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Potatoes - Stat as.

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EARLY POTATOES - 1966

by

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THE EDINBURGH SCHOOL OF AGRICULTURE,

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EARLY POTATOES - 1966

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FOREWORD

Early potato growing is only possible in restricted areas in the east of Scotland where soil, topography and climatic conditions are such as to make it possible on husbandry grounds. Lacking the measure of support which is given to main crop potatoes, this crop is one which needs to be given very careful consideration by the farmer before deciding to include it in his cropping programme. On the costs side there are problems of labour supplies, the provision of capital for specialised equipment and the extent to which other crops may compete for available resources at critical periods. The major difficulty is, however, connected with yields, overall market supplies and the effects which these factors have on selling prices and on producers' returns.

In this report the costs and returns for the 1966 crop are discussed and compared with those for 1965. The differences between the two years emphasise the speculative nature of this crop as a contributor to farm profits, particularly concerning returns which tend to fluctuate more widely than do costs.

A considerable part of the report is devoted to assessing certain aspects of costs under differing sets of working conditions and should provide information for the farmer who is in a position to grow the crop. It is useful to know what range of costs is likely to be incurred. The returns have not been capable of analysis to anything like the same degree. The choice of variety is limited, the yield may be influenced by irrigation (if required) but the timing of lifting, and to some extent the yield, is largely determined by weather conditions. Price is a factor which the grower must largely accept from day to day as storage of early ware is not feasible.

For those who are in a position to grow about the same acreage each year as part of a consistent policy, can make reasonably sound arrangements for meeting labour and capital requirements and can establish good market contacts, this crop offers prospects taking one year with another. There is little likelihood of the sporadic grower doing himself or anyone else much good.

J. D. Nutt,
Advisory Economist.

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INTRODUCTION

This report discusses the results of 19 crops of early potatoes grown in the east of Scotland during 1966 and compares these figures with those for 24 crops costed in 1965. In 1965 the sample included 17 crops of Epicure, 3 of Craigs Royal, 2 of Home Guard and 1 each of Arran Pilot and Pentland Envoy. In 1966 Epicure was again the most important variety with 16 crops in the sample and 1 each of Craigs Royal, Home Guard and Pentland Envoy. Additional information was also available in 1966 for 5 crops of Epicure, 3 of Craigs Royal, 2 Home Guard and 1 each of Pentland Beauty and Ulster Chieftain, but for a number of reasons it was not possible to get complete data for these crops.

The average figures given in the report are useful up to a point, but for management purposes a more precise approach is desirable. The data have been analysed to give separate figures for the two methods of lifting the crop, using squads or harvesters, as the labour, tractor and depreciation charges are affected by choice of system. Further information for the preparation of budgets has been included in the management section based on typical figures for costs, operating times etc. derived from the survey.

Background data on price trends, acreages, imports etc. are also included in an attempt to provide a more complete assessment of the early potato enterprise in Scotland.

General Outline

Early potatoes usually followed wheat or barley in the rotation but in 4 cases were taken from the same "early" field - a practice more typical of Ayrshire. Chitted seed was almost invariably used. Considerable wastage of seed occurred during the winter reflecting the widespread outbreaks of blight in the summer of 1965. Following a wet autumn, much of the dung work and ploughing had to be done after Christmas. A slow spring delayed the start of planting until the beginning of March. Most crops were put in during the first three weeks, nearly all by machine.

Chemical weed control was used on 5 farms. Blight warnings were issued in June, but fortunately the disease did not have the serious effects noted in 1965; largely due to a period of fine weather in mid July. Irrigation equipment was used only to a limited extent. Lifting began rather later than in 1965 and proved to be of shorter duration. Most crops were cleared by the second week in August. Half of the crops covered by the survey were lifted by harvester.

Prices were up on the previous year and were well maintained over the lifting period. This was partly due to a slower rate of bulking and to restricted supplies during the final weeks as a result of broken weather from the end of July onwards.

An outline of the cropping on the farms concerned is given in Table I. Three of the 12 farms were situated in the Dundee area and the remainder in East Lothian.

TABLE I

Average Cropping				
Crop	Acreage		Percentage	
Cereals - wheat	68		19	
	114		32	
	7	189	2	53
Potatoes - earlies	25		7	
	36	61	10	17
Roots - sugar beet	14		4	
	8	22	2	6
Grass - 1 to 3 year	45		12	
	3		1	
	13	61	4	17
Vegetables		24		7
Total		357		100

PRODUCTION FACTORS

Seed

Seed costs rose in 1966. This was due in part to higher costs for bought-in seed, but the main cause was the wastage which occurred during the winter. This was widespread, increasing the costs per acre for 17 crops out of the 31 for which data were available. The average wastage was 6.3 cwt which, at £5.6 per acre, represented 20.5% of total seed costs. The diseased tubers were not confined to home-grown material - in fact the most serious losses occurred among bought-in stocks. From this experience it would appear that some allowance should be made in the quantity of seed boxed if the intended acreage is to be planted. Particular care should be taken with seed when blight is known to have been prevalent.

Most crops were grown from chitted seed. Adapted buildings were in general use for this purpose, but a guide to the cost of a new building is given in the appendix (p. xi). In many cases no lights or heaters were used. Several crops were heated only on very cold days so that fuel costs ranged from 2s. per acre to 30s. where heaters and lights were used more extensively. The seed was boxed in the early autumn and was turned at some stage during the winter - usually as a wet weather job.

The costs per acre and the seed rates etc., are summarised in Table II, including data from crops for which full results were not obtained.

TABLE II

Seed Costs and Rates per Acre		
	1965	1966
	£	£
Range in cost per acre	13.0-41.1	13.5-68.6 ¹
Average cost per acre	21.5	27.3 ¹
Average cost per ton	17.2	16.9
Typical cost per acre	19.4	20.8/24.7 ²
Typical cost per ton	18.0	16.0/19.0 ³
	cwt	cwt
Range in seed rate per acre	17.1-45.7	17.0-39.0 ⁴
Average seed rate per acre	25.0	25.5 ⁴
Typical seed rate per acre	21.5	23.0 ⁴
Range of losses in store	n.a. ⁵	nil-30.0
Average loss in store	n.a. ⁵	6.3
	in.	in.
Range in spacing	7-14	7-16
Typical spacing	12-13	13-14

Notes:-

- 1 Includes cost of seed lost in store.
- 2 Home-grown or bought-in seed costs based on the typical seed rate at the typical costs per ton, plus an allowance of 3 cwt to cover losses in store. (Seed was not generally bought-in for the 1965 crop.)
- 3 Home-grown or bought-in costs per ton.
- 4 Seed rates planted. (Losses in store excluded.)
- 5 Not available, but of much less significance.

Fertilisers

Fertiliser use is summarised in Table III. The figures again include data from a number of crops for which complete costs were not obtained.

The results show that no credit was given for any nutrients contributed by the F.Y.M., there being little difference in the levels of plant food applied as artificial manures between those crops which were dunged and those which were not. The table shows a wide range in dressings applied but these figures correspond only approximately to the nutrient level as the concentration of the fertiliser varies with the compound used. The range in costs is therefore a better guide to nutrient level in some respects. The higher costs correspond to higher levels of nutrients, particularly of nitrogen. Seven crops received over 200 units of nitrogen per acre in 1966, with similar levels being given in a number of cases in the previous year. There seems little doubt that too much nitrogen was applied to these crops.

TABLE III

Fertiliser - Composition, Rates and Costs per Acre								
1965				1966				
No. of cases	Units of				Units of			No. of cases
	N	P	K		N	P	K	
24	168	103	122	Average ¹	167	103	118	31
15	179	101	109	F.Y.M. ¹	166	108	127	19 ²
9	163	104	129	No F.Y.M. ¹	169	99	108	9
				<u>Dressings</u>				
				<u>Artificials</u>				
24	6.9-12.0 cwt			Range	6.0-10.4 cwt			31
24	8.5 cwt			Average	8.6 cwt			31
				<u>F.Y.M.</u>				
15	9.0-22.0 tons			Range	10.0-20.0 tons			19 ²
15	15.0 tons			Average	17.4 tons			19 ²
				<u>Costs</u> ³				
£8.0-£13.9				Range	£6.7-£14.2			
£10.4				Average	£11.0			
£10.0				Typical	£10.0-£11.0			

Notes:-

- 1 Nutrients derived from the artificials only.
- 2 Excludes 3 crops which received an average dressing of 4 tons per acre of poultry manure.
- 3 Excluding the value of any dung applied.

Planting

Planting was mechanised on all but 2 farms. The majority of crops were planted with a 3-row semi-automatic implement which required a minimum team of 4 people for its operation. An additional worker was sometimes included in the team to assist with seed on the planter. Various other machines were used but in each case information was restricted to 3 or 4 crops in either year so that the times given in Table IV should be treated with some reservation apart from those for the 3-row semi-automatic unit which are more definite. There was considerable variation in times so the figures are offered as a guide only.

Seed was often loaded by the regular staff the previous evening or first thing in the morning before the casual workers arrived. Carting and general assistance tended to take longer with hand planting as more down-the-drill work was required.

