore should not be used in the preparation of budgets, with the possible exception of the yields and seed rates of the individual varieties as given in Appendix C. Suitable data for forward planning have been grouped together in the management appendix.

CONCLUSIONS AND SUMMARY

The results obtained during the survey have clearly shown the wide variations possible in the costs and returns from the enterprise. The figures indicate that average costs tended to remain relatively stable apart from expenditure on seed and to a lesser extent casual labour. In most cases there was little opportunity for significant savings to be made, nor were economies of scale necessarily realised. Labour remained the greatest problem on most farms. The harvesting peak could be eased by full mechanisation but the introduction of a harvester usually resulted in slower rates of work. (In many cases this alternative is not feasible with the harvesters at present available, as much depends on the nature of the soil and the lie of the land if the machines are to work satisfactorily.)

The level of yield obtained appeared to be the principle reason for success or failure in producing the crop, indicating the need for good husbandry and careful handling at all stages of production. The choice of variety could be important, Pentland Dell doing particularly well in 1966, although future returns must almost inevitably fall now that the variety is being more widely grown. Arran Pilot was a notable failure among seed crops in 1965, but improved considerably in 1966. The period of sale also had some effect, particularly in 1965, but again was of secondary importance compared with yield. In general the trend in prices over the season is by no means certain from year to year, the best time to sell usually only becoming obvious in retrospect.

The emphasis on yield adds weight to the trend in recent years for production to be concentrated on the larger holdings, many of which tend to be situated on the better land. In face of this tendency, it seems likely that more of the small to medium sized producers will give up potatoes because of labour difficulties and/or lack of yields.

There is a danger that the trend towards production on the larger holdings, coupled with the increasing use of the newer high yielding

varieties such as Pentland Dell and Record, might result in oversupply and could lead to a contraction in the total acreage grown. It is difficult to estimate what demand will be in a few years time but it seems unlikely that there will be any marked expansion in total consumption, although there will probably be a greater emphasis on manufactured products. The demand will undoubtedly be for quality potatoes and greater attention will have to be given to choice of variety, handling and presentation in order to provide what is required.

The future of the seed trade is closely linked with the fortunes of the ware market. The greater use of once-grown seed coupled with improved disease resistance and/or improved preventative measures and the increased competition from Northern Ireland and the Isle of Man constitute a challenge to Scottish seed production. It is likely that trade will tend to contract rather than expand unless new markets can be opened up for exports. Again the emphasis will be on producing a better product, aiming at the higher grades of seed and exploiting promising new varieties to help counter the lower yields often associated with seed production.

Finally, it can be said that provided yields are satisfactory, the crop can be a valuable source of income, despite the high costs of production and the extra care necessary in handling the crop. It should be remembered that failures do occur even on the best of land, due to circumstances beyond the control of the farmer. Some crops produced very good returns per acre during 1966, but due to the relatively small acreages involved in many cases, the boost to total farm income was not nearly so marked as the figures might suggest. Potatoes are a cash crop and there is no doubt that returns from the enterprise went through a bad spell during 1965 as shown by the average incomes on farms in the east of Scotland during this period. The general level of returns left little in the way of funds for reinvestment, with the result that the occasional very good year for potatoes should be viewed in perspective.

Summary of Average Results per Acre/

Summary of Average Results per Acre

Number of farms - 1965		63)	Some farms grew both	
1966		53)	seed and ware crops	
	Seed Crops		Ware Crops	
	1965	1966 ¹	1965	1966
Number of crops ²	71	55	55	39
Total acreage	795	566	465	350
Average acreage	11.2	10.3	8.5	9.0
<u>Average yield³</u>	tons	tons	tons	tons
seed	5.08	6.29	.84	.80
ware	3.22	3.46	6.84	7.16
brock	.93	.79	.77	.94
Total yield	9.23	10.54	8.45	8.90
<u>Average prices per ton</u>	£	£	£	£
seed	16.35	23.5	19.3	21.6
ware	15.1	19.2	16.8	21.3
Total output	133.5	216.4	133.0	171.8
Variable costs	61.8	75.7	53.4	56.6
Gross margin	71.7	140.7	79.6	115.2
Fixed costs	53.8	56.6	57.9	58.1
Total costs	115.6	132.3	111.3	114.7
Estimated profit	17.9	84.1	21.7	57.1

Notes:-

- 1 The per acre figures are somewhat inflated by the inclusion of 5 crops of Pentland Dell, which had particularly good results.
- 2 An additional 8 crops were never lifted in 1965, resulting in average losses of over £70 per acre.
- 3 The lower yields shown for the ware group are partly associated with crops of Golden Wonder and to a lesser extent Kerr's Pink. Excluding these, the average yields were 10.14 tons and 9.95 tons per acre in 1965 and 1966 respectively.

ACKNOWLEDGMENTS

Grateful acknowledgments are due to the farmers for their help and co-operation in providing the data for the survey, to the Potato Marketing Board and the Department of Agriculture for Scotland for statistical data and to my colleagues for help and advice in the preparation of this report.

APPENDIX A

COSTING METHOD

The figures have been split into variable and fixed costs. The variable costs are specific to the potato crop, increasing or decreasing in direct proportion to the acreage grown. Fixed costs include those items which are of a general nature and are therefore not readily allocated to any one enterprise. Fixed costs remain relatively stable during minor changes of farm policy.

Seed

Purchased seed has been charged at cost, including haulage. Home-grown seed has been charged at market value.

Fertilisers

Fertilisers have been charged at cost, including haulage. No allowance has been made for manurial residues and no value has been included for any dung applied, although carting and spreading have been charged where appropriate.

Casual Labour and Contract Work

Charged at the rates paid. Hand planting, roguing, lifting and dressing on a 'contract' basis have been included as casual labour.

Regular Labour

Regular labour has been charged at the rates operating on the individual farms, including insurance and allowances for perquisites and holidays. Manual work by the farmer has been charged at the farm rate. Where no regular labour was employed, an hourly rate based on around £12 per week has been used.

Tractor

Tractor work has been charged at 4s.6d. per hour for wheeled tractors and 13s.6d. per hour for crawlers.

Depreciation and Repairs

Specialised implements have been charged at 20% of the purchase price, electrical equipment at 15% and new buildings or conversions at 5%, spread over the total potato acreage.

Rent

Rent has been charged at the rate in operation, or at a figure agreed with the owner-occupier.

Overheads

Overheads include such items as general repairs, depreciation of tenants' fixtures and general implements, rates, insurances, light, power, car and office expenditure. The overhead allowances have been calculated on the following basis:-

	s.	d.
Per acre	14	3
Per £ labour	7	-
Per tractor hour	6	3

APPENDIX B

Acreages by Variety Planted by Registered Producers

	Thousands of Acres							
	Angus		Perth		Fife & Kinross		Lothians ¹ / Borders	
	1965	1966	1965	1966	1965	1966	1965	1966
First Early	3.5	2.3	3.3	2.1	1.8	1.0	1.9	1.2
Second Early	1.1	1.1	.5	.7	.6	.6	.9	.7
<u>Maincrop</u>								
King Edward ²	3.3	2.3	3.7	2.7	1.1	.7	1.4	.7
Golden Wonder	.4	.5	.6	.7	1.6	1.7	.7	.7
Kerr's Pink	1.1	.7	1.6	1.4	2.1	1.4	1.3	.8
Redskin	2.6	2.9	1.7	2.1	7.4	7.8	6.8	6.6
Majestic	11.4	9.0	7.8	5.7	4.3	3.0	2.9	2.4
Dr. MacIntosh	.4	.3	.4	.2	.2	.1	.2	.1
Record	1.1	1.5	.5	.7	1.4 ₃	1.6	1.9 ₃	1.6 ₃
P. Crown	.1	.4	.5	1.1	...	.1	...	...
P. Dell	.3	.9	.2	.6	.2	.4	.2	.9
Others	.7	1.0	.3	.5	.1	.1	1.4	1.1
Total	21.4	19.5	17.3	15.7	18.4	16.9	16.8	14.9
Total - all var.	26.0	22.9	21.1	18.5	20.8	18.5	19.6	16.8
	Scotland				Great Britain			
	1962	1964	1966	1967 ⁴	1962	1964	1966	1967 ⁴
First Early	22.2	23.3	13.0	16.8	102.4	110.4	77.0	105.2
Second Early	6.7	5.4	4.5		32.5	37.7	35.7	
<u>Maincrop</u>								
King Edward ²	16.2	15.3	9.7	9.0	139.6	125.7	104.2	102.0
Golden Wonder	5.3	5.2	5.3	5.4	5.4	5.3	5.5	5.6
Kerr's Pink	20.5	17.2	12.3	11.6	20.9	17.6	12.5	11.8
Redskin	22.5	22.5	24.3	25.9	33.6	31.4	29.4	30.1
Majestic	29.5	34.9	26.7	20.4	248.9	267.2	232.0	214.6
Dr. MacIntosh	1.4	2.5	.9	.7	12.6	16.0	10.7	8.2
Record	3.0	7.9	6.2	8.1	10.0	25.4	24.3	27.6
P. Crown	n.a.	(.8) ⁵	1.9	4.4	n.a.	(7.2) ⁵	16.1	33.1
P. Dell	n.a.	(1.6) ⁵	4.3	10.8	n.a.	(3.8) ⁵	15.5	51.1
Others	4.1	5.9	4.9	4.7	19.3	30.4	22.8	24.2
Total	102.5	111.4	96.5	101.0	490.3	519.0	473.0	508.3
Total - all var.	131.4	140.1	114.0	117.8	625.2	667.1	585.7	613.5

1 Includes Berwick, Roxburgh, Selkirk and Peebles. Approximately 65% in Lothians.

2 Includes Red King.

3 ... Less than 50 acres.

