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Potatoes - Cost of production

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POTATO COSTINGS, 1961 CROP

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CONTENTS

	<u>Page</u>
INTRODUCTION	1
SUMMARY OF RESULTS	3
THE WEATHER	4
VARIETIES AND YIELDS	4
GROWING THE CROP	
Place in rotation	6
Farmyard manure	6
Fertilisers	6
Seed	7
Blight precautions	7
Shaw destruction	7
Digging and lifting	7
Storing	8
Dressing	8
COSTS AND RETURNS	8
PROFITABILITY	12
LABOUR AND POWER	13
COSTING AND BUDGETING	13
COSTING METHOD AND CHARGES	14
APPENDIX	
Table I Maincrop production costs per acre	17
Table II Maincrop production costs by stages	18
Table Ia Seed potato production costs per acre	19
Table IIa Seed potato production costs by stages	20
Table III Some operation costs	21
STANDARD APPENDIX	
Table I Summary of average costs per acre	22
Table II Summary of average yields and returns	22
Table III Summary of average labour and power per acre	23
Table IV Summary of average quantities of materials used, etc.	23

INTRODUCTION

This report deals with the results obtained from the costings of thirty-six potato crops totalling 403½ acres on thirty-four farms in the province of this College. Ten of these farms were in Dunbartonshire, nine in Lanarkshire, eight in Stirlingshire, four in west Perthshire and three in Dumfriesshire.

Most of the report is about average figures from twenty costings of maincrop potatoes grown primarily for ware and generally stored or pitted before dressing and sale; but results are also given for eight crops grown mainly for seed. There is also information on three maincrops which were sold growing by the acre, on two maincrops sold straight off the field (green ware) and on three crops of early potatoes.

The main purpose of this study was to have up-to-date figures on the cost of growing potatoes in this area, as the last potato costing here was done seven years ago.[⌘] The returns per ton and per acre have also been calculated, but so far as prices are concerned it should at once be made quite clear that this turned out to be a most untypical year. From March, 1962 scarcity conditions prevailed and market prices soared. Seed potatoes, especially, sold for very high prices indeed.

There was a big drop in the acreages planted in 1961 (a result of two years' very low prices). The 136,000 acres planted in Scotland were the lowest acreage of potatoes since before the war and the tonnage available was down by about a quarter of a million on that of the year before. Nevertheless in the autumn of 1961 it was estimated that there might be sufficient maincrop potatoes available to last until the new potatoes reached the market. However, severe frosts and a long and cold winter and spring altered this. In some parts there was wastage of the old crop in the pits, the planting of the earlies was delayed and consumers seemed to want more potatoes. There was a similar situation on the continent and imports of potatoes from there into Britain were not forthcoming.

[⌘] Potato Costings, 1954 Crop. Grace Picken. Report No. 28, Economics Department, West of Scotland Agricultural College, Glasgow, November 1955.

Figures for Scotland for the last four years are as follows:-

<u>Crop Year</u>	<u>Acreage</u>	<u>Yield(tons)</u>	<u>Market Prices</u>
1958	147,000	1,002,000	High
1959	150,000	1,391,000	Very Low
1960	152,000	1,354,000	Very Low
1961	136,000	1,125,000	Very High

Because of the relatively low price elasticity of demand for potatoes - the consumer will generally buy much the same quantities whether prices are high or low - even a small shortage in supplies causes prices to rise. Similarly even a small surplus in supplies causes a drop in prices. The growing of potatoes, therefore, is to some extent a speculative business. For the longer term view on potato prices, it is the average price level over several years rather than the price received in a given year that should be considered.

In a year of normal weather, production costs with one important exception, are not liable to such fluctuations. The exception is the cost of seed which can vary considerably from year to year. For example the seed bought to plant for the 1961 crop, cost on average in the maincrop sample just over £16 per ton, whereas seed for the 1962 planting cost in the region of £30 per ton. This means that at a planting rate of one ton to the acre, the 1962 potato crop started with a cost increase of £14 per acre over the 1961 crop.

There is also the continuing uncertainty about the labour position, particularly for lifting the crop. In time, a complete harvester able to work in different soil conditions and on sloping fields will solve this problem. For the present, however, farms which can still grow good potato crops but are not well placed for obtaining casual workers rely more and more on the buying merchant to provide the lifting squad. Often the dressing of the potatoes is also done by the merchant. In fact on quite a number of places now, the farmer finds it more suitable to leave the growing of the crop to the merchant and to let out his potato land by the acre.

Grateful acknowledgement is made of the help received from the farmers who kindly co-operated by keeping cost records.

SUMMARY OF RESULTS

All direct and indirect costs are charged including overheads (share of general farm expenses), rent and work of farmer and family to give Gross Cost. An adjustment is made to this Gross Cost for the residual value of manures and for brock potatoes (chats and damaged tubers) to give the Net Cost.

The term Returns means the revenue from all ware and seed sold plus the value of any potatoes on hand.

The difference between Returns and Net Cost is called the Surplus.