TABLE IV

Planting - Summary of Costs and Rates of Work per Acre				
<u>Summary of costs</u>	2 row semi-auto.	3 row semi-auto.	3 row auto.	Squad
	£	£	£	£
Purchase price	160	200	310	-
Annual charge ¹	39	48	75	-
Cost per acre at break-even acreage	2.5	2.8	3.5	-
Casual labour cost ²	1.4	1.1	.4	3.4
Transport	-	-	-	.5
Total cost ³	3.9	3.9	3.9	3.9
Break-even acreage ⁴	15.6 ac.	17.1 ac.	21.4 ac.	-
<u>Summary of typical hrs</u>	Typical Hours per Acre			
<u>Planting</u>				
regular labour	3.5	1.8	1.9	3.4
casual labour	7.0	5.4	1.9	15.0
total labour	10.5	7.2	3.8	18.4
tractor	3.5	1.8	1.9	-
<u>Carting</u>				
regular labour	2.0	2.0	2.0	3.0
tractor ⁵	1.0	1.0	1.0	3.0
Covering - regular labour and tractor	included with planter			1.2
Range in "team" hours per acre	2.2-5.3	1.3-3.0	1.5-2.1	1.4-2.0
Approximate acreage planted in 8 hours	2.3	4.4	4.2	4.7

Notes:-

- 1 Includes interest at 8% on half the purchase price, based on a life of 5 years.
- 2 4s. per hour for casual workers on the planters, 4s.6d. per hour for the squad, based on the typical hours worked.
- 3 Regular labour and tractor costs have been ignored as they would be largely incurred regardless of the system chosen.
- 4 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 One or 2 tractors, depending on the length of the field and the rate of work.

Weed Control

Traditional means of control continue to be widely practised with only 5 farms employing chemicals to control weed growth. This can be explained in part where drills are kept shallow until the foliage appears; inter-row cultivations are then carried out and the ridges built up with the growing plants. This can be done where labour is available, controlling weed growth at the same time, but can also lead to packing of the ground or to moisture loss in dry years. The normal run of field work required 1.5 to 3 hours per acre during the months of April and May which compared unfavourably with the 0.5 hours necessary for spraying. The cost of chemicals has fallen somewhat compared with 1965 and typical costs of £2-£3.5 per acre were recorded. Paraquat was the most popular herbicide, but mixtures with linuron or of mon-linuron and dinoseb were also noted. Results were satisfactory in most cases with the exception of 1 field where a paraquat mixture was applied too early and had to be repeated. Chemical control offers a practical alternative, particularly when labour is restricted and for dryer fields where moisture loss could be critical.

Irrigation

For the second year in succession, irrigation equipment was little used. The level of investment remained around the £2000 mark per farm, representing a large sum of money to have lying idle. The high costs were mainly associated with bore-holes and distribution lines necessitated by the lack of surface water in East Lothian. A guide to capital costs is given in the appendix (p. xi) but anyone requiring a more detailed assessment of this subject under Scottish conditions is referred to a report put out by the Economics Department of the North of Scotland College of Agriculture*.

Three farms used their equipment with widely differing labour requirements per acre inch. These results are given in outline below but must be treated with considerable caution.

About 2 days were required with a team of 2-3 men in setting up and dismantling the equipment. In 1 case 3 inches were applied, the remaining cases receiving only 1 inch per acre. Labour, including carting out etc., ranged from 1.6 hours per acre up to 4.2 hours with estimated costs of 14s.-35s. for fuel and labour per acre inch. Repair costs did not arise but might have been 10s.-£1 per acre had the equipment been more extensively used. Up to 4 shifts a day were made and the equipment was left unattended for part of the time.

Blight

Warnings were issued in mid-June but fortunately the disease failed to develop with the result that losses were insignificant compared with 1965. This was partly due to the fine weather experienced during the first 3 weeks of July. A number of crops were sprayed, in several cases more than once. The operation was generally carried out by a contractor at a typical cost per application of about 30s. per acre.

Blight may not be a serious threat to the earlier crops but it is obvious from the results experienced in 1965 and the seed losses among tubers retained over the winter, that great care must be taken with later crops, especially if intended to provide the seed for the following year. If there is any risk of infection it would seem to be a worth-while insurance to spray against blight before it appears and to spray down with acid if the disease becomes established, particularly where a seed crop is concerned.

* Economic Report No. 117 "Farm Crop Irrigation in the North of Scotland - 1964 and 1965" by J. S. Bone, M.Sc.

Lifting

The 1966 harvest period was an easier one than the previous season except during the final weeks when the weather broke. However conditions were good during much of July, with the result that work went ahead well. Most crops were off the land by the second week in August. Squads and harvesters were used in equal proportions to lift the crop. Lifting earlies is a slower operation than for maincrop potatoes and the labour requirements are complicated by the need to dress the crop at the same time. On 1 or 2 farms the harvester was used to lift about an acre during the early part of the day and then everybody transferred to the riddle and dressed the crop. This worked well, allowing 6-8 tons to be cleared each day with the same team of 4-5 casual workers. Some overtime was usually required on the dresser in order to clear the day's lifting.

The figures given in Table V show the range in costs of casual labour and give an indication of the general level of expenditure incurred during 1966. A typical cost for dressing has not been shown as the team may include regular workers and the time taken will depend on the yield per acre. Total labour and tractor hours are also summarised in the table, the figures for the digger or harvester and for carting corresponding to regular labour and tractor work. Regular labour was also used to some extent for picking and more particularly for dressing. The figure of 3.2 hours per ton shown as being typical for dressing potatoes represents the total labour input, equivalent to a team requirement of 0.53 hours per ton with 6 workers.

In view of the labour problem and the greater flexibility of working which a harvester permits, the ownership of a harvester is becoming a more attractive proposition. The partial budgets included in Table V indicate that for a harvester costing £950, the break-even acreage is likely to be around 27 acres, although a cheaper machine and/or fewer pickers would obviously become competitive at a lower acreage*. Regular labour costs and tractor expenses would be largely incurred regardless of system and have therefore been ignored. Any superseded digger is likely to be retained for use in event of break-down or bad weather and it is unlikely that any saving will be made in transport costs as 8-9 casual workers will still be required. This leaves the difference between casual labour plus repair costs as the basis of the calculation.

The main points to remember when considering a harvester are firstly, that the rate of work will almost certainly be slower than a squad while still requiring a similar team of regular workers. Secondly, use of the implement may be seriously curtailed by wet weather and finally, it is important to remember that steady progress is being made with harvesters from the technical view point so that an implement may have a very low trade-in value after only 3-4 years.

Labour Requirements

The more important operations of planting and lifting have been discussed in the appropriate sections. Graphs I and II have been drawn to show the typical hours and team requirements for two different systems of production, A and B as outlined in the budget examples given in the management appendix (p. xv). The hours and team requirements are not necessarily the optimum ones for a given situation but they are based on the typical figures derived from the results of the survey during 1965 and 1966.

The labour requirements are shown as columns on the graphs. The width of the columns is proportional to the team hours required for a given operation and the height of the columns corresponds to the team number. It can be assumed that the lower portions of each column

* At the break-even point, lifting costs per acre are the same for both methods.

TABLE V

Harvest Work			
Summary of casual labour costs per acre			
	Range	Typical	
	£	£	
<u>Lifting</u>			
squad	12.1-23.2 ¹	18-19	
harvester	2.3- 9.5	7.0	
<u>Dressing</u>	nil-12.9	- 2	
Summary of labour and tractor hours per acre			
	Range	Typical hours	Typical team
<u>Hand Lift</u>			
digger ³	3.6- 8.0	4.2	1
pickers ³	64.0-86.0	80.0	18-20
carting ³	3.6-12.2	8.4	2
<u>Harvester</u>			
harvester ³	4.0- 8.2	6.3	1
pickers ³	10.0-44.8	25.2-31.5	4-5
carting ³	8.0-16.5	12.6	2
<u>Dressing</u>			
total labour	2.3- 5.5 hrs per ton	3.2 hrs per ton	6
Comparison between a harvester and hand lifting - partial budgets per acre			
			£
Purchase price of harvester			950
Annual allowance over a life of 4 years ⁴			<u>276</u>
Casual labour cost for a squad - 80 hrs @ 4s.6d.		£18	
Repair allowance for digger		<u>0.7</u>	18.7
Casual labour cost for pickers on a harvester - 31.5 hrs @ 4s.6d.		£ 7.1	
Repair allowance for harvester		<u>1.5</u>	<u>8.6</u>
Difference in casual labour + repair costs			£10.1
The annual allowance for the harvester falls to £10.1 per acre at 27.3 acres, representing the break-even acreage.			

Notes:-

- 1 The lowest costs per acre were recorded in the Dundee area and the highest figures in the Lothians.
- 2 This will depend on the number of regular workers in the team and the tonnage being handled.
- 3 Corresponds to regular labour and tractor work. Regular labour was also used to some extent for picking and for dressing.
- 4 Includes interest at 8% on half the purchase price.

represent regular labour, although the actual number of workers will vary from farm to farm. If a farm has a staff of 4 regular workers they should be able to handle all the work outwith the peak periods and will be able to do all the tractor work at planting and lifting.

Planting and lifting teams may be regarded as composite units comprising several self-contained teams. Cultivations, drilling etc., can be done by two men while a further two men cart out seed and fertiliser, both teams being independent of the actual planting team. A few acres can be planted with a smaller team than the 15 or 8 workers indicated on the graphs, if the operations are tackled individually over a period of days. On the larger holdings however, the general practice was to do all the work more or less at once - hence the larger team numbers. Harvesting earlies cannot be satisfactorily staggered over a number of days as can the planting sequence of operations, so there is little alternative to the full numbers, particularly when lifting by hand. Where harvesters are being used it is possible to cut the required team by lifting during the early part of the day and then dressing the crops in the afternoon and evening. However this was not widely practised, so that the full team of 28 or 14 workers would normally be required. (The dressing times have been shown alongside the lifting teams for convenience in preparing the graphs and the team numbers should be added together to give the totals mentioned.)

The graphs emphasise the need to plan field work on the basis of "team" hours rather than total hours per acre. It must be appreciated that many operations cannot be carried out efficiently with less than a certain number of workers.