4 Provisional figures.

5 Figures for 1965.

Acreages Certified in Scotland - Seed Potatoes

	1962			1964			1966		
	F.S.	S.S.	A.	F.S.	S.S.	A.	F.S.	S.S.	A.
<u>Immune varieties</u>									
Majestic	1,236	652	20,108	1,865	1,157	27,192	2,438	1,437	16,716
A. Pilot	318	122	5,830	389	139	6,655	142	50	1,447
Redskin	215	339	3,912	237	198	4,285	471	227	3,210
Record	103	135	1,996	233	117	4,807	285	104	3,006
H. Guard	62	106	1,745	117	108	2,499	140	57	1,241
K. Pink	287	193	2,111	276	122	1,809	244	182	1,091
Dr. MacIntosh	88	15	933	199	83	1,985	39	14	521
R. C. Royal ¹	126	496	2,899	130	152	2,338	167	25	1,715
P. Dell	15	-	1	348	50	131	1,635	273	2,023
P. Beauty	105	15	32	37	28	422	79	8	345
A. Consul	-	11	168	4	29	305	-	15	218
G. Wonder	-	-	188	-	-	87	-	1	78
Ul. Chieftain	10	-	327	-	5	329	-	20	179
P. Crown	6	-	49	37	-	233	457	34	979
Others	94	63	1,813	158	136	1,662	68	97	1,375
Total	2,665	2,147	42,112	4,030	2,324	54,739	6,165	2,544	34,144
<u>Non-immune varieties</u>									
K. Edward ²	254	1,045	12,726	194	799	12,000	171	251	2,656
K. Edward - P. C. F.	-	-	-	667	98	672	1,976	182	3,475
Up-to-Date	4	214	816	21	212	943	183	141	534
Epicure	-	93	791	-	67	619	-	35	284
Royal Kidney	-	43	631	-	24	374	-	23	359
Sharp's Express	15	2	235	-	8	319	15	3	250
Others	17	15	510	42	41	400	3	15	270
Total	290	1,412	15,709	924	1,249	15,327	2,348	650	7,828
Total - all varieties	2,955	3,559	57,821	4,954	3,573	70,066	8,513	3,194	41,972

1 Includes Craig Royal.

2 Includes Red King.

Source: Department of Agriculture and Fisheries for Scotland.

Acreage Planted by Registered Producers According to Acreage

Size Group

Size group - acres	.01-9.99		10-29.99		30-49.99		Over 50		-	
	Thousands of Producers/Acres									
	Prod- ucers	Acres	Prod- ucers	Acres	Prod- ucers	Acres	Prod- ucers	Acres	Un- ¹ spec. acres	
England & Wales										
1956	42.2	136.3	11.1	178.7	2.1	78.0	1.7	164.0	28.9	
1959	39.3	131.9	10.4	167.1	2.1	77.8	1.5	148.1	11.0	
1962	32.7	112.5	9.5	154.2	1.9	72.8	1.6	146.6	7.6	
1965	26.2	96.9	9.6	155.5	2.3	84.9	1.8	169.6	9.2	
Scotland										
1956	10.1	29.7	2.5	40.4	.7	25.6	.4	32.4	18.1	
1959	9.6	28.3	2.4	39.6	.7	24.5	.4	40.5	2.0	
1962	8.1	23.1	2.1	36.3	.7	25.0	.5	44.4	2.7	
1965	6.2	18.7	2.1	35.4	.7	27.7	.5	48.4	2.6	
1965 - East of Scotland Counties	1.8	6.6	1.2	20.7	.5	19.8	.4	39.1	1.3	
Counties 1965	Producers/Acres									
Angus	383	1452	289	5328	149	5843	116	12992	285	
Perth	585	2140	291	4714	92	3452	85	10330	444	
Kinross	43	183	35	643	14	517	11	727	-	
Fife	262	1082	277	5073	129	4814	91	7457	304	
W. Lothian	121	431	41	616	16	605	10	624	34	
Midlothian	72	270	64	1125	28	1027	11	803	115	
E. Lothian	76	206	71	1245	43	1704	51	4060	55	
Berwick	133	469	75	1250	30	1145	16	1124	2	
Roxburgh	100	273	37	621	18	675	15	937	24	
Selkirk	11	17	-	-	-	-	-	-	3	
Peebles	22	40	7	98	-	-	1	60	2	

1 Balancing factor, representing acreage returns not made at date of compilation of each season's figures.

Estimates of Production and Utilisation of the Potato Crop

	1962		1964		1965	
	Scot.	G.B.	Scot.	G.B.	Scot.	G.B.
PRODUCTION						
Acreage ('000 acres)	142	660	153	706	142	680
Yield (tons per acre)	8.8	9.1	8.7	9.1	8.7	10.2
Production ('000 tons)	1249	6013	1326	6411	1228	6954
Surplus (+)/Imports (-) ¹ ('000 tons)	-	(-)188	-	(+)441	-	(+)575 ²
Average producers' price per ton	-	£18.05	-	£14.05	-	£14.20
Guaranteed price per ton	-	£13.25	-	£14.00	-	£14.25
UTILISATION ('000 tons)						
<u>Seed</u>						
Scottish farms	188	) 661	179	) 640	154	) 585
English/Welsh farms	264	)	241	)	188)
Scottish allotments	2	) 52	2	) 52	2	) 52
Eng./Welsh allotments	47	)	47	)	47)
Export	15	15	11	11	14	15
<u>Human Consumption</u>						
In Great Britain	551	4040	527 ³	4302 ⁴	458 ³	4482 ⁵
Unrecorded sales (est.)	40	200	40	200	40	200
Export	1	5	... ⁶	2	25	70
<u>Board Operations</u>						
Stockfeed (raw)	-	-	65	168	97	424
Stockfeed (processed)	-	-	-	10	-	11
Export	-	-	-	37	-	45
Compensation	-	-	40	225	-	95
Riddle effect (under 1½" & top - est.)	-	20	-	235	2	330
<u>Other Disappearance</u>						
Chats, loss through shrinkage and wastage in store, stockfeed outside Board operations, etc.	141	1020	174	529	201	645
Total utilisation	1249	6013	1326	6411	1228	6954

1 (+) Net amounts of surplus ware, bought under Guarantee arrangements and sold, or disposed of, for uses other than human consumption or on which compensation was paid. (-) Indicates the extent of the shortage of G.B. maincrop supplies.

2 Provisional.

3 Includes 4000 tons sold by the Board.

4 Includes 56000 tons sold by the Board.

5 Includes 166000 tons sold by the Board.

6 ... less than 500 tons.

APPENDIX C

Average Results per Acre - Seed Crops

	Farms growing:					
	under 10 acres		10-30 acres		over 30 acres	
	1965	1966	1965	1966	1965	1966
	£	£	£	£	£	£
<u>Output</u>						
seed	56.0	104.3	78.3	132.5	90.5	166.0
ware	35.2	42.5	45.8	77.6	52.7	63.8
brock	1.4	1.7	1.8	1.2	2.0	2.0
Total output	92.6	148.5	125.9	211.3	145.2	231.8
<u>Variable costs</u>						
seed	19.4	20.1	21.5	28.9	21.0	30.9
fertiliser	8.4	10.0	8.8	10.5	9.5	10.2
casual labour	25.0	26.1	19.3	25.1	22.1	25.7
contract	1.1	2.2	2.5	2.1	3.7	4.3
fuel	-	-	.1	.1	.1	.2
sundry	7.2	9.9	6.9	5.4	7.6	7.2
Total variable costs	61.1	68.3	59.1	72.1	64.0	78.5
Gross margin	31.5	80.2	66.8	139.2	81.2	153.3
<u>Fixed costs</u>						
regular labour	9.2	12.8	14.3	15.3	14.9	15.3
tractor	5.8	7.1	7.0	7.2	6.0	6.0
depreciation	5.9	3.7	5.6	6.4	6.8	7.5
rent	4.5	4.4	5.0	5.0	5.2	5.2
overheads	20.8	23.7	22.5	24.1	22.0	23.0
Total fixed costs	46.2	51.7	54.4	58.0	54.9	57.0
Total costs	107.3	120.0	113.5	130.1	118.9	135.5
Estimated profit/loss	-14.7	28.5	12.4	81.2	26.3	96.3
<u>Yield</u>	tons	tons	tons	tons	tons	tons
seed	3.75	4.78	4.48	6.09	5.49	6.60
ware	2.49	2.29	3.08	4.16	3.58	3.49
brock	.51	.79	.92	.59	1.05	.87
Total yield	6.75	7.86	8.48	10.84	10.12	10.96
Number of crops	8	7	24	13	40	35
Total acreage	37	46	206	142	556	378
Average acreage	4.7	6.6	8.6	10.9	13.9	10.8