Crop type	<u>Maincrop</u>	<u>Seed</u>	<u>Earlies</u>	<u>Green Ware</u>	<u>Sold Growing</u>
Number of costs	20	8	3	2	3
Acreage costed	188½	132	36	17	29¾
<u>Average per acre</u>					
Yield (tons)	7.3	9.0	4.4	10.1	Not available
	£	£	£	£	£
Returns	142	195	100	151	120
Net Cost	95	107	68	75	63
Surplus	47	88	32	76	57
Lifting and storing costs	20	24	15	22	Not available
<u>Average per ton</u>	£	£	£	£	£
Returns	19.5	21.7	22.6	15.1	Not available
Net Cost	13.1	11.9	15.4	7.5	Not available
Surplus	6.4	9.8	7.2	7.6	Not available
Dressing costs	1.1	1.3	-	-	-

Labour and power

The average hours worked per acre for the 20 Maincrop costings were:-

<u>20 Maincrop only</u>	<u>Farm Staff</u>	<u>Casual</u>	<u>Contract</u>	<u>Horse</u>	<u>Tractor</u>
Pre-harvest	31.0	7.2	0.1	-	25.9
Lifting and storing	14.8	76.8	0.4	0.5	12.1
Dressing	20.2	11.9	-	-	0.7
	<u>66.0</u>	<u>95.9</u>	<u>0.5</u>	<u>0.5</u>	<u>38.7</u>

Labour squads supplied by merchant or institutions have been included with casual. The hours of workers employed on contract with hired machinery services are shown under Contract.

THE WEATHER

When everything is considered, the weather still remains the most important factor affecting the planting, growth and harvesting of crops. It may be remembered that the 1960 potato crop was finally lifted in appalling conditions in many places. This had its effect on the 1961 crop, because seed, while cheap to buy due to a surplus, was in some cases of poor quality as a result of the damp sodden conditions under which it had been harvested. The general consensus of opinion among those who took part in this costing was that the weather in 1961 was not particularly favourable to potato growing. Those with earlies found that the ground did not really dry out properly at planting time. Growth was later hampered by the very dry conditions which followed in late May and June. Some others with maincrop potatoes had to delay planting because of the wet spring. On the whole crops in this sample were rather on the light side, although one or two growers had very satisfactory yields. Rain at lifting time meant broken working on some of the farms, and in a few cases there was some rotting of potatoes in the pits with consequent difficulties in dressing and sorting.

VARIETIES AND YIELDS

Of 36 costings covering $403\frac{1}{4}$ acres, 3 costings totalling $29\frac{3}{4}$ acres were for ware crops sold growing by the acre - 21 acres of Redskin and $8\frac{3}{4}$ acres of Kerr's Pink. When these 3 costings are set aside, the remaining $373\frac{1}{2}$ acres can be divided into the categories in the table below according to crop type and potato variety. Green ware refers to crops which are lifted at the beginning of the maincrop season and sold straight off the field. Average yields per acre are also shown.

	<u>Main</u> <u>Crop</u>	<u>Grown</u> <u>for Seed</u>	<u>Earlies and</u> <u>dug early</u>	<u>Green</u> <u>Ware</u>	<u>Total</u>		
Number of costs	20	8	3	2	33		
<u>VARIETY</u>					<u>Total</u> <u>Acreage</u>	<u>Average</u> <u>Yield/Acre</u>	
Redskin	79	18	$10\frac{1}{2}$	-	$107\frac{1}{2}$	7.35 tons	
Kerr's Pink	86	$4\frac{1}{2}$	-	16	$106\frac{1}{2}$	8.34 "	
Majestic	-	$57\frac{1}{2}$	-	-	$57\frac{1}{2}$	8.23 "	
Arran Pilot	-	46	-	-	46	8.40 "	
Golden Wonder	$23\frac{1}{2}$	-	-	1	$24\frac{1}{2}$	7.42 "	
Home Guard	-	5	$15\frac{1}{2}$	-	$20\frac{1}{2}$	5.66 "	
Epicure	-	-	10	-	10	3.94 "	
Ulster Prince	-	1	-	-	1	8.00 "	
Total acreage	<u>$188\frac{1}{2}$</u>	<u>132</u>	<u>36</u>	<u>17</u>	<u>$373\frac{1}{2}$</u>		
Av.yield/acre(tons)	7.26	8.97	4.42	10.06	7.72		

The average yield of 7.26 tons per acre from the 20 main crop costings was made up of 6.49 tons of ware and 0.77 tons of seed. In addition to this there was an estimated 0.51 tons of brock per acre. This rather low average yield per acre was due to some extent to a virtual crop failure of 11 acres of Redskin and to patchy seed in other cases.

The average yield of 8.97 tons per acre for the 8 crops grown primarily for seed was made up of 3.49 tons of ware and 5.48 tons of seed. There was in addition to this an estimated 0.71 tons of brock per acre. The farms in this last group were all on land and in areas favourable to the growing of potatoes, and the somewhat higher yield per acre may be attributed in some measure to this.

The range of yield was from 2.38 tons per acre for a small field of earlies which were a failure, to 12.68 tons per acre for a costing of Majestic and Redskin which was classified with the seed group although a good proportion of the Redskin went as ware.

The table below shows the distribution.

<u>Average Yield per Acre</u>	<u>Main Crop</u>	<u>Grown for Seed</u>	<u>Earlies and dug early</u>	<u>Green Ware</u>
Over 12 tons	-	1	-	-
10 to 11.9 tons	1	3	-	1
8 to 9.9 tons	7	2	-	1
6 to 7.9 tons	7	1	-	-
4 to 5.9 tons	5	1	2	-
2 to 3.9 tons	-	-	1	-
	<u>20</u>	<u>8</u>	<u>3</u>	<u>2</u>

GROWING THE CROP

<u>Place in rotation</u>	<u>Maincrop</u>	<u>Seed</u>	<u>Earlies</u>	<u>Green Ware</u>	<u>Sold Growing</u>
Following					
Grain	15	4	-	-	2
Grass	5	4	3	2	1

In two of the maincrop and one of the seed costings a small part of the acreage of potatoes costed was taken after turnips.