Comparison between the two graphs shows the reduction in team number which can be made by mechanising the operations at the periods of peak labour demand. They also indicate the slower rate of working which can normally be expected if a harvester is used to lift the crop. The slower rate of working by a harvester might suggest that a smaller dressing team could be employed and still keep pace with the lifting. This would certainly be the case if both harvester and dressing team worked for the same length of time. On the other hand, the dressing team of 6 workers could equally well be kept fully occupied for an 8 hour day if the harvester was worked on overtime in the evenings, as was the case on a number of farms.

When related to other enterprises, early potatoes fit in well from the point of view of labour requirements. The graphs indicate that the main peak is likely to occur in July, which is too late to interfere with sugar beet and too early to clash with the grain harvest. Second-cut silage may be a problem on some farms. Planting will not clash seriously with barley as the delay caused by planting 20-30 acres of early potatoes is not likely to be critical for the success of the barley enterprise.

In conclusion it should perhaps be stressed that the above comments can only apply to a farm which is suitable for early production. On a late farm the lifting would be delayed into August and would compete with the grain harvest, with possible repercussions on the work schedule for the rest of the season. Larger farms may be able to lift potatoes at the same time as combining grain, but this will depend on the individual situation.

Partial Capital Profile

Graphs III and IV refer to the budget examples given in the management appendix (p. xvi). The purpose is to show how the variable costs accumulate month by month over the production period. Seed prices will tend to vary most from year to year but the pattern will remain broadly the same.

The capital required for growing early potatoes includes the variable costs of the enterprise and also a proportion of the fixed costs incurred in running the farm. Regular labour could be allocated to the potato crop but the use of regular labour is flexible on most farms and can be redeployed without necessarily affecting the general level of expenditure on wages. Depreciation charges on specialised equipment could also be allocated but would vary according to the acreage grown. Once the equipment has been purchased, depreciation charges become part of the general burden which has to be met irrespective of changes in the size of the potato enterprise and there is little to be gained by trying to allocate the costs. The other items of general expenditure necessarily incurred in the running of the business are not usually significantly altered by changes in farm policy. For these reasons the capital profiles shown in the graphs only include the variable costs specific to the early potato enterprise, which will vary in direct proportion to the acreage planted and which will show a common pattern for most farms.

Referring to the graphs, the initial outlay on seed occurs in September and is followed soon after by fertiliser, which is usually bought early to take advantage of delivery rebates. A small charge for sundry items is increased by heating and lighting costs in late winter, sprays, etc. during the early summer and a greater outlay at harvest. Some casual labour costs are incurred at planting and there is a heavier requirement at lifting time. Rather less 'variable' capital is required for system B - largely the result of a reduced casual labour bill associated with mechanised planting and lifting.

Early potatoes fit into the farm system well from the financial point of view, always assuming that the farm is suitable for early production and that returns are likely to be satisfactory. The enterprise provides a source of income at a time when little else is coming in. There may be some return from fat lambs for example, but it is too early for any contribution from the cereal enterprises. By providing income at this time, the early potatoes may ease the need to sell grain off the combine in order to raise cash. The flow of short term capital into the enterprise is considerable during the final weeks but this is soon recovered, comparing favourably with maincrop potatoes where a period of months may pass before sales begin and the investment realised.

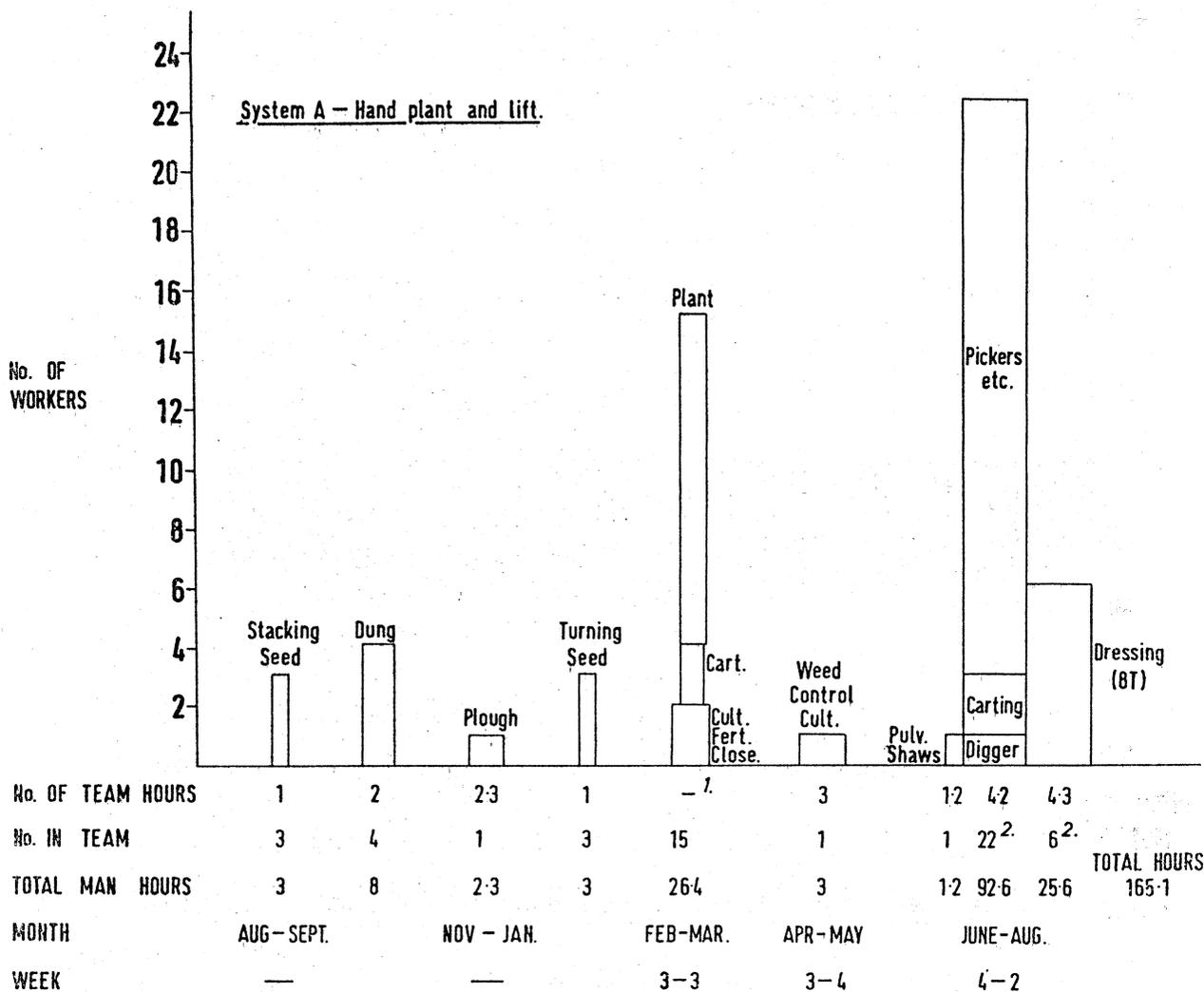
Graphs I and II

Notes:-

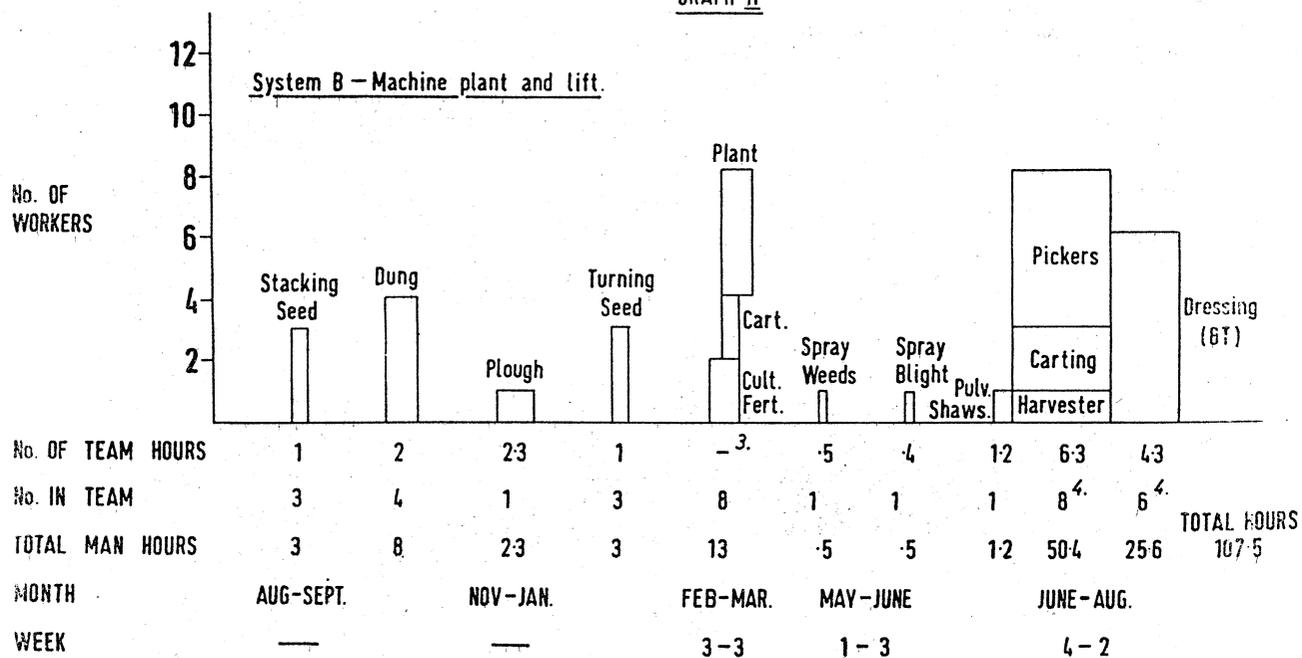
- 1 Team hours - planting, 1.7 hrs; carting, 1.5 hrs; cultivations, etc., 1.9 hrs.
- 2 Combined team number for lifting and dressing - 28 workers.
- 3 Team hours - planting, 1.8 hrs; carting, 1.0 hrs; cultivations, etc., 1.9 hrs.
- 4 Combined team number for lifting and dressing - 14 workers.