Average Results per Acre - Seed Crops

	Angus/Perth		Fife/Kinross		Lothians ¹	
	1965	1966	1965	1966	1965	1966
	£	£	£	£	£	£
<u>Output</u>						
seed	77.6	145.6	91.6	156.5	99.4	141.1
ware	48.8	60.2	50.7	73.7	37.6	88.6
brock	2.0	1.9	1.1	1.2	2.8	2.3
Total output	128.4	207.7	143.4	231.4	139.8	232.0
<u>Variable costs</u>						
seed	21.6	27.0	20.5	32.9	16.3	31.8
fertiliser	8.8	9.7	9.8	11.3	9.9	10.3
casual labour	21.8	25.4	21.0	22.6	18.1	34.3
contract	1.9	2.5	4.5	4.5	8.0	7.4
fuel	.1	.2	.1	.2	.3	.2
sundry	7.1	7.6	7.9	6.4	5.9	8.0
Total variable costs	61.3	72.4	63.8	77.9	58.5	92.0
Gross margin	67.1	135.3	79.6	153.5	81.3	140.0
<u>Fixed costs</u>						
regular labour	13.5	14.1	14.0	15.4	20.1	19.4
tractor	5.9	6.2	6.9	7.1	7.6	6.2
depreciation	6.0	6.3	5.8	7.4	11.0	8.5
rent	4.6	4.5	6.2	6.4	4.3	4.6
overheads	21.5	22.8	22.5	23.8	24.6	26.4
Total fixed costs	51.5	53.9	55.4	60.1	67.6	65.1
Total costs	112.8	126.3	119.2	138.0	126.1	157.1
Estimated profit	15.6	81.4	24.2	93.4	13.7	74.9
<u>Yield</u>	tons	tons	tons	tons	tons	tons
seed	4.81	6.32	5.68	6.15	5.52	6.47
ware	3.32	3.16	3.27	3.77	2.22	4.56
brock	1.04	.83	.54	.59	1.41	1.19
Total yield	9.17	10.31	9.49	10.51	9.15	12.22
Number of crops	46	35	20	15	5	5
Total acreage	552	410	173	121	69	35
Average acreage	12.0	11.7	8.7	8.1	13.8	7.0

1 Less value can be attached to these figures due to the small sample. The 1965 figures include two crops lifted by harvester, which affected the labour and depreciation charges. The 1966 figures include two crops of Record and one of Pentland Dell.

Average Outputs, Variable Costs and Gross Margins per Acre - Seed Crops

	Majestic			King Edward		
	1965	1966	1967	1965	1966	1967
	£	£	£	£	£	£
<u>Output</u>						
seed	74.9	126.4		71.5	146.2	
ware	57.4	58.5		49.7	64.0	
brock	1.3	2.2		1.9	1.3	
Total output	133.6	187.1	-	123.1	211.5	-
<u>Variable costs</u>						
seed	24.7	26.6	32.5	19.3	20.4	31.9
fertiliser	9.0	10.3	10.6	10.3	9.3	10.1
casual labour	23.5	26.3		16.9	21.1	
contract	1.9	2.1		4.6	6.5	
fuel	.1	.1		.1	.1	
sundry	6.9	7.5		9.7	5.7	
Total variable costs	66.1	72.9	-	60.9	63.1	-
Gross margin	67.5	114.2	-	62.2	148.4	-
<u>Yield</u>	tons	tons	tons	tons	tons	tons
seed	5.0	6.1		5.0	6.5	
ware	3.8	3.1		3.3	3.2	
brock	.7	.9		.9	.8	
Total yield	9.5	10.1	-	9.2	10.5	-
<u>Price/ton</u>	£	£	£	£	£	£
seed	15.0	20.7	-	14.3	22.5	-
ware	15.1	18.9	-	15.1	20.0	-
Seed cost/ton	15.5	16.7	21.2	15.8	15.9	22.6
Seed rate	31.9c	31.9c	30.6c	24.3c	25.6c	28.3c
Number of crops	31	23	18	11	8	5
Total acreage	371	263	199	180	121	118
Average acreage	12.0	11.4	11.1	16.4	15.1	23.7

Average Outputs, Variable Costs and Gross Margins per Acre - Seed Crops

	Record			Redskin		
	1965	1966	1967	1965	1966	1967
	£	£	£	£	£	£
<u>Output</u>						
seed	117.1	129.8		91.6	114.6	
ware	49.8	100.5		61.3	93.1	
brock	1.8	1.1		1.4	2.3	
Total output	168.7	231.4	-	154.3	210.0	-
<u>Variable costs</u>						
seed	15.9	27.4	31.7	16.8	29.2	35.1
fertiliser	10.8	11.7	10.8	8.0	10.0	11.3
casual labour	23.4	24.9		11.3	24.8	
contract	5.4	2.9		4.5	4.9	
fuel	.2	.1		.1	.2	
sundry	5.0	8.8		5.6	6.4	
Total variable costs	60.7	75.8	-	46.3	75.5	-
Gross margin	108.0	155.6	-	108.0	134.5	-
<u>Yield</u>	tons	tons	tons	tons	tons	tons
seed	6.3	6.6		4.6	4.9	
ware	3.3	5.4		3.2	4.3	
brock	.9	.5		.7	1.2	
Total yield	10.5	12.5	-	8.5	10.4	-
<u>Price/ton</u>	£	£	£	£	£	£
seed	18.6	19.7	-	19.9	23.4	-
ware	15.1	18.6	-	19.1	21.7	-
Seed cost/ton	12.5	21.4	24.4	15.5	25.6	30.3
Seed rate	25.4c	25.6c	26.1c	21.7c	22.8c	23.3c
Number of crops	6	6	6	5	6	4
Total acreage	58	62	33	58	54	42
Average acreage	9.7	10.3	5.5	11.7	9.0	10.5

Average Outputs, Variable Costs and Gross Margins per Acre - Seed Crops

	Arran ¹ Pilot	Pentland Dell		Pentland Crown
	1965	1966	1967	1967
	£	£	£	£
<u>Output</u>				
seed	22.1	270.4		
ware	25.7	56.3		
brock	6.7	2.0		
Total output	54.5	328.7	-	-
<u>Variable costs</u>				
seed	16.7	52.9	57.7	68.8
fertiliser	8.5	10.5	9.4	10.2
casual labour	23.5	28.1		
contract	3.4	3.6		
fuel	.1	.2		
sundry	7.5	6.4		
Total variable costs	59.7	101.7	-	-
Gross margin	-5.2	227.0	-	-
<u>Yield</u>	tons	tons	tons	tons
seed	1.8	8.7		
ware	2.5	3.1		
brock	3.4	.8		
Total yield	7.7	12.6	-	-
<u>Price/ton</u>	£	£	£	£
seed	12.3	31.1	-	-
ware	10.2	18.1	-	-
Seed cost/ton	11.3	29.7	35.4	45.3
Seed rate	29.6c	35.7c	32.7c	30.4c
Number of crops	6	5	7	4
Total acreage	70	36	93	26
Average acreage	11.7	7.2	13.3	6.5

1 The 1965 season was a particularly bad year for this variety. Only the best seed was saleable, explaining the higher proportion of brock. Prices for 'A' seed were in the range £30-£40 per ton during the 1966-67 season.

Yields per Acre by Variety and by Size Group - Seed Crops

Variety	No. of cases ¹	Average yields			Distribution of yields per acre				
		total ²	seed	ware	3	3-6	6-9	9-12	12-15
		tons	tons	tons	tons	tons	tons	tons	tons
Majestic	34	9.5	5.0	3.7	-	3	11	15	5
	23	10.1	6.1	3.1	-	-	7	11	5
King Edward	11	9.2	5.0	3.3	1	2	2	3	2
	8	10.5	6.5	3.2	-	-	2	3	+1 >15T. 3
Record	6	10.5	6.3	3.3	-	-	1	4	1
	6	12.5	6.6	5.4	-	-	-	2	4
Redskin	5	8.5	4.6	3.2	-	1	2	2	-
	6	10.4	4.9	4.3	-	-	1	4	1
Pentland Dell	1	17.2	17.2	incl.	-	-	-	-	1 >15T.
	5	12.6	8.7	3.1	-	-	-	3	2
Home Guard	3	10.1	7.5	1.9	-	-	1	1	1
	2	9.2	7.8	.9	-	-	1	1	-
Kerr's Pink	5	6.1	2.9	6.1	-	4	-	1	-
	2	8.1	3.8	3.7	-	-	1	1	-
Dr. MacIntosh	1	4.9	3.5	.9	-	1	-	-	-
	1	12.4	7.4	4.8	-	-	-	-	1
Epicure	3	7.4	6.2	.7	-	2	-	-	1
	1	5.1	3.9	.9	-	1	-	-	-
Arran Pilot	6 ³	7.7	1.8	2.5	-	2	2	2	-
R.C. Royal	1 ³	11.2	8.3	2.3	-	-	-	1	-
Pentland Crown	1 ⁴	10.8	10.8	incl.	-	-	-	1	-
All crops - 1965	76 ⁵	9.1	4.9	3.2	1	15	19	29	10 +2 >15T.
All crops - 1966	55	10.5	6.3	3.5	-	1	12	26	16
<u>Farms Growing:</u>									
Under 10 acres	8	6.7	3.7	2.5	1	3	2	1	1
	7	7.9	4.8	2.3	-	-	4	3	-
10-20 acres	14	7.8	5.0	2.0	-	4	5	5	-
	6	9.9	5.4	4.0	-	-	4	-	2
20-30 acres	12	8.4	3.6	3.5	-	3	3	5	1
	7	11.6	6.6	4.3	-	-	-	5	2
30-40 acres	18	9.8	5.6	3.3	-	3	4	7	4
	20	10.1	6.0	3.2	-	1	4	11	4
40-50 acres	20	10.1	5.2	3.7	-	2	5	9	3 +1 >15T.
	9	12.1	7.3	3.7	-	-	-	5	4
Over 50 acres	4	12.3	6.9	4.6	-	-	-	2	1 +1 >15T.
	6	12.2	8.6	3.0	-	-	-	2	4