Farmyard manure

20 Maincrop

Out of a total of $188\frac{1}{2}$ acres for the 20 crops costed, the area actually dunged was $147\frac{1}{2}$ acres - a rate of dunging of $15\frac{3}{4}$ tons per acre actually dressed. Two of the crops costed received no dung at all.

8 Seed

81 acres out of a total of 132 costed in 8 costings were dunged at an average rate of $16\frac{3}{4}$ tons per acre actually dressed. Again two of the crops costed received no dung at all.

The rate of dunging per acre actually dressed worked out at 11 tons, 9 tons and $17\frac{1}{4}$ tons for the Earlies, Green ware and Sold growing crops respectively.

On most of the costed areas farmyard manure was mechanically spread, twenty-four records showing that a muck spreader was used.

Fertilisers

In all cases compound potato fertilisers were used and every part of the area costed received a dressing.

The average weight of compound fertilisers applied per acre are shown below:-

<u>Maincrop</u>	<u>Seed</u>	<u>Earlies</u>	<u>Green Ware</u>	<u>Sold Growing</u>
$11\frac{3}{4}$ cwt.	$8\frac{1}{4}$ cwt.	8 cwt.	$9\frac{1}{2}$ cwt.	15 cwt.

Fertilisers were all machine spread, but for five of the costings there was combined placement of fertiliser and planting of seed.

Seed

This was not boxed except for the earlies and for a very small part of one maincrop planting.

The average rates of planting are shown below:-

<u>Type</u>	<u>cwt. per acre</u>	<u>% purchased</u>
20 Maincrop	18.2	39
8 Seed	36.7	2
3 Earlies	19.0	96
2 Green ware	19.7	24
3 Sold growing	21.8	100

The planting was most commonly carried out by machine by means of an attachment to the ridging bodies. Twenty-one of the crops were planted in this way. There was for five others a fertiliser attachment so that both seed and fertiliser were placed at the same time. The remaining ten crops were planted by hand, five of these being among the eight crops grown mainly for seed.

Blight precaution

The three Dumfriesshire crops were all treated against disease: contract dusting on one, contract spraying on the second and a farm sprayer on the third.

Shaw destruction

For four of the crops the shaws were burned down by contract spraying and for three others destruction was by contract pulverising. In addition the farmer carried out his own shaw destruction for seven crops, generally by flailing chain or swiping attachment.

Digging and lifting

The spinner was still the commonest type of digger used. Thirty-one of the crops were dug by spinner. The remaining five were dug by elevator digger.

Lifting squads were in most cases made up of casual workers each paid individually by the farmer; but for two crops lifting was done by institutional labour for a contract price on an acreage basis.

On five farms the merchant who was buying the potatoes provided the lifting squad, but the farmer dug and carted. On one farm the complete harvesting of the crop was done by the merchant who provided digger, tractors and all labour.

Storing

Ten of the twenty maincrops and four of the eight seed potato crops were clamped in pits. The use of sheds, however, is becoming commoner now and seven maincrops and three seed potato crops were stored in this way. For only one of these could the sheds used really be classed as buildings specifically adapted for the storage of potatoes. For the others empty shed space was being utilised.

In addition three maincrops were pitted but with a certain proportion of the crop being taken straight to the steading for dressing in sheds.

The remaining seed crop which was lifted by the merchant by contract was taken straight off the field.

Dressing

In nine cases the merchant did the dressing, bringing his own sorting machine and squad, but usually receiving some help from the farmer. On one farm all the dressing was completely done by the merchant but on the majority of the farms in this sample, the regular farm staff, supplemented as required by casual workers, carried out the dressing themselves.

COSTS AND RETURNS

COSTS

The costs of growing the crops in this sample varied considerably, both per acre and per ton. As might be expected, the crops sold growing by the acre had the lowest costs since there was no lifting or dressing to be done. The average net cost for this small group of three was £63 per acre.

The earlies had the next average lowest cost of £68 per acre for a group of three and the two green ware crops cost £75 per acre.

For the twenty costings of maincrop potatoes the average net cost per acre was £95. There was a very wide range of from £69 to £135 in this group, due mainly to differences in labour and power requirements, with a corresponding effect on overhead costs since these are calculated per £ of labour and per tractor-equivalent hour. Generally the lower costs were associated with lower yields resulting in fewer potatoes to lift and dress. Again some crops required less cultivation or were not given so many inter-row grubblings, etc. as others, which also meant lower labour and power costs.

Whether or not farmyard manure was applied also had a bearing on costs.

At the other end of the range, the highest cost was of a small field where the crop was pitted and then sold off in small amounts later. In another instance, bad weather conditions complicated the harvest, and disease in the stored crop caused a great deal of extra work at dressing time.

For the eight crops grown for seed, the average net cost per acre was £107 and the range was from £89 to £121. The lowest cost was for a crop grown on very easily worked, level land.

Compared with the maincrop, this group had higher seed costs per acre due to a heavier rate of planting. There was also naturally more roguing and inspection. Dressing costs were also higher, partly because the crop was on average heavier and also because the seed for sale required extra careful sorting.

The table below shows the distribution of cost per acre.

