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Potatoes -  
Cost of  
Production 0.5.

Agricultural Economics Department

University of Manchester

THE POTATO CROP 1952

Costs and Returns on 46 Farms in Lancashire and Cheshire



## Summary

- (1) Data on financial results and yields of the 1952 potato crop were obtained from 46 farms in Cheshire and Lancashire. Average results per acre and per ton were calculated for each district, separately for the Early and Main crops.
- (2) The highest profits per acre were obtained from the relatively high-yielding crops. The average yield of the most profitable crops was about twice that of the least profitable ones.
- (3) A comparison between two groups of farms shows that an average increase of £5.3 in net manure cost per acre was associated with an increase of 1.9 tons in yield per acre.
- (4) The Cheshire "Earlies" produced the poorest financial results of all the groups. Low prices obtained are suggested as the main reason.
- (5) Average times and costs per acre were calculated for the various operations and for the different classes of labour and power used.
- (6) Harvesting by piecework and digging the potatoes by hand appear to have been more expensive than payment on a time basis and mechanical digging.
- (7) There are some indications that planting by hand may be unduly expensive, whereas simultaneous ridging, planting and covering helps to reduce labour costs.
- (8) It is suggested that cutting the seed may be worth while (if it does not cause a reduction in yield), since the reduced quantity of seed required per acre more than counterbalances the extra cost of labour needed for seed cutting.

UNIVERSITY OF MANCHESTER  

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FACULTY OF ECONOMIC AND SOCIAL STUDIES

*With the Compliments*

*of the*

AGRICULTURAL ECONOMICS DEPARTMENT



## THE POTATO CROP 1952

### Costs and Returns on 46 Farms in Lancashire and Cheshire

#### 1. Introduction

An interim report, containing a summary of the costs and returns of the 1952 potato crop, was issued to the co-operating farmers in June, 1953, and each farmer's results were enclosed with his copy of the report.

The present bulletin embodies all the information which was contained in the interim report and, in addition, provides a more detailed analysis of labour costs and of several other aspects of potato production.

It will be obvious to readers, however, that there still remain factors in the economy of potato growing which require analysis. The Department of Agricultural Economics hopes to make some further progress with this analysis by undertaking a fairly large-scale enquiry into the growing of Maincrop potatoes for the 1954 harvest. The success of such an enquiry depends primarily, however, upon the willingness of farmers to co-operate with us and, in expressing the Department's sincere appreciation of the co-operation which makes the present report possible, we look forward to another season of fruitful joint enterprise.

#### 2. The Sample

Particulars of costs, yields and returns of the 1952 potato crop were obtained from 46 farms in Cheshire and Lancashire. Fourteen of the farms were in Cheshire, twelve in North-West Lancashire and twenty in South-West Lancashire.

Early and Maincrop potatoes were costed separately. (On a few farms there was a further sub-division into First and Second "Earlies".) Because of this method of treatment it is necessary to speak of "crops" rather than of "farms" in the present report.

The distribution and acreages of the potato crops investigated are given in Table 1.

Table 1

#### Number of Crops and Acreage Costed

	CHESHIRE		N. W. LANCS.		S. W. LANCS.		ALL DISTRICTS	
	No. of Crops	Acreage Costed	No. of Crops	Acreage Costed	No. of Crops	Acreage Costed	No. of Crops	Acreage Costed
Earlies	15	164.75	9	51.11	11	48.00	35	263.86
Maincrop	9	52.50	12	75.94	20	208.05	41	336.49
Total	24	217.25	21	127.05	31	256.05	76	600.35

#### 3. Costs, Returns and Profits

Table 2 presents the average financial results and yields and the composition of costs for each geographical group, separately for Early and Maincrop potatoes.