1 Upper figures relate to 1965; lower figures to 1966.

2 Includes brock.

3 Crops grown in 1965 only.

4 Crop grown in 1966 only.

5 Includes 5 crops in 1965 for which full data was not available.

Average Results per Acre - Ware Crops

	Farms growing:					
	under 10 acres		10-30 acres		over 30 acres	
	1965	1966	1965	1966	1965	1966
	£	£	£	£	£	£
<u>Output</u>						
seed	9.6	8.9	18.4	17.2	18.4	23.4
ware	99.6	144.8	114.6	145.6	122.9	168.3
brock	2.4	4.7	1.5	1.4	1.3	1.7
Total output	111.6	158.4	134.5	164.2	142.6	193.4
<u>Variable costs</u>						
seed	14.6	17.6	16.4	20.3	15.9	19.5
fertiliser	10.8	11.3	10.7	11.2	10.8	10.1
casual labour	15.2	17.3	18.3	13.8	15.0	20.1
contract	2.4	3.5	3.2	3.3	4.7	4.7
fuel	.1	.1	.2	.1	.1	.2
sundry	6.5	6.1	6.5	5.7	7.4	6.0
Total variable costs	49.6	55.9	55.3	54.4	53.9	60.6
Gross margin	62.0	102.5	79.2	109.8	88.7	132.8
<u>Fixed costs</u>						
regular labour	15.2	21.6	15.3	17.1	19.2	15.8
tractor	6.5	6.5	6.7	6.2	6.7	6.4
depreciation	2.6	2.1	8.5	9.8	8.3	7.3
rent	5.5	5.2	5.4	5.5	5.4	5.7
overheads	20.5	23.0	22.0	19.8	22.1	22.1
Total fixed costs	50.3	58.4	57.9	58.4	61.7	57.3
Total costs	99.9	114.3	113.2	112.8	115.6	117.9
Estimated profit	11.7	44.1	21.3	51.4	27.0	75.5
<u>Yield</u>	tons	tons	tons	tons	tons	tons
seed	.65	.47	.95	.82	.93	1.02
ware	5.90	6.66	6.42	7.10	7.58	7.65
brock	.95	1.57	.77	.70	.67	.82
Total yield	7.50	8.70	8.14	8.62	9.18	9.49
Number of crops	12	9	19	18	24	12
Total acreage	54	41	168	135	243	174
Average acreage	4.5	4.6	8.9	7.5	10.1	14.5

Average Results per Acre - Ware Crops

	Angus/Perth		Fife/Kinross		Lothians	
	1965	1966	1965	1966	1965	1966
	£	£	£	£	£	£
<u>Output</u>						
seed	10.0	28.3	22.0	15.0	12.2	12.2
ware	114.0	124.7	119.0	166.0	109.2	152.8
brock	1.7	2.1	1.0	1.8	2.7	3.1
Total output	125.7	155.1	142.0	182.8	124.1	168.1
<u>Variable costs</u>						
seed	14.1	18.0	16.4	19.3	16.2	20.7
fertiliser	10.5	9.8	10.7	11.5	11.2	10.7
casual labour	15.6	18.0	17.1	15.1	15.0	17.7
contract	4.2	1.7	2.8	3.3	4.7	5.9
fuel	.1	.1	.1	.2	.1	.2
sundry	8.7	5.5	6.3	5.7	6.2	6.4
Total variable costs	53.2	53.1	53.4	55.1	53.4	61.6
Gross margin	72.5	102.0	88.6	127.7	70.7	106.5
<u>Fixed costs</u>						
regular labour	19.0	16.7	15.7	17.2	17.1	19.3
tractor	6.5	5.9	6.7	6.6	6.7	6.1
depreciation	8.6	7.5	6.1	8.2	7.5	5.8
rent	5.2	5.5	6.0	5.9	4.7	4.8
overheads	22.1	20.9	21.8	21.0	21.3	21.9
Total fixed costs	61.4	56.5	56.3	58.9	57.3	57.9
Total costs	114.6	109.6	109.7	114.0	110.7	119.5
Estimated profit	11.1	45.5	32.3	68.8	13.4	48.6
<u>Yield</u>	tons	tons	tons	tons	tons	tons
seed	.57	1.24	1.16	.72	.60	.60
ware	6.69	5.12	7.07	8.20	6.57	7.15
brock	.86	1.00	.49	.86	1.17	1.00
Total yield	8.12	7.36	8.72	9.78	8.34	8.75
Number of crops	15	9	26	18	14	12
Total acreage	140	78	209	137	116	135
Average acreage	9.4	8.8	8.0	7.5	8.3	11.3

Average Outputs, Variable Costs and Gross Margins per Acre - Ware Crops

	Redskin			Kerr's Pink		
	1965	1966	1967	1965	1966	1967
	£	£	£	£	£	£
<u>Output</u>						
seed (uncertified)	18.5	17.2		10.2	16.3	
ware	124.4	151.0		99.2	126.5	
brock	1.5	2.5		2.1	3.0	
Total output	144.4	170.7	-	111.5	145.8	-
<u>Variable costs</u>						
seed	16.9	18.9	25.8	13.7	15.9	17.7
fertiliser	10.5	10.4	11.1	10.5	11.9	11.5
casual labour	16.9	17.0		17.7	14.1	
contract	3.7	3.4		3.8	2.8	
fuel	.1	.1		.1	.1	
sundry	6.5	5.2		8.3	7.1	
Total variable costs	54.6	55.0	-	54.1	51.9	-
Gross margin	89.8	115.7	-	57.4	93.9	-
<u>Yield</u>	tons	tons	tons	tons	tons	tons
seed	.9	.8		.6	.8	
ware	8.3	8.1		6.0	6.1	
brock	.8	1.2		1.0	1.0	
Total yield	10.0	10.1	-	7.6	7.9	-
<u>Price/ton</u>	£	£	£	£	£	£
seed	20.6	21.5	-	17.0	20.4	-
ware	15.5	18.6	-	16.5	20.7	-
Seed cost/ton	16.6	18.8	24.9	14.7	20.0	20.1
Seed rate	20.6c	20.1c	20.7c	18.7c	15.9c	17.6c
Number of crops	25	19	21	15	7	6
Total acreage	237	179	285	106	46	27
Average acreage	9.5	9.4	13.6	7.1	6.6	4.5

Average Outputs, Variable Costs and Gross Margins per Acre - Ware Crops

	Golden Wonder			Other Varieties		
	1965	1966	1967	1965	1966	1967
	£	£	£	£	£	£
<u>Output</u>						
seed (uncertified)	21.0	18.6		13.5	15.0	
ware	91.4	179.6		144.2	130.6	
brock	1.3	1.7		1.3	.7	
Total output	113.7	199.9	-	159.0	146.3	-
<u>Variable costs</u>						
seed	16.4	22.4	26.7	14.6	20.7	25.5
fertiliser	11.7	11.4	11.3	12.0	9.9	10.5
casual labour	14.2	18.6		11.0	12.4	
contract	2.6	2.4		5.2	12.5 ¹	
fuel	.1	.1		.1	.2	
sundry	6.2	7.2		6.9	3.2	
Total variable costs	51.2	62.1	-	49.8	58.9	-
Gross margin	62.5	137.8	-	109.2	87.4	-
<u>Yield</u>	tons	tons	tons	tons	tons	tons
seed	.9	.7		.9	.7	
ware	3.3	6.0		9.2	8.1	
brock	.4	.6		.6	.4	
Total yield	4.6	7.3	-	10.7	9.2	-
<u>Price/ton</u>	£	£	£	£	£	£
seed	23.3	26.6	-	15.0	21.4	-
ware	27.7	29.9	-	15.7	16.1	-
Seed cost/ton	18.4	24.5	27.2	14.2	18.6	23.5
Seed rate	17.8c	18.3c	19.6c	20.6c	22.7c	21.7c
Number of crops:						
Golden Wonder	10	10	9			
Record				2	2	7
King Edward				2	-	2
Arran Consul				1	1	3
Total acreage	76	73	75	46	52	221
Average acreage	7.6	7.3	8.4	9.2	17.3	18.4