<u>Average net cost per acre</u>	<u>Main Crop</u>	<u>Grown for seed</u>	<u>Earlies and dug early</u>	<u>Green Ware</u>	<u>Sold Growing</u>
Over £120	2	1	-	-	-
£110-£119.9	1	1	-	-	-
£100-£109.9	2	4	-	-	-
£ 90-£ 99.9	7	1	-	-	-
£ 80-£ 89.9	4	1	-	1	-
£ 70-£ 79.9	3	-	1	-	-
£ 60-£ 69.9	1	-	2	1	2
Under £60	-	-	-	-	1
	<u>20</u>	<u>8</u>	<u>3</u>	<u>2</u>	<u>3</u>

When expressed per ton these costs varied from £7 for a crop sold as green ware, which yielded 11.7 tons per acre, to almost £29 for a small field of earlies which yielded only about $2\frac{1}{2}$ tons per acre.

The average costs per ton were £13.1 for the maincrop, £11.9 for the seed, £15.4 for the earlies and £7.5 for the green ware related to yields per acre of 7.3, 9.0, 4.4 and 10.1 tons respectively.

The table below shows the distribution of costs per ton.

<u>Average net cost per ton</u>	<u>Main Crop</u>	<u>Grown for Seed</u>	<u>Earlies and dug early</u>	<u>Green Ware</u>
Over £28	-	-	1	-
£24-£27.9	-	1	-	-
£20-£23.9	2	-	-	-
£16-£19.9	4	-	-	-
£12-£15.9	5	1	2	-
£10-£11.9	7	3	-	-
£ 8-£ 9.9	2	3	-	1
Under £8	-	-	-	1
	<u>20</u>	<u>8</u>	<u>3</u>	<u>2</u>

RETURNS

There were wide variations in the returns from the crop. These returns depend on the yield per acre and on the price received per ton. The differences in yield have been discussed in an earlier section and it is well known that prices varied considerably according to the time of year when the potatoes were sold.

With the earlies there was a light yield but a higher price. As the maincrop came on to the market, prices moved downwards.

For example Epicures in July and August were selling for over £20 per ton. The Redskins dug early and sold green came on at about £18 per ton in mid-August, but had dropped to £14-£15 by mid-September, and this was approximately the price up till the end of November for Kerr's Pink as well. The Majestic and Arran Pilot white ware was fetching about £11 at this time. Kerr's Pink and Redskin were at about £16 to £18 from early December until the end of February. It was in March and April that the prices moved upwards when the scarcity began to make itself felt - £20 at the beginning of March, £30 at the beginning of April, and for the small quantities still left at the beginning of May, £38. These latter are quotations from the Perth Market for Kerr's Pink and Redskin.

The sale price of seed followed much the same pattern.

In the sample studied here, the average returns per ton ranged from £15 to £33. The highest was for a crop grown for seed and sold fairly late on in the spring. The lowest, as it happened, was also for a crop grown for seed but where three-fifths were sold as white ware at about £11 per ton. The remaining two-fifths made £20 per ton as seed sold at an earlier date.

The average returns per ton for each group were £19.5 for the maincrop, £21.7 for the seed, £22.6 for the earlies and £15.1 for the green ware.

<u>Average net returns per ton</u>	<u>Main Crop</u>	<u>Grown for Seed</u>	<u>Earlies and dug early</u>	<u>Green Ware</u>
Over £30	-	1	-	-
£25-£29.9	2	1	1	-
£20-£24.9	5	2	2	-
£18-£19.9	5	2	-	-
£16-£17.9	6	-	-	-
£14-£15.9	2	2	-	2
	<u>20</u>	<u>8</u>	<u>3</u>	<u>2</u>

When expressed per acre, these returns averaged £142 for the maincrop, £195 for the seed, £100 for the earlies, £151 for the green ware and £120 for the crops sold growing.

The range here was from £48 per acre for a small field of earlies which was a failure to £334 per acre for a good crop of seed sold later in the spring of 1962.

The distribution of the returns per acre is given below.

<u>Average net return per acre</u>	<u>Main Crop</u>	<u>Grown for Seed</u>	<u>Earlies and dug early</u>	<u>Green Ware</u>	<u>Sold Growing</u>
Over £300	-	1	-	-	-
£250-£299	-	1	-	-	-
£200-£249	3	3	-	-	-
£150-£199	5	1	-	1	1
£100-£149	8	1	1	1	1
£ 75-£ 99	4	-	1	-	1
£ 50-£ 74	-	1	-	-	-
Under £50	-	-	1	-	-
	<u>20</u>	<u>8</u>	<u>3</u>	<u>2</u>	<u>3</u>

PROFITABILITY

As may be expected after the considerable range in yields, prices and growing costs, profitability varied widely too, from a high surplus of £226 per acre for a seed crop to a deficit of £44 for another seed crop where there was a large proportion of white ware and sub-standard ware which had to be considered as brock.

There were two other deficits, one among the earlies, where there was a failure of a small field of Epicures and the other in a maincrop which had high working costs and losses during storage.

The distribution of surplus per acre is shown below. It should again be remembered that this was a year when prices rose to a very high level.