Table 2

## Average Costs, Returns, Profits and Yields

FER ACRE	EARLIES						MAINCROP											
	Cheshire			N. W. Lancs.			S. W. Lancs.			Cheshire			N. W. Lancs.			S. W. Lancs.		
	£	s	d	£	s	d	£	s	d.	£	s	d	£	s	d	£	s	d
1. LABOUR	26	14	3	30	4	10	27	2	7	27	6	6	34	3	9	28	2	5
(a) Farmyard Manure	11	0	0	7	8	7	11	13	11	10	13	11	7	18	5	9	6	9
(b) Fertilisers & Lime	9	5	3	7	7	4	12	16	0	11	10	3	7	5	6	12	0	0
(c) Manurial Residues b/f	2	6	3	2	3	4	3	12	6	2	6	4	1	18	11	3	8	9
Total of (a) (b) & (c)	22	11	6	16	19	3	28	2	5	24	10	6	17	2	10	24	15	6
Less Manurial Residues c/f	9	1	6	6	5	3	10	13	1	9	3	3	6	10	5	9	13	10
2. NET MANURES	13	10	0	10	14	0	17	9	4	15	7	3	10	12	5	15	1	8
3. SEED	20	1	0	18	0	0	17	4	10	18	15	7	15	16	5	15	12	7
4. MISCELLANEOUS	-	-	-	-	-	-	-	9	0	-	5	6	-	4	6	-	14	11
5. RENT	2	12	5	2	4	1	2	5	11	2	17	0	2	6	3	2	2	4
Sub-Total (1 - 5)	62	17	8	61	2	11	64	11	8	64	11	10	63	3	4	61	13	11
Estimated Share of Overheads	6	5	9	6	2	4	6	9	2	6	9	3	6	6	4	6	3	4
NET COST (per acre)	69	3	5	67	5	3	71	0	10	71	1	1	69	9	8	67	17	3
RETURN " "	83	0	7	92	8	4	97	15	0	114	6	2	88	15	2	105	17	10
PROFIT " "	13	17	2	25	3	1	26	14	2	43	5	1	19	5	6	38	0	7
YIELD PER ACRE (tons)		6.6			8.0			8.4			10.4			7.7			9.3	
NET COST <u>per ton</u>	11	2	4	8	15	11	9	16	10	7	3	2	9	19	11	7	13	10
RETURN " "	12	10	6	11	9	8	12	7	11	11	3	4	11	12	10	11	7	8
PROFIT " "	1	8	2	2	13	9	2	11	1	4	0	2	1	12	11	3	13	10

Two points may be noted here in connection with Table 2.

(a) Farmyard Manure The cost of farmyard manure per acre would have been higher for both Lancashire groups, had the average been calculated only for those farms on which farmyard manure was applied. In North-West Lancashire, only seven out of the nine co-operating farmers applied farmyard manure to their "Earlies", and ten out of twelve to their "Maincrop". In South-West Lancashire, the proportion was even smaller: seven farmers out of eleven used farmyard manure for "Earlies" and thirteen out of twenty for "Maincrop". All the Cheshire potatoes under survey received farmyard manure.

(b) Miscellaneous The main item under this heading is straw used for covering the clamp.

The average figures given in Table 2 conceal a wide range of individual farm results. Table 3 gives some idea of the differences between the highest and lowest costs, returns, profits and yields. For the purpose of this table the individual results were arranged in order of magnitude, and averages were calculated for, as nearly as possible, a quarter of the results at each end of the scale. This procedure was carried out separately for each heading of the table, and each result applies to a different group of farms, since not all the farms with the highest costs produced the highest yields, etc.

Of the several ways in which the financial results of crop production can be expressed profit per acre is clearly the most important to the individual farmer. Table 4 has been constructed in an attempt to indicate the main factors which appear to have influenced the profit per acre on the farms under investigation. The table presents an analysis of the average costs, returns, profits and yields of the most profitable crops, side by side with results obtained from the least profitable crops.

The table shows clearly that high profits per acre went with high yields and vice versa. For the "Earlies", the difference in returns per acre between the two groups accounts for over 91 per cent. of the difference in profits per acre. The remainder of the difference is mainly due to the low-profit farms having a higher cost of labour per acre.

Whereas the low yield of the least profitable Early crops was obtained at a relatively high cost per acre, the low-profit Main crops were produced at a lower cost per acre than the high-profit ones. This lower cost is largely explained by the fact that some of the farmers used an exceptionally small amount of uncut seed for planting (10 cwt. or less per acre). The saving was not worth while, as it was associated with a financial loss on the crop, but it caused the difference in profits per acre between the two "Maincrop" groups to be less than the difference in returns per acre.

As profit seems to have been connected with yield, it would be useful to know how the high-profit farmers achieved their relatively good yields. The figures suggest a higher level of manuring as one explanation. Although the least profitable crops received, on the average, more farmyard manure than the most profitable ones, they had over 50 per cent. less fertilisers and lime per acre and considerably less manurial residues from previous years than the high-profit crops. In consequence the average net manure cost was higher for the high-profit crops.

Table 3  
Range in Results

		EARLIES			MAINCROP		
		Averages of 9 Results			Averages of 10 Results		
		£	s	d	£	s	d
Cost per Acre:	Highest	83	4	4	86	3	0
	Lowest	55	7	0	54	19	0
Return per Acre:	Highest	125	5	7	144	5	9
	Lowest	72	5	6	67	0	8
Profit per Acre:	Highest	53	5	11	68	3	9
	Lowest	-9	17	0	-0	3	3
		tons			tons		
Yield per Acre:	Highest	10.5			13.0		
	Lowest	4.7			5.7		
		£	s	d	£	s	d
Cost per Ton:	Highest	14	18	11	12	0	4
	Lowest	6	10	1	5	15	8
Return per Ton:	Highest	14	15	2	12	17	10
	Lowest	10	9	6	10	6	2
Profit per Ton:	Highest	5	5	1	5	12	10
	Lowest	-1	5	5	-0	8	10

Note The minus sign (-) denotes a loss.