1 Includes one crop lifted by complete harvester.

Yields per Acre, by Variety and by Size Group - Ware Crops

Variety	No. of cases ¹	Average yields			Distribution of yields per acre				
		total ²	seed	ware	3	3-6	6-9	9-12	12-15
		tons	tons	tons	tons	tons	tons	tons	tons
Redskin	25	10.0	.9	8.3	-	1	6	13	5
	19	10.1	.8	8.1	-	-	6	9	3 +1>15T.
Kerr's Pink	15	7.6	.6	6.0	1	2	7	5	-
	7	7.9	.8	6.1	-	2	3	2	-
Golden Wonder	10	4.6	.9	3.3	2	5	3	-	-
	10	7.3	.7	6.0	-	4	5	1	-
Record	2	13.8	.8	13.0	-	-	-	-	2
	2	8.9	.3	8.5	-	-	1	1	-
Arran Consul	1	10.7	2.7	6.8	-	-	-	1	-
	1	9.8	1.6	7.3	-	-	-	1	-
King Edward	2 ³	7.6	-	6.6	-	1	-	1	-
All crops - 1965	55	8.4	.8	6.8	3	9	16	20	7
All crops - 1966	39	8.9	.8	7.2	-	6	15	14	3 +1>15T.
<u>Farms Growing:</u>									
Under 10 acres	12	7.5	.6	5.9	1	2	3	6	-
	9	8.7	.5	6.7	-	-	5	3	1
10-20 acres	13	8.0	.8	6.3	1	2	5	3	2
	11	8.0	.8	6.4	-	3	5	3	-
20-30 acres	6	8.5	1.3	6.6	-	1	3	2	-
	7	9.6	.8	8.2	-	2	1	2	2
30-40 acres	10	7.7	1.5	5.8	1	1	5	3	-
	7	9.0	.8	7.5	-	1	3	2	1>15T.
40-50 acres	9	9.0	.5	7.4	-	3	-	4	2
	3	9.9	2.1	6.8	-	-	1	2	-
Over 50 acres	5	12.4	.6	11.3	-	-	-	2	3
	2	10.4	.3	9.4	-	-	-	2	-

- 1 Upper figures relate to 1965; lower figures to 1966.
- 2 Includes brock.
- 3 Crops grown in 1965.

APPENDIX D

FARM MANAGEMENT APPENDIX

This section contains additional information to assist in the preparation of budgets. Prices, rates of work and typical costs are included and two budget examples are given, based on these figures. Graphs have also been drawn to show the labour requirements in greater detail and to provide an indication of variable cash flows over the production year, associated with the two examples.

Wherever possible budgets should be based on local knowledge and experience, the figures given here being intended to fill in the gaps when such data is unobtainable. Seed rates and yields for individual varieties will be found in Appendix C, while planting and lifting data are given in greater detail in the report.

Guide to Depreciation Charges for Specialised Equipment

Implement	New Price	Annual ¹ charge	Charge per acre	
			30 acres	60 acres
	£	£	£	£
Triple driller + fert. box	90	22	.7	.35
Planters				
3 row automatic	310	75	2.5	1.25
3 row semi-automatic	200	48	1.6	.8
2 row automatic	200	48	1.6	.8
2 row semi-automatic	160	39	1.3	.65
3 row coverer	80	20	.67	.33
Pulveriser	200	48	1.6	.8
Diggers				
1 row spinner	100	24	.8	.4
1 row elevator	250	60	2.0	1.0
2 row elevator	300	72	2.4	1.2
Harvesters (4 year life)				
1 row	950	276	9.2	4.6
1 row	1300	377	12.6	6.3
2 row	1650	479	16.0	8.0
Elevators				
basic	300	72	2.4	1.2
incl. swinging head	500	120	4.0	2.0
unloading (for stores)	200	48	1.6	.8
Tipping mechanism to handle boxes	150	36	1.2	.6
30 boxes @ £5	150	36	1.2	.6
Scoop for fore-loader	40	9	.3	.2
Dressers				
small	300	72	2.4	1.2
large	500	120	4.0	2.0

1 Based on a life of 5 years with the exception of harvesters which have been written off in 4 years, the charges exclude any allowance for scrap values but include interest at 8% on half the capital cost.

Buildings - rough guide to costs before deduction of grant.

Space required - 56 cubic feet per ton.

Structural details - frame building with asbestos roof; 11" cavity walls with reinforcing piers between uprights, standing 14' to the eaves, concrete floor and sliding doors, simple electrical services.

	200 - 400 tons	£9	per ton stored
	400 - 600 tons	£8.5	per ton stored
	600 tons and over	£8	per ton stored
<u>add</u>	full insulation	£1.2	per ton stored
	underfloor main duct	£ .6	per ton stored
	triangular laterals	£ .6	per ton stored ¹

1 Not eligible for grant.

Buildings - Budget example for a building to store 360 tons.

(Assuming no special insulation or underfloor duct. Potatoes stored to 7'. Straw bales round walls, later reused for bedding.)

Structure @ £9 per ton	£3240
<u>less</u> grant (30%)	972
	<hr/>
	£2268
Triangular ducting @ £.6 per ton	216
	<hr/>
Total	£2484
	<hr/>
Annual charge over 10 years	248
<u>add</u> interest @ 8% on half the net cost	99
	<hr/>
Total annual charge	£347
	<hr/>
Annual charge per acre over 30 acres	£11.6

Guide to Rates of Work per 8 Hour Day

Operation	Team number	Tractor number	Approx. acreage per day
Dung handling	4	3	4.0
Ploughing (2 furrow)	1	1	2.9
Seed-bed cultivations (disc, cultivate, harrow)	1	1	5.3
Drill and apply fertiliser	1	1	6.1
drill only	1	1	8.0
apply fertiliser - spinner	1	1	13.3
Planting			
squad	16	-	7.0
closing	1	1	8.0
2 row semi-automatic (plant and close)	3	1	2.7
3 row automatic (plant and close)	2	1	5.0
Summer cultivations			
harrow	1	1	18.0
grub	1	1	8.0
ridge	1	1	8.0
Weed or blight spray	1	1	16.0
Pulverise	1	1	8.0
Lifting			
squad + 1 row elevator digger	26	3	2.7
harvester (£950)	8	3	1.5
Dressing (seed and ware)	6	-	Approx. tonnage per day 11-12T.
Chitting ¹ - stacking or turning seed	3	-	10T.

1 Derived from early potato survey.

Labour and Tractor Hours per Acre

Month	Operation	Typical hours	Typical team or tractor number	Range in hours
November-February	Dung handling - tractor	4-6	2-3	1.8-17.6
	regular labour	6-8	3-4	1.8-23.0
	Ploughing	2.8(2F)	1	.9- 5.2
April-May	Seed-bed cultivations (disc, cultivate, harrow)	1.5	1-2	.3- 6.0
	Drill and apply fertiliser	1.3	1	.5- 3.4
	drill only	1.0	1	.5- 2.0
	apply fertiliser - spinner	.6	1	.2- .7
	barrow	.9	1	.3- 1.8
	Carting seed and fertiliser - hand planting	1.3- 2.6	1-2	.2- 6.4
	machine planting	.7- 1.4	1-2	.2- 1.9
	Planting small squad	14	6	9.4-19.3
	larger squad	17	16	10.2-22.0
	2 row automatic tractor	2.3	1	1.1- 3.3
	regular labour	4.6	dr.	1.2-10.0
	2 row semi-automatic tractor	3.0	1	1.6- 4.5
	labour	9.0	dr. + 2	3.2-12.5
	3 row automatic tractor	1.6	1	.8- 3.3
	labour	3.2	dr. + 1	1.2- 6.7
3 row semi-automatic tractor	2.2	1	1.1- 3.4	
labour	8.8	dr. + 3	4.8-15.5	
Closing drills (after squads and 3 row planters in general)	1.0	1	.2- 2.0	
May-June	Summer cultivations	3.0	1	.3-10.6
	Weed spray (per application)	.5	1	.3- 1.3
July-August	Roguing	5.0	1-2	.2-11.0
	Blight spray (per application)	.5	1	.2- .6
August-September	Spraying down shaws	.5	1	.3- .9
	Pulverising	1.0	1	.4- 2.7
September-October	Lifting spinner - tractor + driver cas. labour*	4.2 50-63	1 12-15	2.0-10.7 30-238
	1 r. elv. - tractor + driver cas. labour*	3.0 60-72	1 20-24	2.0- 6.0 34-125
	2 r. elv. - tractor + driver cas. labour*	2.7 54-81	1 20-30	1.2- 5.6 32-80

* Approximate numbers and hours including basket-men.