<u>Average surplus per acre</u>	<u>Main Crop</u>	<u>Grown for seed</u>	<u>Earlies and dug early</u>	<u>Green Ware</u>	<u>Sold Growing</u>
Over £200	-	1	-	-	-
£150-£199	-	1	-	-	-
£100-£149	3	2	-	-	1
£ 50-£ 99	5	2	-	2	-
Under £50	11	1	2	-	2
Loss £1 -£24	1	-	1	-	-
£25-£50	-	1	-	-	-
	<u>20</u>	<u>8</u>	<u>3</u>	<u>2</u>	<u>3</u>

Expressed per ton, the surplus was again highest for the same seed crop at £22 and the lowest deficit was for the same other seed crop at nearly £10 per ton. The early failure also showed a deficit as did the one maincrop.

The table below shows the distribution.

<u>Average surplus per ton</u>	<u>Main Crop</u>	<u>Grown for seed</u>	<u>Earlies and dug early</u>	<u>Green Ware</u>
Over £20	-	1	-	-
£15-£19.9	1	1	-	-
£10-£14.9	2	2	-	-
£ 8-£ 9.9	4	1	1	-
£ 6-£ 7.9	2	1	1	2
£ 4-£ 5.9	5	1	-	-
Under £4	5	-	-	-
Loss £1-£4.9	1	-	-	-
£5-£10	-	1	1	-
	<u>20</u>	<u>8</u>	<u>3</u>	<u>2</u>

As mentioned earlier in the report, the crops in this sample were generally on the light side, but it was on the whole a profitable year for potato growers, especially for those who were able to hold on to their crop and sell later.

LABOUR AND POWER

It is well known that the potato crop is one which requires more labour and power than any other crop normally grown on farms. Also, labour and power taken together make up the largest single item of cost.

In the maincrop group in this sample, £39 out of a total net cost of £95 were for labour and power including any contract services. It should be noted that in the tables in the Appendix, merchants' squads and labour from institutions are included with casual and gang labour. The item of contract services refers to the hire of a machine and its operator under contract, e.g. contract spraying.

For the seed group, the comparable labour and power cost was £47 out of a total net cost of £107.

The extract below shows how these labour and power costs are made up. The figures given are averages per acre.

	<u>20 Maincrop</u>		<u>8 Seed</u>	
	<u>Hours</u>	<u>£</u>	<u>Hours</u>	<u>£</u>
Regular labour	66.04	15.08	72.21	16.29
Casual and gang	95.93	15.21	116.95	19.01
Power: tractor	38.67	8.70	31.71	7.14
horse	0.51	0.05	-	-
Contract services	0.54 [±]	0.32	2.70 [±]	4.95
		<u>39.36</u>		<u>47.39</u>

[±] hours estimated

In Table III in the Appendix, the various jobs have been analysed separately and man hours, tractor hours and costs per operational acre are shown.

COSTING AND BUDGETING

The first two tables in the Appendix (I and II for the Maincrop and Ia and IIa for the Seed) show the average production costs per acre.

Tables I and Ia show the cost structure in such a way that all the direct "out of pocket" expenses appear first. These total £43 for the maincrops and £56 for the seed crops. Farmyard manure and its application is shown separately.

In Tables II and IIa the cost structure is by stage totals. The intention is to show how a grower by keeping his own record in this form might be able to have some guide as to whether he should sell the crop growing, straight off the field, or store it.

COSTING METHOD AND CHARGES

METHOD

In this type of investigation (enterprise costing), certain costs have to be estimated. These estimated costs include the rates used per hour for horse and tractor work, the charge for work done on the crop by the farmer or members of his family, the cost of any home-grown seed potatoes and the cost of home-grown straw used for pitting the potatoes. The cost of home-grown seed and home-grown straw has been based on the farmer's estimate of their approximate market value. Potatoes on hand at the end have been similarly valued. Actual costs are used where these are known e.g. purchased fertilisers and seed, payments to the Potato Marketing Board, spray materials, contract work and wages to hired labour.

In those cases where, for example, a merchant has done the dressing of the potatoes, the charge for this has not been netted against the sale price of the potatoes but has been included with the labour costs, and an estimate made for the number of hours worked by the merchant's squad.

The rent charge is based on the rental value of the area costed, calculated from the per acre rent of the farm. For owner-occupied farms it has been based on the Gross Annual Value.

The calculation of manurial residues "Adjustment for residues" is based on the Advisory Leaflet, "Residual Values of Fertilizers and Feeding Stuffs" issued by the Department of Agriculture for Scotland.

The value of residues from lea is based on the estimated grass seed costs and the number of years in lea; the older the turf ploughed in the greater the value of grass residues.

Farmyard manure is charged at an estimated cost of 17/6d. per ton at steading or midden.

The entry Depreciation (special machinery) covers depreciation not included in the overhead charge, e.g. potato planters, spraying machines and potato dressing and sorting machines.

The terms "Share of General Farm Expenses" and "Overheads" have the same meaning.

These overhead expenses are difficult to estimate, since neither the complete financial accounts for the farms nor information as to the sharing of the overheads between the different enterprises on the farm, is available. The overhead figures which have been used are based on a general average obtained from a sample of financial accounts of Scottish farms, and this is applied to the crop costings in proportion to the labour costs, to the number of tractor and horse hours (tractor-equivalent hours), and to the acreage used for the crop. The result of this is to give an overhead charge based on a national (Scottish) average instead of on the figures for each individual farm. The rates charged for overheads are shown in the section on charges.

CHARGES

A summary of charges is given below:-

Labour Hired workers at actual hourly rates paid, calculated for each costing from a representative weekly wage (including employer's share of National Insurance and any perquisites, board and lodgings, etc. received) and from the average hours worked during a week with the addition of 7%, approximately 4d per hour, to allow for holiday time, sick time, etc. over the year. Overtime rates were charged where applicable.