GRAPH I

LABOUR REQUIREMENTS PER ACRE



GRAPH II



Price Trends

The second year of the survey proved to be much better than 1965 from the financial viewpoint, in fact the best since 1962. Prices per ton were well up on the previous 3 years and remained at higher levels throughout the season as shown in Graph V.

The prices received for early potatoes depend on a number of factors such as acreage, yield per acre, weather conditions during the lifting period, imports to some extent and the phase-out of main crop supplies from the previous year. Potatoes used for human consumption during the months from May to August for the last 5 years are given in Table 1 in Appendix B; Table 2 shows the acreage grown by variety in Scotland and in Great Britain. The average yields per acre are also shown for the years 1962 to 1965. The yields for 1966 are not available but may be slightly down in Scotland compared with 1965, judging from the results of the crops covered by the survey. Table 3 shows the acreages of early varieties grown for seed in Scotland.

The total acreage of early and second early potatoes has declined from a peak of 148,100 acres in 1964 to 112,700 acres in 1966. The Scottish figures show a decline from 31,800 acres grown in 1963 to 17,500 acres in 1966, the peak being reached a year earlier than for the national acreage. Second early varieties form a relatively small proportion of the acreage and have not fluctuated as much. The decline among the first early varieties has been mainly at the expense of Arran Pilot, particularly in England and Wales. In Scotland the first early acreage has fallen by nearly 50% but a study of the acreages grown for seed suggests that the fall has been less dramatic among ware crops. Epicure is the most important variety grown for ware in Scotland. Plantings of Epicure have fallen by 4200 acres since 1963 but approximately 1000 acres of this can be attributed to seed crops. During the same period the acreage of Arran Pilot grown in Scotland has fallen by nearly 5000 acres, most of which would have found its way south as seed. Craigs Royal provides the bulk of the second early potatoes. Its acreage has remained relatively stable during the last three years.

Imports have often been blamed for the fall in prices to producers. The figures given in Table 1 in Appendix B show the consumption of potatoes during the summer months. Unfortunately, figures are not available to show the actual production of early potatoes from British farms and it is possible that in years of surplus, a greater quantity was produced than could be absorbed despite the low prices being paid. However the figures do give an indication as to supplies during the previous 5 years. The level of total through-put in 1962 was the lowest during the last five years corresponding with the highest prices, suggesting that total supplies from all sources were barely adequate. The poor returns in 1965 coincided with the lowest level of imports during the five-year period for the month of June and was followed by the highest production from home-grown crops in July. From these figures, imports had little effect on prices during 1965. The only year when imports probably did tip the balance against the producer in this country was during 1964, when relatively high imports in June coincided with heavy liftings from British farms. As 1964 was also the year when the greatest acreage was grown, there is much less risk of a similar situation arising again with the current level of plantings.

The phasing of supplies so as to provide the required level of around 350,000 tons per month is difficult to achieve as the various factors are largely unknown at the time or are beyond the control of the authorities or the individual farmer to correct quickly. Fixing the acreage could still result in a tremendous range in supplies from year to year. The phasing out of the previous year's maincrop supplies depend on how well

the crop has kept, reflecting lifting and storage conditions during the previous autumn and the warmth or otherwise of the subsequent spring. Imports vary according to the circumstances affecting the potato crop in the exporting countries and home supplies, even with regulated acreages, would depend on the weather as to when and in what quantities potatoes become available. One cannot do without imports as supplies of sufficient quality are inadequate from home sources. An accurate phasing of supplies is difficult to realise however desirable it may be.

The previous paragraph has outlined the difficulties and uncertainties which confront early producers from year to year and also makes it almost impossible to indicate what may be expected from the enterprise in the future. The broad pattern of high prices at the start, falling fairly rapidly thereafter as yields increase, will remain, but to what level prices will have fallen by a given week can only be guess work. If acreages, yields and imports were to remain close to the 1966 pattern, the trend in prices over the lifting period might at least be expected to follow the movement of the five year average. If this level of prices is taken as the guide line, it is possible to calculate what tonnage would be required to provide a gross margin of £80 per acre during any particular week of the lifting season. This has been done in Graph VI, but can only be a very rough guide and it should be appreciated that it would have proved optimistic in 3 out of the last 5 years.

Acreages have fallen since 1964 which has tended to reduce the level of production but prices could still be thrown out of step by abnormally high yields or exceptional lifting conditions. Labour problems on many farms have tended to reduce the number of marginal producers who may be tempted by high prices to come back into early potatoes so that this danger may not be as important a factor as previously. The last few years have seen the early acreage shrink to the level corresponding to those farms better suited to early production. This is probably a good thing as these farms are much more likely to be able to produce a certain quantity by a known date and therefore make it possible to phase supplies a little more accurately and could result in a more stable price structure from year to year.

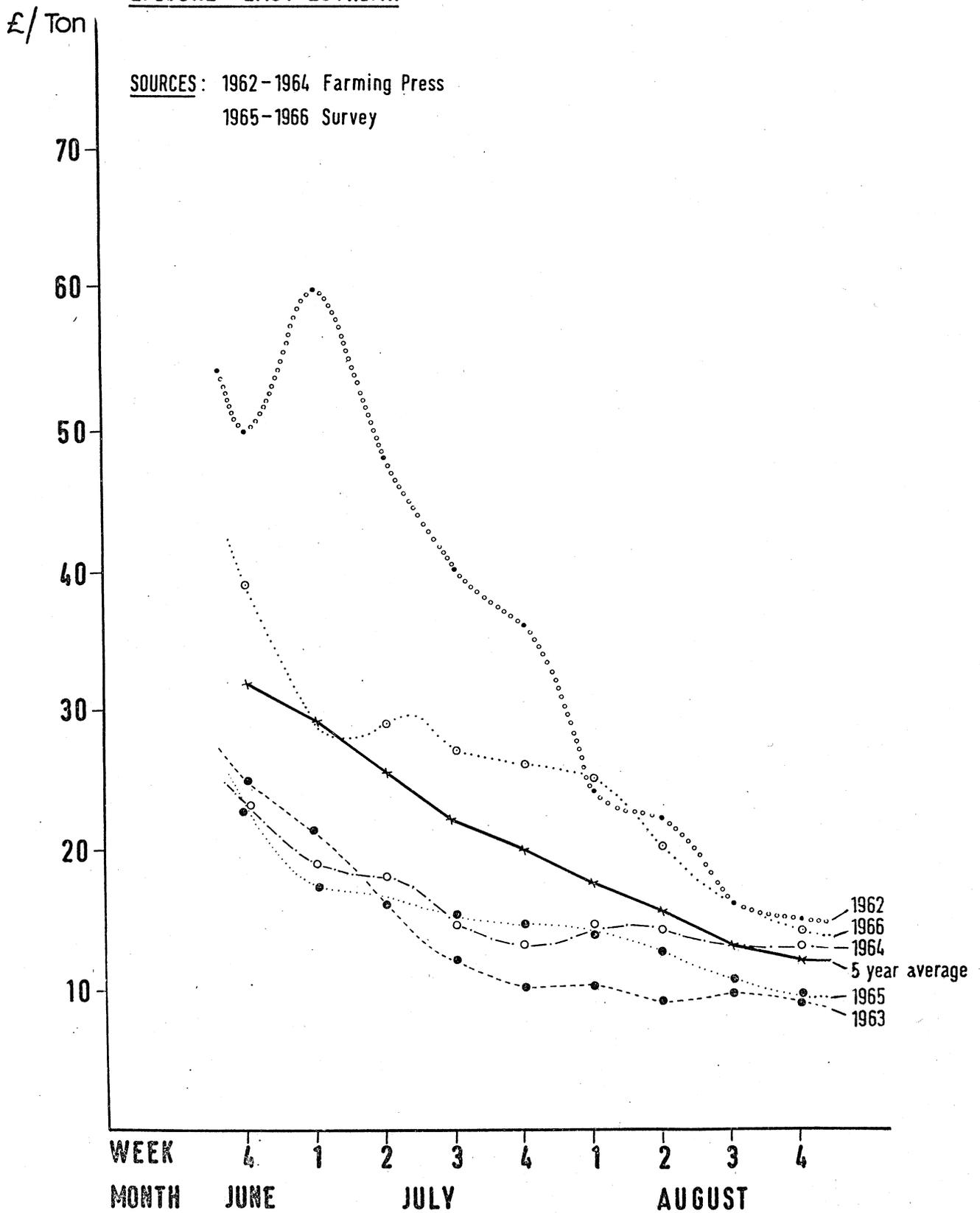
AVERAGE RESULTS

The average results for the two years are given in Tables VI and VII. Further information is given in Appendix C where the more important costs are shown for crops lifted by hand and by harvester, as the different levels of outlay on casual labour effect the variable costs and therefore the gross margins. Distribution tables for the main items of expenditure, labour and tractor hours are also given. Three crops have been excluded from these tables for both years as they were partly lifted by both squads and harvesters.

The 1966 season proved to be very satisfactory for most producers, only one crop being grown at a loss on a full accounting basis compared with 8 crops in 1965. This was due almost entirely to the improved level of prices received throughout the lifting period. Costs remained very similar to the 1965 total although there were some differences, particularly among the variable costs. Seed costs rose largely because of the wastage which occurred in store over winter. Seed rates and costs were higher for the least profitable groups in both years. This was due in part to the inclusion of crops of Red Craigs Royal which involved higher seed rates at higher costs per ton. Casual labour costs were generally less as a result of the better lifting conditions which prevailed during most of July. Contract charges were high for the worst group in 1966 due to the inclusion of a number of crops which were part-lifted by harvester on contract.