Labour and Tractor Hours per Acre (Continued)

Month	Operation	Typical hours	Typical team or tractor number	Range in hours
September-October	1 r. harvester (£800-£1000) - tractor + driver casual labour	5.5 22-27.5	1 4-5	3.5- 7.6 14.0-38.0
	1 r. harvester (£1100-£1300) - tractor + driver casual labour	3.5 17.5	1 5	3.0- 4.4 6.0-26.5
	2 r. harvester (£1600) tractor + driver casual labour	- -	1 -	2.8- 4.2 14.8-22.5
	Carting off men and tractors	as for diggers/ harv.	2-3	2.8-13.5
	Store or pit	"	1-2	.9- 9.2
November	Winter-covering of pits - tractor labour	.5 1.0	1 2	.1- 1.9 .1- 7.6
October-May	Dressing - throughput of 10-13 ton of seed and ware per day	4.2/T.	5-7	1.2-11.5 per ton

Typical Costs per Acre

	Typical	Range
	£	£
Seed - Majestic, Pentland Crown and Pentland Dell for seed, 30-35c. other varieties for seed, 24-26c. Kerr's Pink for ware, 17-18c. other varieties for ware, 20-21c. (guide to prices on page 4)	- -	- -
Fertiliser - 8-9 cwt (100-110 units of N and P, 150-160 units of K) (F.Y.M. 12-14T. per acre where applied)	11-12	3.2-16.2
Casual labour (rates as at 4th September, 1967) rate per hour - women 4/2 0/T 6/- men 5/5 0/T 7/11 mixed squads 4/6 - 5/6 'contract' roguing 'contract' pickers transport - approx. £4.5 per day for a bus. merchants' dressing charges per ton of seed and ware (for planting and lifting, see appropriate sections)	1-2 18-20 1.2-1.6	.5- 3.1 15.0-21.0 .9- 4.0

Typical Costs per Acre (Continued)

	Typical	Range
	£	£
Contract work		
dung handling	5.5	3.9-8.2
machine planting	2.0-3.0	1.8-3.0
weed spray - contact (per application)	2.0-3.0	) 2.0-7.1
contact/residual mix. (" ")	5.2	
blight spray - ground (" ")	1.5	1.0-1.7
aerial (" ")	2.6	2.3-2.6
acid - half strength	2.5	1.5-2.6
full strength	3.2	2.5-4.2
pulverising	1.5	1.0-2.1
digger, tractor and man	£4-5	) rough) guide
harvester, tractor and 2 men	£4-5/hr.	
cart, tractor and man	£3/day	
pit covering	-	.5- .8
Sundry		
P.M.B. levy	3.0	
seed inspection fee	.75	
sealing fee (V.T., F.S. and S.S. only)	.45/T.	
weed spray - contact (per application)	2.0-3.0	) 2.0-5.7
contact/residual mix. (" ")	5.0	
blight spray (" ")	1.0	.7-1.4
spraying down shaws - diquat	2.5	1.5-2.6
chlorate	.8	.45- .9
baskets	.5	.1-2.5
bags (usually supplied by merchant)		
1 cwt jute 1/10d. each		
½ cwt paper 6d. each		
bunched wheat straw @ £8 per ton -		
per ton pitted (1 cwt per ton)	.4/T.	1.5-8.0 per acre
repairs to elevator digger	.7	) estimates
repairs to small harvester	1.5	
repairs to large harvester	2.0	
Regular labour		
rate per hour, including house, potatoes, employer's share of insurance and allowance for holidays - 7/2 0/T 7/11 (as at 4th September, 1967)		

Budget examples

<u>System A</u>		<u>System B</u>				
Hand plant		Machine plant				
Traditional weed control		Chemical weed control				
Hand lift		Complete harvester				
Pit storage		Shed storage				
Equipment and buildings required. (Depreciation spread over 30 acres.)						
	System A		System B			
	New price	Annual charge /acre	New price	Annual charge /acre		
	£	£	£	£		
Triple driller	-	-	90	.7		
3 row automatic planter	-	-	310	2.5		
3 row coverer	80	.7	-	-		
1 row elevator digger	250	2.0	-	-		
1 row harvester	-	-	950	9.2		
Scoop for store	-	-	40	.3		
Dresser	300	2.4	300	2.4		
Total (implements)	630	5.1	1690	15.1		
Storage shed	-	-	2484	11.6		
Total outlay	630	-	4174	-		
Annual charge	-	5.1	-	26.7		
Labour and tractor work per acre						
	System A			System B		
	Hours			Hours		
Operation	Regular labour	Casual labour	Tractor	Regular labour	Casual labour	Tractor
Dung handling	6.0(3)	-	4.0(2)	6.0(3)	-	4.0(2)
Ploughing	2.8	-	2.8	2.8	-	2.8
Seed-bed cult.	1.5	-	1.5	1.5	-	1.5
Drill + fert.	-	-	-	1.3	-	1.3
Drill	1.0	-	1.0	-	-	-
Fert. spinner	.6	-	.6	-	-	-
Carting	2.6(2)	-	2.6(2)	1.4(2)	-	1.4(2)
Planting	3.4(3)	13.6(12)	-	1.6	1.6	1.6
Closing	1.0	-	1.0	included with planter		
Cultivations	3.0	-	3.0	-	-	-
Weed spray	-	-	-	.5	-	.5
Blight spray	-	contract (twice)	-	1.0	(twice)	1.0
Roguing	-	@£1.5	-	-	-	-
Lifting	3.0	66.0(22)	3.0	5.5	22.0(4)	5.5
Carting	6.0(2)	-	6.0(2)	11.0(2)	-	11.0(2)
Pit or shed	3.0	-	-	5.5	-	5.5
Pit covering	1.0(2)	-	.5(1)	-	-	-
Dressing	Merchant @ £1.5/T.			25.2(4)	12.6(2)	-
Total	34.9	79.6	26.0	63.3	36.2	36.1
Rate per hour	7/2	4/6&4/9	4/6	7/2	4/2	4/6
Cost per acre	£12.5	£33.8	£5.9	£22.7	£7.5	£8.1

Team or tractor numbers shown in brackets.

	System A		System B	
	Seed crop Majestic 'A'		Ware crop Redskin	
	tons	£	tons	£
<u>Output</u>				
seed	5.5 @ £20	110.0	1.0 @ £20	20.0
ware	3.5 @ £16	56.0	8.0 @ £17	136.0
brock	.5 @ £2	1.0	1.0 @ £2	2.0
Total output	9.5	167.0	10.0	158.0
<u>Variable costs</u>				
seed	32c @ £22	35.2	20c @ £25	25.0
fertiliser	8c	11.0	8c	11.0
casual labour	£33.8		£7.5	
transport	<u>2.2</u>	36.0	-	7.5
contract - blight (twice)	£3.0		£-	
acid	<u>3.2</u>	6.2	<u>3.2</u>	3.2
fuel - dresser		-		.1
sundry - P.M.B. levy	£3.0		£3.0	
inspection fee	.8		-	
weed spray	-		5.0	
blight spray (twice)	-		2.0	
baskets	.5		-	
straw	3.8		-	
repairs to digger or harvester	<u>.7</u>	8.8	<u>1.5</u>	11.5
Total variable costs		97.2		58.3
Gross margin		69.8		99.7
<u>Other direct costs</u> ¹				
regular labour		12.5		22.7
tractor depreciation and fuel		5.9		8.1
depreciation of specialised equipment		5.1		26.7
Total - other direct costs		23.5		57.5

1 These costs are included to help complete the picture where the enterprise is being introduced to a farm system. Where the crop is already being grown, the fixed costs of the farm will include most of this expenditure and it will only be necessary to consider alterations resulting from changes in the present policy.

Note:-

The labour requirements for these examples are also shown on Graph III overleaf. Variable capital profiles have been prepared on Graph IV. These give an outline of the variable capital inputs on a month by month basis over the production year.