Family labour at the following hourly rates:-

Farmer	4/8d.	Wife	3/4d.
Sons over 20 years	4/8d.	Daughters over 21 years	3/4d.
Sons 18-20 years	3/9d.	Daughters 18-21 years	3/-
Sons up to 18 years	2/2d.	Daughters up to 18 years	2/2d.

Horse work (excluding horseman) 2/- per hour

Tractor work (excluding driver) 4/6d. per hour

Overheads

	<u>Rate charged</u>	
	<u>Dairy Farms</u>	<u>Other Farms</u>
For each £ of labour used	7/-	7/6d.
For each tractor-equivalent hour (tractor hours plus one-quarter of the horse hours)	9/3d.	5/3d.
For each acre costed	10/9d.	9/9d.

The share of the general farm expenses which it is estimated should be borne by the potato crop is covered by these three overhead charges which allow for the following items.

1. The share of the farm bill for wages, fuel, light and power, and for tractor depreciation and repairs which cannot be allocated to any particular crop or department.
2. A share of car running expenses and depreciation.
3. A share of miscellaneous farm expenses.
4. A share of repairs to buildings, fences and drains.
5. Shares of implement repairs, rates, insurance and depreciation on tenant's fixtures and normal farm implements.

TABLE I
MAINCROP POTATO COSTINGS - 1961 CROP
PRODUCTION COSTS PER ACRE
AVERAGES FROM 20 CROPS
(Money figures in £'s decimal)

	£	£
11.07 cwt. home-grown seed	6.78	
7.08 cwt. purchased seed	<u>5.81</u>	12.59
11.71 cwt. fertilisers		11.25
Box replacement	0.04	
P.M.B. levy and excess acreage payment	1.58	
Basket replacement	0.32	
Straw for pits etc.	1.65	
Twine for tying sacks	0.03	
Fuel and power for sorting machine	0.07	
Meals and transport etc. for casual labour	<u>0.32</u>	4.01
<u>Non farm labour and power (excl. dung work)</u>		
Contract work (incl. any materials)	0.23	
95.26 hours casual labour	<u>15.10</u>	<u>15.33</u>
TOTAL OF ABOVE		43.18
Rent		1.91
Depreciation (special machinery)		0.52
<u>Farm labour and power (excl. dung work)</u>		
57.90 hours labour	13.20	
31.41 hours tractor	7.07	
0.51 hours horse	<u>0.05</u>	20.32
Overheads (excl. those on dung work)		23.88
<u>Farmyard manure and application</u>		
12.32 tons dung	10.51	
8.14 hours farm labour	1.88	
7.26 hours tractor	1.63	
0.67 hours casual labour	0.11	
Contract work	<u>0.09</u>	14.22
Overheads on dung work		<u>3.81</u>
GROSS COST		107.84
Adjustment for residues		(-) 10.87
Credit for brock etc.		(-) <u>1.80</u>
NET COST		<u>95.17</u>

The calculation for the adjustment for residues is shown below.

<u>Add from previous crops:-</u>		
Dung and application	0.07	
Lime	0.14	
Phosphates	0.05	
Compounds	0.67	
Grass residues	<u>0.97</u>	(+)
<u>Less to future crops:-</u>		
Dung and application	9.02	
Compounds	<u>3.75</u>	(-) <u>12.77</u>
Net Adjustment		(-) 10.87

TABLE II
MAINCROP POTATO COSTINGS - 1961 CROP
PRODUCTION COSTS PER ACRE BY STAGES
AVERAGES FROM 20 CROPS
(Money figures in £'s decimal)

	<u>ITEMISED</u> <u>COSTS</u>	<u>STAGE</u> <u>TOTALS</u>	<u>CUMULATIVE</u> <u>TOTALS</u>	
<u>FARMYARD MANURE AND APPLICATION</u>	£	£	£	
12.32 tons dung	10.51			
8.81 hours labour	1.99			
7.26 hours tractor	1.63			
Contract work	<u>0.09</u>	14.22	14.22	DUNG NOW SPREAD
<u>SEED, FERTILISERS AND FIELDWORK</u>				
11.07 cwt. home-grown seed	6.78			
7.08 cwt. purchased seed	5.81			
11.71 cwt. fertilisers	11.25			
19.43 hours labour	4.00			
11.11 hours tractor	2.50			
Sundries	0.06			
Depreciation on special machinery	<u>0.20</u>	30.60	44.82	CROP NOW PLANTED
<u>SUMMER CULTIVATIONS, ETC.</u>				
9.99 hours labour	2.21			
7.52 hours tractor	1.69			
Sundries	-			
Depreciation on special machinery	<u>-</u>	3.90	48.72	CROP READY TO HARVEST
<u>HARVESTING, LIFTING AND PITTING</u>				
91.61 hours labour	14.92			
12.08 hours tractor	2.72			
0.51 hours horse	0.05			
Contract work	0.23			
Sundries	2.23			
Depreciation on special machinery	<u>0.02</u>	20.17	68.89	CROP SECURED
<u>DRESSING AND SORTING, ETC.</u>				
32.13 hours labour	7.17			
0.70 hours tractor	0.16			
Sundries	0.07			
Fuel and power for sorting machine	0.07			
Depreciation on special machinery	<u>0.30</u>	7.77	76.66	CROP DRESSED FOR SALE
RENT		1.91		
P.M.B. LEVY AND EXCESS ACREAGE PAYMENTS		1.58		
<u>OVERHEADS</u>				
Dung work only: per £ labour	0.71			
per T.E. hour	<u>3.10</u>	3.81		
All other work: per acre	0.52			
per £ labour	10.13			
per T.E. hour	<u>13.23</u>	23.88		
GROSS COST		107.84	107.84	GROSS COST
Adjustment for residues		(-) 10.87	(-) 10.87	
Credit for brock, etc.		(-) 1.80	(-) 1.80	
NET COST		<u>95.17</u>	<u>95.17</u>	NET COST