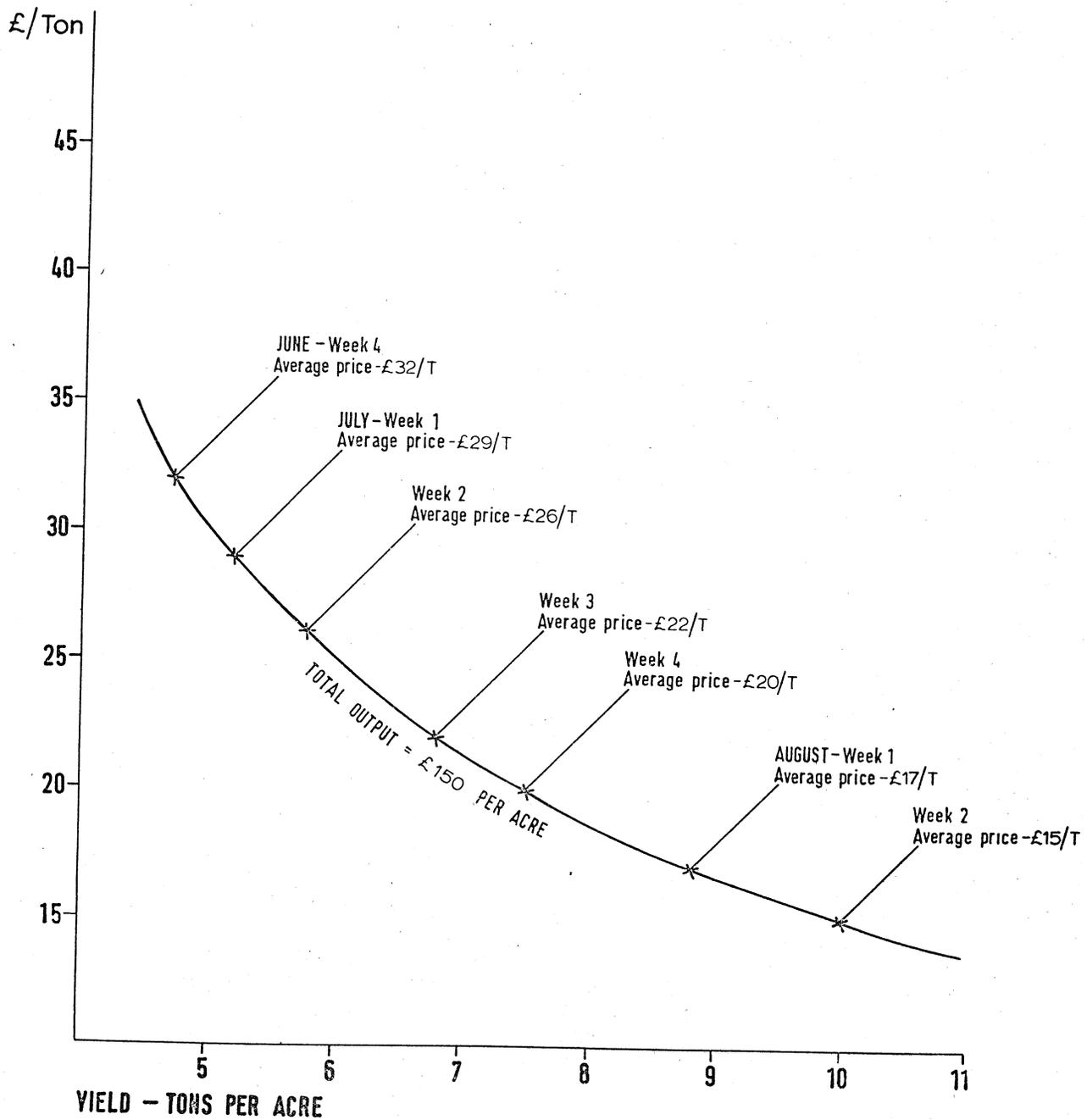
GRAPH V

APPROXIMATE TREND OF PRICES PER TON 1962-1966
EPICURE - EAST LoTHIAN



GRAPH VI

YIELD PER ACRE REQUIRED TO PRODUCE A GROSS MARGIN OF £80 PER ACRE
[VARIABLE COSTS £70] BASED ON THE AVERAGE PRICES IN SCOTLAND FOR
THE FIVE YEARS 1962-1966.



The average figures for all crops show little difference in sundry expenditure but when reanalysed according to lifting technique, the outlay was considerably more for crops lifted by harvester. This was due to most farmers providing their own bags when lifting by harvester. Merchants often provided the squads when crops were hand lifted and they usually provided their own paper bags as well. Farms with harvesters were less dependant on particular merchants for their casual labour requirements and often sold their potatoes to several different merchants, providing their own bags for at least part of their sales.

Regular labour costs varied depending on the casual labour expenditure, being high for crops lifted by harvester. Differences in depreciation charges depended on the choice of machinery and the presence or absence of irrigation equipment.

As the results show, the crops which did less well in either year did so mainly because of differences in returns rather than costs. The reasons for greater profitability can be traced to price movements and to yields per acre. The more profitable crops in 1965 were lifted early and generally sold by the second week in July. In 1966, crops lifted during mid July tended to do better than the earliest crops, benefiting directly from the higher yields obtained, associated with the relatively stable prices received over the period. The two years could hardly have been more different, emphasising the difficulties of trying to plan ahead.

TABLE VI

Average Results per Acre - 1965						
	Best 5		Average		Worst 5	
	£	£	£	£	£	£
<u>Output</u>						
seed		14.6		14.2		11.8
ware		168.1		129.9		84.5
brock		.4		.6		.3
Total output		183.1		144.7		96.6
<u>Variable costs</u>						
seed		22.6		21.5		25.0
fertiliser		9.8		10.4		11.4
casual labour incl. transport		20.7		28.4		43.6
contract		2.3		1.6		3.3
fuel (excl. tractor)		.5		.6		.1
sundry						
P.M.B. levy	2.0		2.5		3.0	
boxes	1.8		1.6		1.3	
sprays	1.7		1.3		.2	
bags	3.7		2.8		2.5	
other	.3	9.5	.2	8.4	-	7.0
Total variable costs		65.4		70.9		90.4
Gross margin		117.7		73.8		6.2
<u>Fixed costs</u>						
regular labour		15.0		14.8		9.2
tractor deprec. and fuel		6.7		6.8		5.2
deprec. of specialised equipment		10.8		9.6		7.7
rent		6.1		5.9		5.6
overheads		21.3		23.7		23.9
Total fixed costs		59.9		60.8		51.6
Total costs		125.3		131.7		142.0
Estimated profit		57.8		13.0		-45.5
<u>Average yields - tons</u>						
seed	1.00		.90		.85	
ware	8.65		9.00		8.60	
brock	.20	9.85	.30	10.20	.15	9.60
Average ware price per ton		£19.4		£14.4		£ 9.8
Average seed price per ton		£14.6		£15.7		£13.9
Average seed rate, cwt		25.2		25.0		30.0
Average seed cost per ton		£18.0		£17.2		£16.7
Average fertiliser rate, cwt		7.8		8.5		9.7
units of N	169		168		207	
P	95		103		103	
K	102		122		127	
<u>Average hours</u>						
casual labour	83.5		105.3		146.5	
regular labour	46.9	130.4	47.9	153.2	29.1	175.6
tractor		31.1		30.5		23.1
No. of crops		5		24		5
Total acreage		56		431		111
Average acreage		11.2		18		22

TABLE VII

Average Results per Acre - 1966						
	Best 5		Average		Worst 5	
	£	£	£	£	£	£
<u>Output</u>						
seed		13.4		10.5		1.4
ware		224.9		183.3		155.7
brock		.2		.3		-
Total output		238.5		194.1		157.1
<u>Variable costs</u>						
seed		20.9		24.5		29.0
fertiliser		9.5		10.0		9.9
casual labour incl. transport		21.7		19.6		17.0
contract		1.4		4.8		12.0
fuel (excl. tractor)		.8		.6		.2
sundry						
P.M.B. levy	1.9		2.1		2.4	
boxes	2.2		2.5		2.8	
sprays	.5		.7		.3	
bags	3.2		2.6		3.2	
other	1.5	9.3	.2	8.1	-	8.7
Total variable costs		63.6		67.6		76.8
Gross margin		174.9		126.5		80.3
<u>Fixed costs</u>						
regular labour		18.4		16.3		16.3
tractor deprec. and fuel		8.2		7.1		5.1
deprec. of specialised equipment		8.0		10.1		12.7
rent		5.5		5.4		5.4
overheads		25.2		22.5		19.4
Total fixed costs		65.3		61.4		58.9
Total costs		128.9		129.0		135.7
Estimated profit		109.6		65.1		21.4
<u>Average yields - tons</u>						
seed		.68		.51		.10
ware		8.68		7.41		6.99
brock		.10	9.46	.14	8.06	-
Average ware price per ton		£25.9		£24.5		£22.3
Average seed price per ton		£19.9		£20.6		£14.0
Average seed rate, cwt*		22.6		24.3		29.8
Average seed cost per ton		£16.1		£16.7		£18.1
Average fertiliser rate, cwt		8.1		8.3		7.6
units of N		160		153		159
P		95		98		94
K		103		114		94
<u>Average hours</u>						
casual labour	87.6		77.4		63.0	
regular labour	<u>55.3</u>	142.9	<u>49.1</u>	126.5	<u>44.6</u>	107.6
tractor		36.5		30.9		22.8
No. of crops		5		19		5
Total acreage		53.5		249.5		73.5
Average acreage		10.7		13.1		14.7

* excludes losses in store.