Graph III

Labour Requirements per Acre - Budget Examples

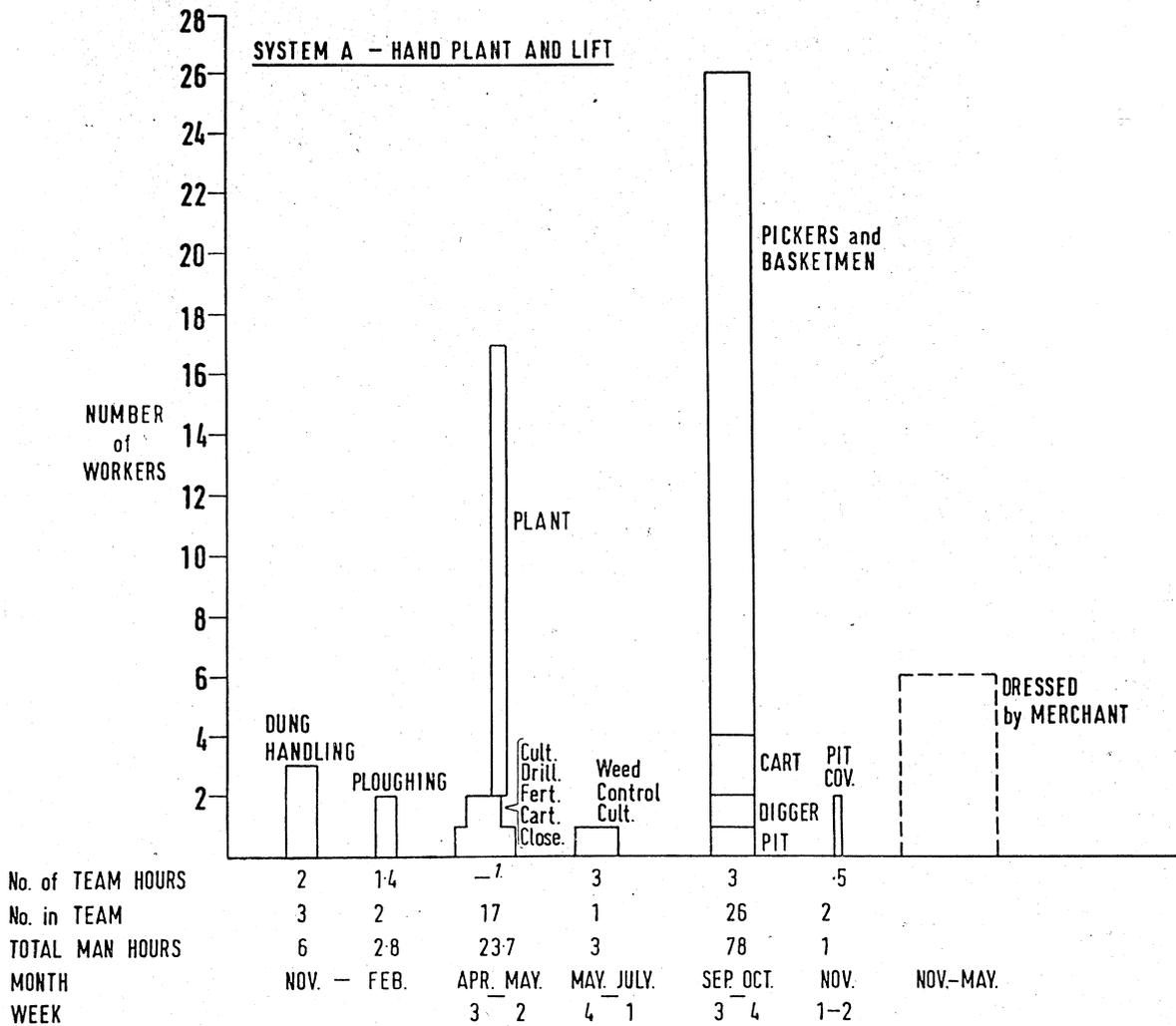
The labour requirements for the two budget examples are drawn on the graphs. These show the number of workers required for the various operations, indicate the length of time necessary for each task and give the approximate period during the year when the work has to be done. The vertical scale corresponds to the number of workers and the width of the columns to the time required to complete each job. (It should be noted that the graphs do not necessarily show the optimum team numbers for a given situation. Variations are possible, particularly where the planting sequence is concerned.) In general, the first few workers in each column will be regular staff. In most cases, they will be able to do all the work outwith the peak periods and handle at least the tractor work during the planting and lifting.

Planting represents the most complex series of operations as the various jobs of cultivating, drilling etc., take differing lengths of time and team numbers compared with other multiple operations such as lifting, where individual teams work a similar period to the digger or harvester. Planting operations can be staggered to allow a smaller farm staff to do the work, but this will tend to restrict the acreage which can be handled within a reasonable period of time. Lifting cannot be staggered, as the operation is tied to the principle job of digging the crop.

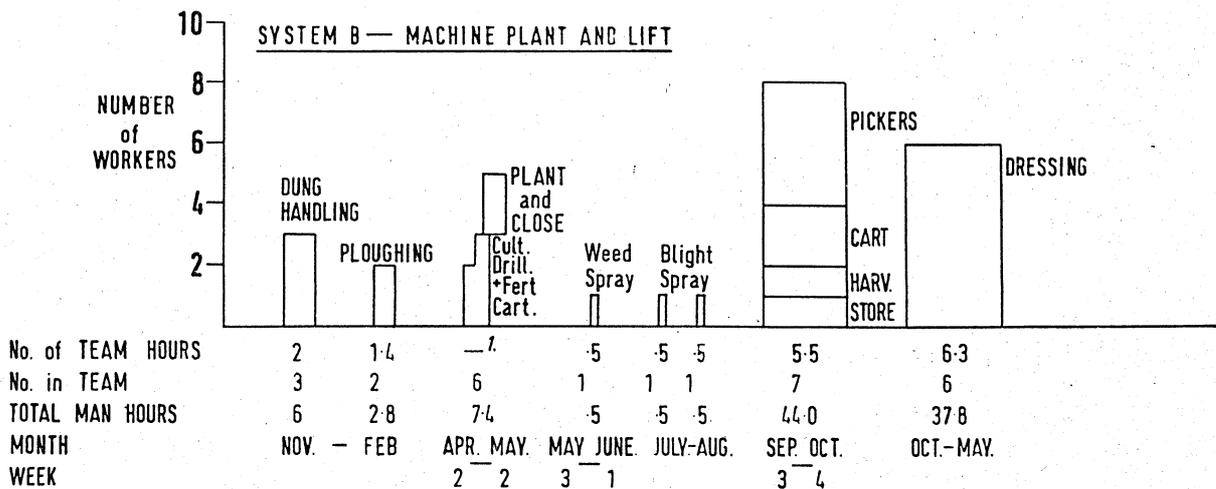
The main value of the graphs is to show the peak periods and to emphasise the effect of mechanisation on the planting and lifting operations. The rate of work is less critical in the spring but the marked reduction in the acreage throughput by the smaller harvesters while requiring the same regular team, is clearly shown. On the credit side, the team requirement has fallen from 26 to 8 when lifting by harvester.

GRAPH III

LABOUR REQUIREMENTS PER ACRE - BUDGET EXAMPLES.



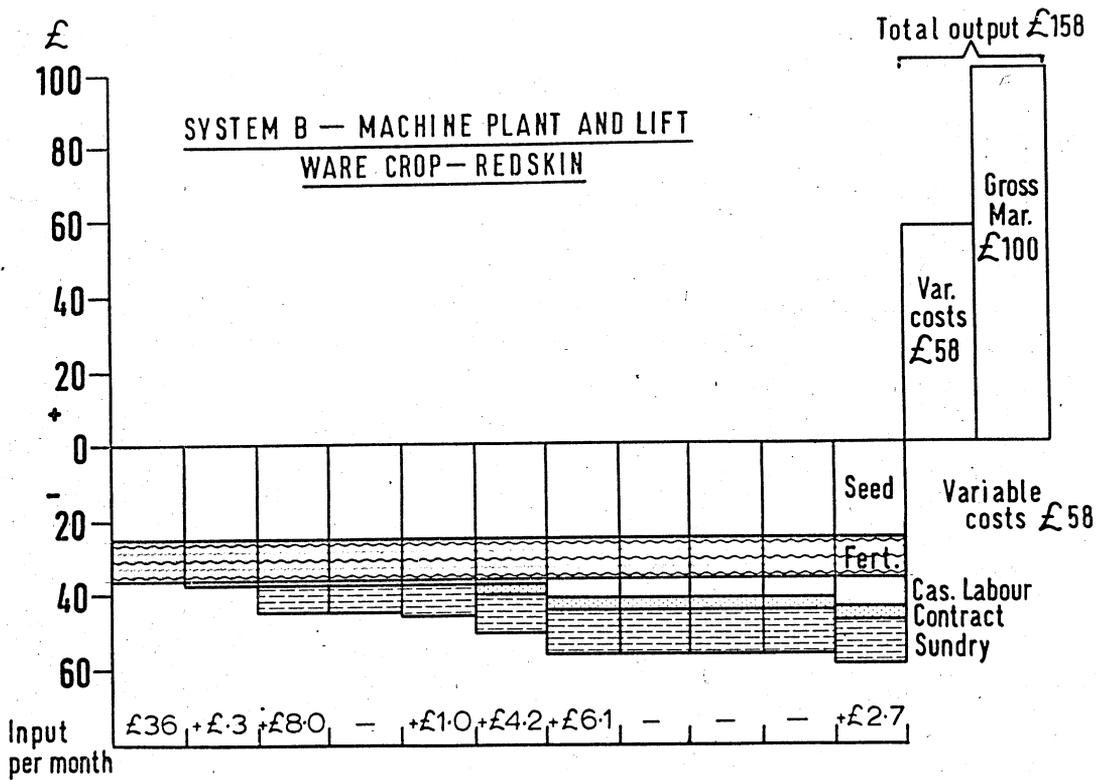
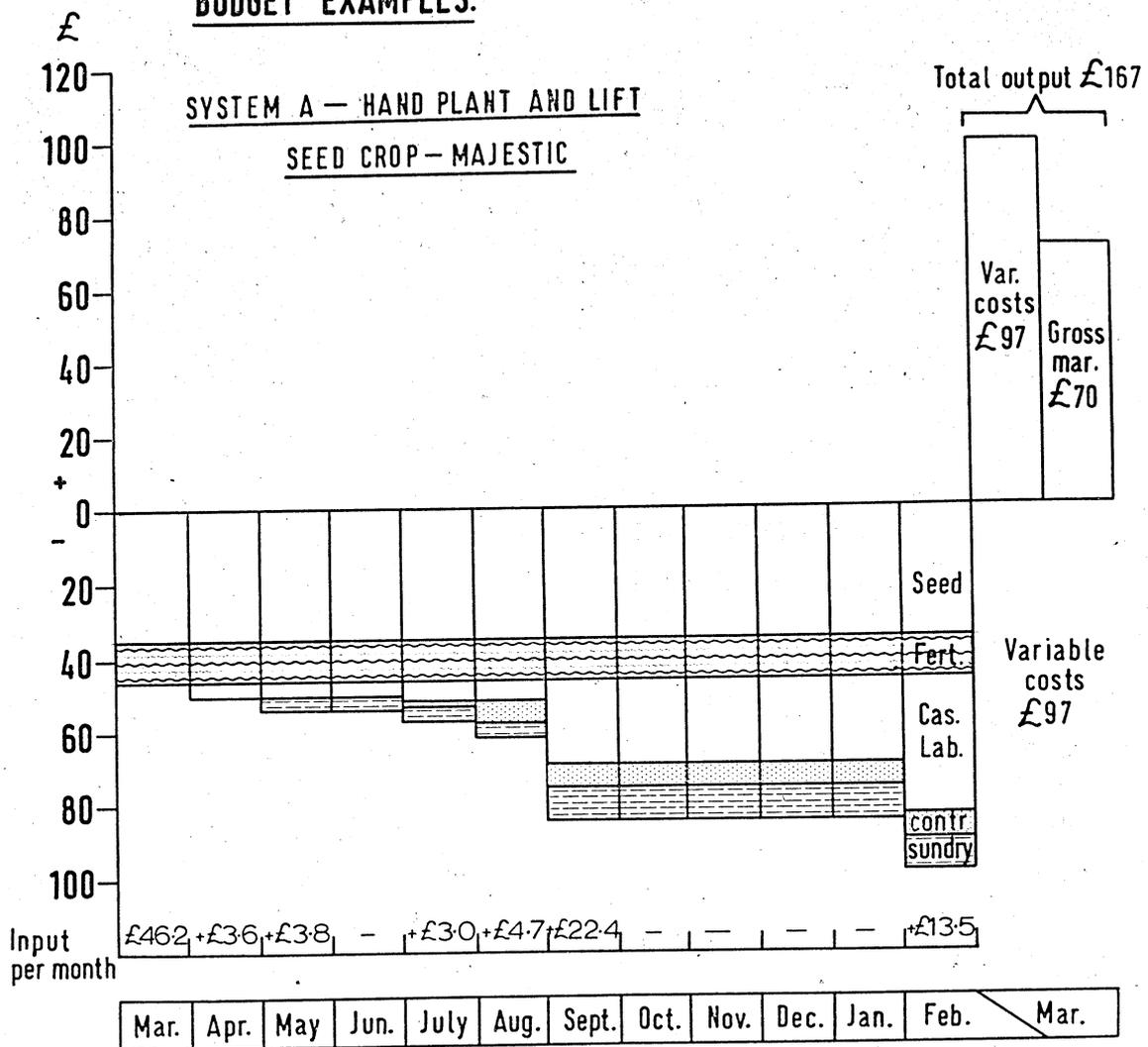
¹CULTIVATIONS 75 (2men), DRILL 1.0, FERT.(spinner) .6, CART 1.3(2men), PLANT 1.1(15 M.and W.), CLOSE 1.0.