TABLE IA
SEED POTATO COSTINGS - 1961 CROP
PRODUCTION COSTS PER ACRE
AVERAGES FROM 8 CROPS
(Money figures in £'s decimal)

	£	£
36.11 cwt. home-grown seed	19.93	
0.61 cwt. purchased seed	<u>0.72</u>	20.65
8.18 cwt. fertilisers		6.96
P.M.B. levy and excess acreage payment	1.30	
Measurement and inspection	0.53	
Sprays, dusts etc.	0.31	
Basket replacement	0.16	
Straw for pits etc.	1.35	
Twine for tying sacks	0.03	
Sealing fee	0.08	
Fuel and power for sorting machine	0.08	
Meals and transport etc. for casual labour	<u>0.37</u>	4.21
<u>Non farm labour and power (excl. dung work)</u>		
Contract work (incl. any materials)	4.94	
115.44 hours casual labour	<u>18.79</u>	<u>23.73</u>
TOTAL OF ABOVE		55.55
Rent		1.81
Depreciation (special machinery)		1.00
<u>Farm labour and power (excl. dung work)</u>		
66.76 hours labour	14.94	
27.30 hours tractor	<u>6.15</u>	21.09
Overheads (excl. those on dung work)		22.84
<u>Farmyard manure and application</u>		
10.27 tons dung	8.99	
5.45 hours farm labour	1.35	
4.41 hours tractor	0.99	
1.51 hours casual labour	0.22	
Contract work	<u>0.01</u>	11.56
Overheads on dung work		<u>1.88</u>
GROSS COST		115.73
Adjustment for residues		(-) 6.92
Credit for brock etc.		(-) <u>2.16</u>
NET COST		<u>106.65</u>

The calculation for the adjustment for residues is shown below.

Add from previous crops:-

Dung and application	0.07	
Lime	0.27	
Compounds	0.48	
Grass residues	<u>1.30</u>	(+) 2.12
<u>Less to future crops:-</u>		
Dung and application	6.72	
Compounds	<u>2.32</u>	(-) <u>9.04</u>
Net adjustment		(-) 6.92

TABLE IIA
SEED POTATO COSTINGS - 1961 CROP
PRODUCTION COSTS PER ACRE BY STAGES
AVERAGES FROM 8 CROPS
(Money figures in £'s decimal)

	<u>ITEMISED</u> <u>COSTS</u>	<u>STAGE</u> <u>TOTALS</u>	<u>CUMULATIVE</u> <u>TOTALS</u>	
	£	£	£	
<u>FARMYARD MANURE AND APPLICATION</u>				
10.27 tons dung	8.99			
6.96 hours labour	1.57			
4.41 hours tractor	0.99			
Contract work	<u>0.01</u>	11.56	11.56	DUNG NOW SPREAD
<u>SEED, FERTILISERS AND FIELDWORK</u>				
36.11 cwt. home-grown seed	19.93			
0.61 cwt. purchased seed	0.72			
8.18 cwt. fertilisers	6.96			
25.26 hours labour	4.65			
10.31 hours tractor	2.32			
Sundries	0.01			
Depreciation on special machinery	<u>0.14</u>	34.73	46.29	CROP NOW PLANTED
<u>SUMMER CULTIVATIONS ETC.</u>				
7.06 hours labour	1.72			
5.14 hours tractor	1.16			
Contract work	1.74			
Sundries	1.03			
Depreciation on special machinery	<u>0.12</u>	5.77	52.06	CROP READY TO HARVEST
<u>HARVESTING, LIFTING AND PITTING</u>				
108.71 hours labour	17.02			
10.92 hours tractor	2.46			
Contract work	3.20			
Sundries	1.68			
Depreciation on special machinery	<u>0.10</u>	24.46	76.52	CROP SECURED
<u>DRESSING AND SORTING, ETC.</u>				
41.17 hours labour	10.34			
0.93 hours tractor	0.21			
Sundries	0.11			
Fuel and power for sorting machine	0.08			
Depreciation on special machinery	<u>0.64</u>	11.38	87.90	CROP DRESSED FOR SALE
RENT		1.81		
P.M.B. LEVY AND EXCESS ACREAGE PAYMENTS		1.30		
<u>OVERHEADS</u>				
Dung work only: per £ labour	0.57			
per T.E. hour	<u>1.31</u>	1.88		
All other work: per acre	0.51			
per £ labour	12.33			
per T.E. hour	<u>10.00</u>	22.84		
GROSS COST		115.73	115.73	GROSS COST
Adjustment for residues		(-) 6.92	(-) 6.92	
Credit for brock etc.		(-) 2.16	(-) 2.16	
NET COST		<u>106.65</u>	<u>106.65</u>	NET COST

TABLE III

POTATO COSTINGS - 1961 CROP

SOME OPERATION COSTS

(Money figures are in £'s decimal)