CONCLUSION

It is desirable that the gross margin should not be less than £70 to £80 per acre. In 1965 nine crops were below this level, while only two crops were less satisfactory in 1966. Due to the differing levels of casual labour input associated with lifting by hand or by harvester, the total variable costs can show a considerable range. This affects the gross margin and suggests that the aim should be around £70 minimum where crops are lifted by hand and that £80 per acre would be preferable for crops which are lifted by harvester, as they require a higher level of "fixed" costs, in particular depreciation charges on specialised equipment.

Early potatoes can still be profitable below these levels provided the gross margin remains better than for other enterprises and the fixed costs are not seriously affected by introducing or continuing to grow the crop. The uncertainty of returns from early potatoes must inevitably affect the choice and the enterprise must be very carefully considered before proceeding, if the gross margin is likely to be much below the target figures indicated.

The high gross margins which were realised in 1966 must be set against the much less attractive results achieved in the previous 3 years. There is no guarantee that returns will be similar in another year and in fact the odds are against this. At the same time it is important that those farmers who are able to grow early potatoes should be able to do so with a greater degree of confidence as to the outcome. The acreage has fallen in recent years which has undoubtedly helped to raise prices by reducing the quantity of potatoes coming forward, but the results of 1966 should not be taken as a signal for the marginal producers to go back into early potatoes on a large scale. There is very little scope for increased acreage as the market is finely balanced at best and a rise in supplies from any quarter can have effects on prices out of all proportion to the additional quantity involved.

It is perhaps worthwhile to stress that gross margins represent only part of the story. They provide an indication of the general efficiency of the enterprise in terms of output and of the variable inputs such as seed, fertiliser and casual labour, but have little bearing on the other costs incurred in running the farm business. They form a very useful starting point in business analysis as they can be fairly easily worked out and can be readily compared with results from other farms. Having once decided that potatoes would appear to be a feasible proposition from the gross margin calculations and from the husbandry points of view, it is essential that the effects of introducing early potatoes on the rest of the farm business should be assessed. Regular labour is one problem and investment in equipment is another which will merit attention. In connection with the latter, alternative uses of capital will have to be considered as once invested in machinery, very little can be recovered. This is particularly true with regard to harvesters used on smaller acreages as technical developments in this field are such that machines can become obsolete well before the end of their working lives.

SUMMARY

1. The results shown in this report are based on 19 crops covering 249 acres on 12 farms grown in the east of Scotland during 1966. Comparison is made with results from 24 crops covering 431 acres on 14 farms in 1965. Epicure was the most popular variety grown.

2. Most crops followed a cereal, were dunged and were grown from chitted seed. Mechanical planters were in general use and half the crops were lifted by harvester in 1966.
3. Prices were much higher in 1966 compared with the previous year, giving the best returns since 1962.
4. Average costs were slightly down during 1966, despite higher seed costs resulting from losses in store over winter. Casual labour costs were less due to more efficient working associated with better weather during most of the lifting period. Total costs averaged £129 per acre compared with £132 in 1965. Of these totals, variable costs amounted to £68 and £71 per acre respectively; fixed costs were steady at £61 per acre for both years.
5. Output was well up in 1966 with an average return of £194 per acre compared with £145 in 1965. Average yields were 8.06 tons per acre and 10.2 tons respectively. In 1965 the best crops were generally sold by the first fortnight in July while the best returns in 1966 tended to arise among crops sold rather later on in the month. This was due to higher yields in association with a relatively stable level of prices over the period. In both years the least profitable crops suffered from lower levels of output, rather than substantially higher levels of expenditure.
6. Gross margins showed a similar trend rising from an average of £74 per acre in 1965 to £126.5 in 1966.
7. The good results experienced in 1966 have to be compared with the indifferent results for the 3 previous years and must not be regarded as a signal for marginal producers to go back into early potatoes on a large scale.

ACKNOWLEDGMENTS

Grateful acknowledgments are due to the farmers for their help and co-operation in providing the data on which this report is based, to the Potato Marketing Board and the Department of Agriculture for Scotland for statistics relating to the crop and to my colleagues for help and advice in the preparation of this report.

APPENDIX A

Costing Method

The costs have been divided 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. If a value were to be placed on the dung, this would appear as a variable cost and would therefore reduce the gross margin.

Casual Labour and Contract Work

Charged at the rates paid.

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 a sum of 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. No attempt has been made to allocate tractor fuel; the charge included fuel, depreciation and repairs.

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 or 'earlies' acreage where appropriate.

Rent

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

Overheads

Overheads have been charged at the following rates:-

Per acre	14s.3d.
Per £ labour	7s.0d.
Per tractor hour	6s.3d.

APPENDIX B

Table 1

Potatoes used for human consumption during the summer months in Great Britain					
	Thousand Tons				
	1962	1963	1964	1965	1966
<u>May</u>					
Maincrop - H.G.	125	252	228	262	272
Imp.	38	34	-	-	-
N.Ir.	5	12	13	...	4
Earlies - H.G.	-	...	1	2	1
Imp.	114	82	108	104	79
Total - May	282	380	350	368	356
<u>June</u>					
Maincrop - H.G.	8	104	98	86	123
Imp.	21	36	-	-	-
N.Ir.	1	7	2	-	2
Earlies - H.G.	88	80	162	158	127
Imp.	154	114	118	93	108
Total - June	272	341	380	337	360
<u>July</u>					
Maincrop - H.G.	-	18	18	9	n.a.
Imp.	-	-	-	-	"
N.Ir.	-	-	-	-	"
Earlies - H.G.	230	259	323	333	"
Imp.	42	36	7	9	"*
N.Ir.	1	...	...	-	"
Total - July	273	313	348	351	n.a.
<u>August</u>					
Earlies - H.G.	325	359	358	372	n.a.
Imp.	14	1	...	...	"*
N.Ir.	...	...	...	-	"
Total - August	339	360	358	372	n.a.

* July-August total was 19,000 tons

Abbreviations:- H.G. Home-grown
 Imp. Imports
 N.Ir. Shipments from Northern
 Ireland
 ... Less than 500 tons

Source:- Potato Marketing Board

Table 2

Acreages by variety planted by registered producers										
	Thousand Acres									
	Scotland					Great Britain				
	1962	1963	1964	1965	1966	1962	1963	1964	1965	1966
<u>First Earlies</u>										
A.P.	7.4	8.1	7.8	5.6	2.7	49.3	53.5	50.1	37.2	26.1
H.G.	2.8	3.1	3.6	3.0	2.3	15.1	16.5	19.2	19.5	17.7
Ep.	8.9	10.2	9.2	8.2	6.0	9.2	10.6	9.5	8.3	6.1
U.Ch.	.5	.4	.4	.3	.3	6.1	6.0	6.2	6.0	4.9
U.P.	.4	.5	.3	.2	-	5.8	6.1	6.6	5.5	3.5
U.Pr.	.3	.3	.1	.1	-	9.2	9.8	10.7	10.9	11.0
D. of Y.	.9	1.0	.8	.7	.8	2.9	2.8	2.4	2.0	1.8
Others	1.0	1.1	1.2	1.0	.9	4.8	4.7	5.7	5.5	6.0
Total first earlies	22.2	24.7	23.4	19.1	13.0	102.4	110.0	110.4	94.9	77.1
<u>Sec. Earlies</u>										
C.R.	} 4.6	2.7	1.8	.9	.6	} 26.1	15.5	13.6	10.1	7.8
R.C.R.		3.0	2.3	2.2	2.5		14.5	16.0	16.5	16.2
U.D.	-	-	-	-	-	1.5	1.8	2.4	2.6	2.2
P.B.	-	-	-	.5	.5	-	-	-	3.7	3.8
Others	2.1	1.4	1.3	.8	.9	4.9	4.5	5.7	4.5	5.6
Total sec. earlies	6.7	7.1	5.4	4.4	4.5	32.5	36.3	37.7	37.4	35.6
<u>Maincrop (all var.)</u>	102.5	107.0	111.4	109.4	96.5	490.3	507.2	519.0	516.8	473.0
Total (all var.)	131.4	138.8	140.2	132.9	114.0	625.2	653.5	667.1	649.1	585.7

Abbreviations:-

A.P.	Arran Pilot	U.Pr.	Ulster Prince
Ep.	Epicure	C.R.	Craigs Royal
U.P.	Ulster Premier	U.D.	Ulster Dale
D. of Y.	Duke of York		
R.C.R.	Red Craigs Royal		
P.B.	Pentland Beauty		
H.G.	Home Guard		
U.Ch.	Ulster Chieftain		

Source:- Potato Marketing Board

Table 3

Seed acreages in Scotland - first and second early varieties					
	1962	1963	1964	1965	1966
<u>First Earlies</u>					
Arran Pilot	6714	7671	7599	5030	1675
Home Guard	2058	2528	2898	2149	1466
Ulster Chieftain	372	325	337	261	207
Ulster Premier	377	377	172	102	31
Ulster Prince	300	234	98	62	40
Red Ulster Premier	36	60	40	18	22
Pentland Envoy	3	7	15	16	12
Di Vernon	17	14	13	16	13
Ulster Dale	21	20	10	6	-
Epicure	1071	1324	965	818	319
Sharp's Express	268	341	390	387	272
Duke of York	345	318	229	377	202
Total	11582	13219	12766	9242	4259
<u>Second Earlies</u>					
Red Craigs Royal	2394	2562	1939	1661	1672
Craigs Royal	1796	1825	942	453	240
Pentland Beauty	156	276	504	468	435
Catriona	23	27	32	30	49
Dunbar Rover	18	21	20	13	65
Red Pentland Beauty	1	6	11	31	20
Total	4388	4717	3448	2656	2481

Source:- Department of Agriculture for Scotland.