¹CULTIVATIONS 75 (2men), DRILL and FERT 1.3, CART 7 (2men), PLANT and CLOSE 1.6(1M., 1W).

GRAPH IV

**CAPITAL PROFILES—VARIABLE COSTS AND RETURNS PER ACRE —
BUDGET EXAMPLES.**



N.B. Seed and fertiliser may be purchased earlier. Payment may be considerably delayed.

Graph IV

Variable Capital Profiles - Budget Examples

The graphs give an indication of the monthly inflow of variable capital required by each acre of the potato enterprise under the two systems chosen. Briefly these inputs can be summarised as follows:-

March-April	seed and fertiliser (possibly bought earlier)
+April-May	casual labour for planting
+May-June	P.M.B. levy, weed sprays
+July-August	blight sprays, burning down
+September-October	lifting expenses
+October-May	dressing expenses

Seed costs will vary most from year to year, but the general pattern will remain much the same. (Dressing expenses have been included in Graph IV to complete the picture. In practice, where a crop is dressed by a merchant, the dressing costs are generally deducted from the sales before payment is made.)

Other sources of capital are obviously required for potato production but such items (regular labour, rent, general expenses etc.), belong to the fixed or 'inescapable' costs associated with running the farm business. Most of these costs are likely to be incurred whether potatoes are grown or not and therefore little is gained by allocation to the various enterprises. Specialised equipment charges have also been excluded as once equipment is bought, the annual charges have to be met without regard to the actual potato acreage in any one year. Such costs do not increase or decrease in direct proportion to the acreage being grown.

APPENDIX E

STANDARD APPENDIX

The figures in this appendix are based on 71 records of seed crops covering 795 acres on 42 farms and 55 records of ware crops covering 465 acres on 37 farms during 1965. For the 1966 crop year, the figures are based on 55 records of seed crops covering 566 acres on 33 farms and 39 records of ware crops covering 350 acres on 29 farms. Some of the farms grew both seed and ware.

TABLE I

Summary of Average Costs per Acre										
Item of cost					Seed Crops		Ware Crops			
					1965	1966	1965	1966		
	Hours				£	£	£	£		
	Seed Crops		Ware Crops							
1965		1966		1965		1966				
Regular labour	46	48	56	57	14.1	14.9	17.0	17.8		
Casual labour	87	94	74	66	21.3	25.4	16.2	16.5		
Power - tractor	28	28	30	28	6.3	6.4	6.6	6.3		
horse	-	-	-	-						
machinery depreciation					6.3	6.8	7.1	7.2		
and repairs					3.1	3.5	3.7	3.7		
contract services					.1	.2	.1	.2		
other fuel					20.9	29.1	15.7	19.4		
Materials - seed					9.1	10.2	10.8	10.9		
fertiliser					4.3	4.3	3.9	2.9		
sundry					3.0	3.0	3.0	3.0		
P.M.B. levy					5.1	5.1	5.5	5.5		
Rent					-	-	-	-		
Market costs										
Total direct costs					93.6	108.9	89.6	93.4		
Share of general farm expenses					22.0	23.4	21.7	21.3		
Adjustment for residual manurial values					-	-	-	-		
Gross cost of production at delivery point					115.6	132.3	111.3	114.7		

TABLE II

Yield, Costs, Returns and Margin per Acre						
Yield per acre	Seed Crops					
	1965			1966		
	9.23 tons			10.54 tons		
	Total	Returns		Total	Returns	
		per ton	per acre		per ton	per acre
	T.	£	£	T.	£	£
Sales - seed	3.92	15.7	61.2	4.97	23.7	117.7
ware	3.13	15.0	47.0	3.35	19.2	64.5
Retd. - seed	1.16	19.0	21.9	1.32	23.0	30.4
ware	.09	17.1	1.6	.11	19.1	2.0
brock	.93	1.9	1.8	.79	2.2	1.8
Total or average	9.23	-	133.5	10.54	-	216.4
Cost			115.6			132.3
Margin			17.9			84.1
Yield per acre	Ware Crops					
	1965			1966		
	8.45 tons			8.9 tons		
	Total	Returns		Total	Returns	
		per ton	per acre		per ton	per acre
	T.	£	£	T.	£	£
Sales - seed (uncert.)	.18	20.9	3.9	.30	22.0	6.7
ware	6.61	16.8	110.9	7.04	21.3	149.7
Retd. - seed	.66	18.6	12.3	.50	21.2	10.6
ware	.23	17.9	4.3	.12	22.0	2.6
brock	.77	2.1	1.6	.94	2.3	2.2
Total or average	8.45	-	133.0	8.90	-	171.8
Cost			111.3			114.7
Margin			21.7			57.1

TABLE III

Summary of Average Quantities per Acre						
<u>Seed Crops</u>						
Materials					Overall Average	
					1965	1966
Seed - home grown bought					cwt	cwt
					21.9	16.6
Manures and fertilisers					5.7	13.0
					Area Dressed Only				178	190
1965		1966				
acres	cwt /acre	acres	cwt /acre	178	190	
600	246	348	264			
F.Y.M.					8.2	8.7
Lime						
Artificials					8.2	8.7
- straights - N P K						
- compounds					795	8.2
795	8.2	566	8.7	8.2	8.7	
<u>Ware Crops</u>						
Materials					Overall Average	
					1965	1966
Seed - home grown bought					cwt	cwt
					13.1	12.8
Manures and fertilisers					6.5	6.3
					Area Dressed Only				206	212
1965		1966				
acres	cwt /acre	acres	cwt /acre	206	212	
384	256	264	280			
F.Y.M.					-	.06
Lime						
Artificials					.04	.06
- straights - N P K						
- compounds					7	2
7	2	19	2	.04	.06	
- compounds					465	9.1
465	9.1	350	8.7	9.1	8.8	