<u>Per Operational Acre</u>					
	<u>Number of Records</u>	<u>Operational Acreage</u>	<u>Man Hours</u>	<u>Tractor Hours</u>	<u>Cost £</u>
Carting and (hand spread	4	26 $\frac{1}{2}$	18.11	6.09	5.60
spreading dung (machine spread	22	226 $\frac{1}{4}$	7.66	6.94	3.28
Discing	12	132	1.09	1.09	0.51
Ploughing	35	395 $\frac{1}{4}$	4.19	4.16	1.94
Cross-ploughing	5	30	1.92	1.92	0.87
Harrowing	27	500	0.48	0.48	0.23
Cultivating	23	411 $\frac{1}{4}$	1.14	1.14	0.51
Sowing fertiliser	26	288 $\frac{1}{4}$	1.11	1.02	0.49
Planting seed: by hand	10	141	21.80	3.40	4.17
by machine	21	184 $\frac{3}{4}$	9.26	3.16	2.61
Combined plant and sow fertiliser	5	77 $\frac{1}{2}$	8.48	3.42	2.79
Harrowing down	29	615	0.68	0.68	0.31
Cultivating	21	434	1.13	1.13	0.51
Grubbing	13	350	0.99	0.99	0.46
Setting up drills	36	770 $\frac{1}{2}$	1.18	1.18	0.54
Burning shaws (contract spraying)	4	72	1.16(est.)	1.16(est.)	3.36
Pulverising shaws: (farm staff)	6	53 $\frac{1}{2}$	0.82	0.82	0.38
(contract)	3	29	1.10(est.)	1.10(est.)	1.36
Lifting (earlies and green ware)	5	48 $\frac{1}{2}$	77.29	4.78	15.58
Lifting and storing	27	274	97.02	13.47*	18.56
Dressing	29	319	34.91	0.70	8.42

* includes 0.09 tractor-equivalent hours i.e. 0.35 horse hours.

STANDARD APPENDIX

In accordance with an agreement among University and College Agricultural Economics Departments, a standard summary of the results is given in the tables in this appendix.

The figures in the tables in this appendix are from 20 maincrop potato costings on 188½ acres and on 8 seed potato costings on 132 acres. Money figures are in £'s decimal.

TABLE I

Summary of Average Costs per Acre

Items of Cost	20 Maincrop		8 Seed	
	Hours	£	Hours	£
Regular labour	66.04	15.08	72.21	16.29
Casual and gang	95.93	15.21	116.95	19.01
Power: tractor	38.67	8.70	31.71	7.14
horse	0.51	0.05	-	-
Contract services		0.32		4.95
Machinery depreciation and repair allowance		0.52		1.00
Other fuel		0.07		0.08
Materials: seed		12.59		20.65
fertilisers and manures applied		21.76		15.95
sundries		2.36		2.83
Rent		1.91		1.81
P.M.B. levy and excess acreage payment		1.58		1.30
Share of general farm expenses		27.69		24.72
Gross cost		107.84		115.73
Adjustment for manurial residues	(-)	10.87	(-)	6.92
Credit value of brock potatoes	(-)	1.80	(-)	2.16
Net Cost		<u>95.17</u>		<u>106.65</u>

TABLE II

Summary of Average Yields and Returns

<u>Average Yield per Acre</u>			<u>Average Returns or Estimated Value</u>			
	<u>20 Maincrop</u>	<u>8 Seed</u>	<u>20 Maincrop</u>		<u>8 Seed</u>	
			<u>Per Acre</u>	<u>Per Ton</u>	<u>Per Acre</u>	<u>Per Ton</u>
	(tons)	(tons)	£	£	£	£
Ware	6.49	3.49	120.80	18.62	62.87	18.01
Seed	0.77	5.48	20.95	27.72	132.09	24.10
Total	7.26	8.97	141.75	19.52	194.96	21.73
			95.17	13.11	106.65	11.89
Net Cost						
Margin			46.58	6.41	88.31	9.84

TABLE III

Summary of Average Labour and Power used per Acre in Growing, Lifting and Dressing

Averages for 20 Maincrop Potato Costings

Hours per Acre

Operation	Farm Staff	Casual	Contract	Horse	Tractor
Pre-harvest	30.99	7.24	0.15	-	25.89
Lifting and storing	14.84	76.77	0.39	0.51	12.08
Dressing	20.21	11.92	-	-	0.70
Total	66.04	95.93	0.54	0.51	38.67

Averages for 8 Seed Potato Costings

Hours per Acre

Operation	Farm Staff	Casual	Contract	Horse	Tractor
Pre-harvest	26.36	12.92	0.02	-	19.86
Lifting and Storing	20.31	88.40	2.68	-	10.92
Dressing	25.54	15.63	-	-	0.93
Total	72.21	116.95	2.70	-	31.71

TABLE IV

Summary of Average Quantities of Materials etc. used per Acre

Material		20 Maincrop		8 Seed		
Seed: purchased home-grown			Overall Average per Acre			Overall Average per Acre
			7.08 cwt. 11.07 cwt.			0.72 cwt. 36.11 cwt
	Area dressed only			Area dressed only		
	Acres	Average per Acre		Acres	Average per Acre	
Farmyard manure	147½	15.75 tons	12.32 tons	81	16.74 tons	10.27 tons
Compounds	188½	11.71 cwt.	11.71 cwt.	132	8.18 cwt.	8.18 cwt.