APPENDIX C

Average results per acre - crops lifted by hand		
Item	1965	1966
	£	£
Output	138.1	192.3
<u>Variable costs</u>		
seed	22.2	21.8
fertiliser	10.4	9.3
casual labour	36.7	28.0
contract	.6	1.9
fuel	.7	.8
sundry	6.8	6.4
Total variable costs	77.4	68.2
Gross margin	60.7	124.1
<u>Other direct costs</u>		
regular labour	12.7	12.1
tractor	6.0	7.0
depreciation	7.9	5.7
	tons	tons
Yield per acre	10.4	8.7
<u>Labour and tractor work</u>	hrs	hrs
casual labour	132.6	111.9
regular labour	42.2	38.0
total labour	174.8	149.9
tractor	27.2	29.2
	No.	No.
Number of crops	14	8

Distribution of hours per acre								
Range	under 20	20-40	40-60	60-80	80-100	100-120	120-140	over 140
Casual labour								
1965				1		6	4	3
1966					2	3	2	1
Regular labour								
1965	3	1	9		1			
1966		5	3					
Range	under 100	100-120	120-140	140-160	160-180	180-200	over 200	
Total labour								
1965			1	1	6	4	2	
1966			4	1	3			
Range	under 20	20-30	30-40	40-50				
Tractor								
1965	3	6	3	2				
1966		5	3					

Distribution of costs and yields per acre - crops lifted by hand								
Range	£ under 5	£ 5- 10	£ 10- 15	£ 15- 20	£ 20- 25	£ 25- 30	£ 30- 35	£ over 35
Seed								
1965			3	5	1	2	1	2
1966			1	3	2		2	
Fertiliser								
1965		8	5	1				
1966		6	2					
Casual labour ¹ total								
1965					1	5	2	6
1966					4	1	2	1
Casual labour - lifting only								
1965			1	3	7			3
1966			2	4	2			
Sundry								
1965	7	4	2	1				
1966	3	4	1					
Regular labour ¹								
1965	2	1	8	2	1			
1966		1	5	2				
Tractor								
1965	5	9						
1966		8						
Depreciation ²								
1965	5	4	5					
1966	6		2					
Range	£ 40- 50	£ 50- 60	£ 60- 70	£ 70- 80	£ 80- 90	£ 90- 100	£ 100- 110	£ over 110
Variable costs								
1965		2	6	2		2	1	1
1966		1	3	4				
Range	£ under 50	£ 50- 70	£ 70- 90	£ 90- 110	£ 110- 130	£ 130- 150	£ 150- 170	£ over 170
Gross margin								
1965	5	3		5	1			
1966		1		2	3		1	1
Yield ³	ton	ton	ton	ton	ton	ton	ton	ton
Range	5-6	6-7	7-8	8-9	9-10	10-11	11-12	over 12
Tons per acre								
1965	1	1	1	1		2	5	3
1966		2	1	2	1	1	1	

Notes:-

- 1 High casual labour costs usually associated with lower regular labour costs.
- 2 Higher figures included irrigation equipment.
- 3 Yields per acre increased as the season progressed.

Average results per acre - crops lifted by harvester		
Item	1965	1966
	£	£
Output	157.4	210.0
<u>Variable costs</u>		
seed	18.6	24.0
fertiliser	11.1	10.9
casual labour	16.9	14.2
contract	1.8	1.0
fuel	.4	.6
sundry*	10.0	11.0
Total variable costs	58.8	61.7
Gross margin	98.6	148.3
<u>Other direct costs</u>		
regular labour	17.8	21.8
tractor	8.8	8.6
depreciation	11.0	12.6
	tons	tons
Yield per acre	9.9	8.1
<u>Labour and tractor work</u>		
	hrs	hrs
casual labour	69.1	55.6
regular labour	57.5	66.0
total labour	126.6	121.6
tractor	39.2	38.3
	No.	No.
Number of crops	7	8

* Higher sundry costs than for hand-lifted crops as more farmers bought their own paper bags.

Distribution of hours per acre								
Range	under 20	20-40	40-60	60-80	80-100	100-120	120-140	over 140
Casual labour								
1965			3	1	3			
1966		1	3	4				
Regular labour								
1965		1	4		2			
1966			1	7				
Range	under 100	100-120	120-140	140-160	160-180	180-200	over 200	
Total labour								
1965	2		3	1		1		
1966		3	5					
Range	under 20	20-30	30-40	40-50				
Tractor								
1965			4	3				
1966			4	4				

Distribution of costs and yields per acre - crops lifted by harvester								
Range	£ under 5	£ 5- 10	£ 10- 15	£ 15- 20	£ 20- 25	£ 25- 30	£ 30- 35	£ over 35
Seed								
1965			2	3	1	1		
1966				2	2	4		
Fertiliser								
1965		1	6					
1966			8					
Casual labour ¹								
total								
1965		1	2	2	1		1	
1966		1	2	5				
Casual labour - lifting only								
1965		6	1					
1966	3	5						
Sundry ²								
1965	2		5					
1966		2	5	1				
Regular labour ¹								
1965			4	1	1	1		
1966				3	3	2		
Tractor								
1965		6	1					
1966		7	1					
Depreciation ³								
1965		3	2	2				
1966		2	2	4				
Range	£ 40- 50	£ 50- 60	£ 60- 70	£ 70- 80	£ 80- 90			
Variable costs								
1965	1	2	4					
1966	1	3	2	2				
Range	£ under 50	£ 50- 70	£ 70- 90	£ 90- 110	£ 110- 130	£ 130- 150	£ 150- 170	£ over 170
Gross margin								
1965		1	1	3	1	1		
1966				1	1	2	3	1
Yield ⁴	ton	ton	ton	ton	ton	ton	ton	ton
Range	5-6	6-7	7-8	8-9	9-10	10-11	11-12	over 12
Tons per acre								
1965			1	2	1		2	1
1966		2	2	2	1	1		

Notes:-

- 1 High casual labour costs sometimes associated with lower regular labour costs.
- 2 Higher figures due to the purchase of paper bags.
- 3 Higher figures included irrigation equipment.
- 4 Yields per acre increased as the season progressed.

APPENDIX D

Farm Management Data

This section contains data for the preparation of budgets. By selecting the appropriate factors for the particular plan under review, it is hoped that a more accurate estimate of costs will be achieved than would be possible using average figures. It is emphasised that these figures are a guide only and it is preferable that local data be used if available.

Labour inputs have been discussed in the report on page 7 and graphs summarising the labour requirements for the two main systems of production - hand work and all mechanised systems - have been prepared. Capital profiles have also been prepared and are discussed on page 10 in the report. Both sections refer to the budget examples given in this appendix.

Price trends over the previous 5 years are discussed on page 11 in the report and the approximate yields required to provide a gross margin of £80 per acre are indicated on a weekly basis using the five year average price trend as a guide.

Guide to Depreciation Charges for Specialised Equipment

Implement	New price	Annual* charge	Charge per acre	
			30 ac.	60 ac.
	£	£	£	£
Triple driller	90	22	.7	.4
Planters:				
3 row automatic	310	75	2.5	1.3
3 row semi-automatic	200	48	1.6	.8
2 row semi-automatic	160	39	1.3	.7
3 row coverer	80	20	.7	.4
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
Tipping mechanism to handle boxes	150	36	1.2	.6
30 boxes @ £5	150	36	1.2	.6
Dressers				
small	300	72	2.4	1.2
large	500	120	4.0	2.0

* Annual charge includes interest @ 8% on half the new price. Scrap values have been ignored and the equipment written off in 5 years with the exception of the harvesters which have been given a 4 year life.

Chitting House

Minimum space required - 25 square feet per ton. This assumes that there are 60 boxes to the ton (measuring 6" x 18" x 30" each), stacked to a height of 7' 6" - 15 square feet for the boxes and allowing 10 square feet of free space for lights, etc.

Boxes - 60 per ton @ 6s.-7s. each - £18-£21 per ton. (10-12 year life can be expected).

Fluorescent lights - £8-£10 per unit. (Sufficient to light approximately 3 tons each).

Note relating to grant aid

In view of proposed changes in the rates of grant and in the range of items which may become eligible, the budgets on the following pages may require to be altered when the new regulations come into operation.

Adapting old buildings (See note on page x)

	£
Structural alterations	100
less 30% grant	30
	<hr/>
	70
Electrical (assuming building already connected to mains)	100
	<hr/>
Total	170
	<hr/>
Annual charge over 10 year life	17
Interest @ 8% on half of cost	7
	<hr/>
Total annual charge	24
	<hr/>
Annual charge per acre (20 acres)	1.2
Annual charge per ton (25 tons)	.95

New building (See note on page x)

Eligible for a 30% grant if approved.

Cost for building with cavity walls, insulated roof
and wide doors - £2 per square foot.

	£
Building to hold 25 tons	
25 tons @ £50 per ton	1250
less 30% grant	375
	<hr/>
	875
Electrical equipment and wiring	200
	<hr/>
Total	1075
	<hr/>
Annual charge over 10 year life	108
Interest @ 8% on half of £1075	43
	<hr/>
Total annual charge	151
	<hr/>
Annual charge per acre (20 acres)	7.5
Annual charge per ton (25 tons)	6.0

Irrigation equipment

Permanent works such as a bore-hole or underground main line, are
eligible for a 50% grant in Scotland.

	£
Bore-hole per foot	3-4
Reservoirs - wide range according to circumstances	
Permanent main line per yard - 6" asbestos	2
Portable main line per yard - 6" aluminum	2.2
Sprinkler line complete - to cover 1 acre per setting	270
Tractor driven pump	250
Diesel engine and pump	750

Irrigation system to cover 40 acres (See note on page x)

	£
150 feet of bore @ £4 per foot	600
200 yards of asbestos main line @ £2 per yard	400
	<hr/>
Total	1000
less 50% grant	500
	<hr/>
	500
400 yards of aluminum main line @ £2.2 per yard	880
Sprinkler line	270
Tractor driven pump	250
	<hr/>
Total	1900
	<hr/>
Total per acre (40 acres)	47.5
	<hr/>
Annual charge over 10 year life	190
Interest @ 8% on half of £1900	76
	<hr/>
Total annual charge	266
	<hr/>
Annual charge per acre (40 acres)	6.7

Outline of 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	3.4
Seed-bed cultivations	2	2	6.1
Drill and apply fertiliser	1	1	6.1
Planting - squad	11	-	4.7
carting	2	2	5.3
cover	1	1	6.5
3 row semi-automatic & cover	4	1	4.4
carting	2	1	8.0
Summer cultivations -			
harrow	1	1	18.0
grub	1	1	8.0
ridge	1	1	8.0
Weed spray	1	1	16.0
Blight spray	1	1	16.0
Pulverising	1	1	6.5
Hand lift and cart (1 row elevator digger)	23	3	1.9
Harvester and cart (£950)	9	3	1.3
			Approx. tonnage per day
Stacking or turning seed	3	-	10 tons
Dressing	6	-	14.5 "

Labour and tractor hours per acre

Period.	Operation	Typical ¹ hours (totals)	Typical team number and/or tractor number	Range in total hours 1965-1966
Autumn/ winter	Chitting - stacking and turning once	4-6/T.	2-3	.8-24.2
October- January	Dung handling (15 T.) tractor	4-6	2-3	2.4-11.4
	labour	6-8	3-4	2.4-13.0
	Ploughing (2 furrow)	2.3	1	1.6- 4.3
Mid Feb. Mid Mar.	Seed-bed cultivations (harrow, grub, rotovate)	2.5	1-2	.5-14.4
	Drill and apply fertiliser	1.3	1	.6- 2.4
	Cart seed & fertiliser hand plant - tractor	3.0	2	1.4- 3.3
	labour	3.0	2	1.4- 5.0
	machine plant - tractor	1.0	1-2	.2- 2.7
	labour	2.0	2	.8- 7.1
	Planting hand plant - reg. labour	3.4	2	nil- 5.3
	cas. labour	15.0	9	10.1-17.7 ²
	machine plant - 3 row semi- auto. (incl. covering) tractor	1.8	1	1.3- 3.0
	labour	7.2	dr. + 3	6.5-12.0
	Covering (mainly after hand work)	1.2	1	.3- 2.0
Mid Apr. -May	Summer cultivations	3.0	1	.8- 6.7
	Weed spray (per application)	.5	1	.3- .5
June- July	Blight spray (per application)	.5	1	.4- .6
	Pulverising	1.2	1	1.0- 2.2
	Lifting squad - 1 row el. digger	4.2	1	3.1- 8.0
	pickers	80.0	18-20	62.4-143.0 ²
	carting	4.2-8.4	1-2	3.6-17.3
	harvester - £950 (1 row)	6.3	.1	4.0- 8.5
	pickers	25.2-31.5	4-5	15.0-46.8 ²
	carting	12.6	2	9.7-17.0
	Dressing guide for 8 ton crop	3.2/T.	6	2.3- 5.5
	cas. labour	17.1	4	7.3-52.8 ²
	reg. labour	8.5	2	nil-25.6

Notes:-

- 1 The "team" hours can be calculated by dividing these figures by the approximate team number.
- 2 Approximate figures.

Typical costs per acre

Item	Typical	Range
	£	£
Seed - 23 cwt + 3 cwt to allow for losses over winter 26 cwt home-grown @ £16/T. 26 cwt bought-in @ £19/T. (these prices may vary considerably from year to year)	20.8) 24.7)	13.0-68.6*
Fertiliser - 8 to 9 cwt	10.5	7.9-16.0
Casual labour farm rate for women mixed squads (for planting, lifting and dressing, see report) transport	4s./hr. 4s.6d.- 5s./hr. 1.0	- 4s.1d.- 5s.4d./hr. nil- 2.2
Contract dung work - complete spreading only spraying weeds - varying with choice of compound and quantity applied spraying blight (per application) spraying down (acid)	6.0 1.3 2.0- 3.5 1.5 3.2	2.6- 6.0 1.1- 1.6 1.9- 3.7 .9- 1.6 3.2- 3.5
Fuel - chitting house - lights heaters dresser	.5 1.0 .2	.1- .7 .4- 1.5 .1- .3
Sundry P.M.B. levy crop lifted before 17th July crop lifted after 17th July boxes - 60 per ton @ 7d. each - 26 cwt weed spray - varying with choice of compound and quantity applied blight spray (per application) spraying down (diquat) paper bags - 6d. each repairs to digger (estimated) repairs to harvester (estimated)	1.0 3.0 2.3 2.0- 3.0 1.0 2.2 1.0/T. .7 1.5	- - 1.0- 4.1 1.4- 3.3 - - nil- 9.2
Regular labour - including employer's share of insurance, house, etc.	6s.9d./hr.	6s.5d.- 7s.5d./hr.
Rent	6.0	3.2- 7.0

* Including high losses in store.

Budget Examples

<u>System A</u>		<u>System B</u>		
Hand plant Traditional weed control Hand lift		Machine plant Chemical weed control Harvester		
Equipment required (depreciated over 30 acres)				
Implement	System A		System B	
	New price	Annual charge per acre	New price	Annual charge per acre
	£	£	£	£
Triple driller	90	.7	90	.7
3 row semi-automatic planter			200	1.6
3 row coverer	80	.7		
Pulveriser	200	1.6	200	1.6
1 row elevator digger	250	2.0		
1 row harvester			950	9.2
Dresser	300	2.4	300	2.4
Total (implements)	920	7.4	1740	15.5
Chitting house - adaptations*	200	1.2	200	1.2
Total outlay/annual charge	1120	8.6	1940	16.7

* Over 20 acres

Labour and tractor work per acre

Operation	System A			System B		
	Hours			Hours		
	Regular labour	Casual labour	Tractor	Regular labour	Casual labour	Tractor
Chitting work	6.0			6.0		
Dung work	8.0		6.0	8.0		6.0
Ploughing	2.3		2.3	2.3		2.3
Cultivations	2.5		2.5	2.5		2.5
Drill + fert.	1.3		1.3	1.3		1.3
Carting	3.0		3.0	2.0		1.0
Planting	3.4	15.0		) 1.8	5.4	1.8
Covering	1.2		1.2			
Cultivations	3.0		3.0			
Weed spray				.5		.5
Blight spray		contract		.5		.5
Pulverising	1.2		1.2	1.2		1.2
Lifting	4.2	80.0	4.2	6.3	31.5	6.3
Carting	8.4		8.4	12.6		12.6
Dressing (8 ton)	8.5	17.1		8.5	17.1	
Total	53.0	112.1	33.1	53.5	54.0	36.0
Cost per hour	6/9	4/6	4/6	6/9	4/6	4/6
Cost per acre	£17.9	£25.2	£7.4	£18.1	£12.1	£8.1

Budget Examples

Item	System A		System B	
	£	£	£	£
<u>Output</u>				
seed - 1 ton @ £20		20.0		20.0
ware - 7 tons @ £22		154.0		154.0
Total output		174.0		174.0
<u>Variable costs</u>				
seed - 26 cwt home-grown		20.8		20.8
fertiliser - 8 cwt		10.5		10.5
casual labour	25.2		12.1	
transport	<u>1.0</u>	26.2	<u>1.0</u>	13.1
contract - blight spray		1.5		-
fuel - chitting house lights	.5		.5	
dresser	<u>.2</u>	.7	<u>.2</u>	.7
sundry				
P.M.B. levy	2.0		2.0	
boxes	2.3		2.3	
sprays - weeds			3.0	
blight			1.0	
bags	7.0		7.0	
repairs - digger/harvester	<u>.7</u>	12.0	<u>1.5</u>	16.8
Total variable costs		71.7		61.9
Gross margin		102.3		112.1
<u>Fixed costs</u>				
regular labour		17.9		18.1
tractor depreciation & fuel		7.4		8.1
depreciation of specialised equipment		8.6		16.7
rent		6.0		6.0
share of overheads		26.1		22.6
Total fixed costs		66.0		71.5
Total costs		137.7		133.4
Estimated profit		36.3		40.6

Notes:-

- 1 The labour requirements for these examples are also shown on the graphs opposite page 10 in the report.
- 2 The variable costs are shown as capital profiles opposite page 11 in the report.

APPENDIX E

Standard Appendix

The figures in this appendix are based on 24 records covering 431 acres on 14 farms in 1965 and 19 crops covering 249 acres on 12 farms during 1966.

Table 1

Summary of average costs per acre				
Item of cost	Hours		1965	1966
	1965	1966	£	£
	Regular labour	47.9	49.1	14.8	16.3
Casual labour	105.3	77.4	28.4	19.6
Power - tractor	30.5	30.9	6.8	7.1
horse	-	-	-	-
machinery depreciation and repairs			9.6	10.1
contract services			1.6	4.8
other fuel			.6	.6
Materials - seed			21.5	24.5
fertiliser			10.4	10.0
sundry			5.9	6.0
P.M.B. levy			2.5	2.1
Rent			5.9	5.4
Market costs			-	-
Total direct costs			108.0	106.5
Share of general farm expenses			23.7	22.5
Adjustment for residual manurial values			-	-
Gross cost of production at delivery point			131.7	129.0

1000

1000

1000