Table 4  
High-Profit and Low-Profit Crops

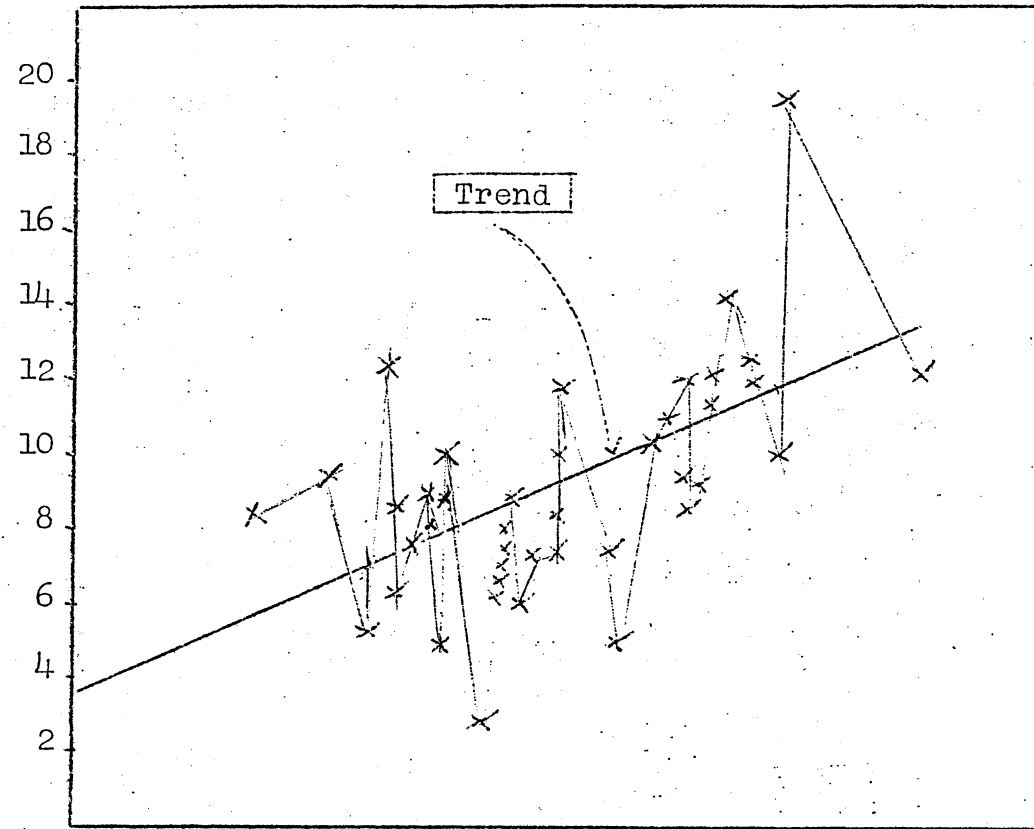
PER ACRE	EARLIES						MAINCROP					
	Average of 9 Crops with the Highest Profits Per Acre			Average of 9 Crops with the Lowest Profits Per Acre			Average of 10 Crops with the Highest Profits Per Acre			Average of 10 Crops with the Lowest Profits Per Acre		
	£	s	d	£	s	d	£	s	d	£	s	d
1. LABOUR	25	10	5	31	9	5	28	9	3	29	19	4
(a) Farmyard Manure	6	13	4	11	19	0	7	10	0	12	11	11
(b) Fertilisers and Lime	11	19	6	7	7	11	13	5	1	8	6	4
(c) Manurial Residues b/f	2	17	6	1	9	6	4	5	9	2	7	9
Total of (a) (b) & (c)	21	10	4	20	16	5	25	0	10	23	6	0
Less Manurial Residues c/f	7	6	9	8	9	7	9	2	11	9	4	10
2. NET MANURES	14	3	7	12	6	10	15	17	11	14	1	2
3. SEED	19	6	9	20	2	11	19	2	4	15	3	5
4. MISCELLANEOUS		8	9	-	-	-		10	7		7	7
5. RENT	2	5	2	2	13	5	2	10	3	2	7	5
Sub-Total (1 - 5)	61	14	8	66	12	7	66	10	4	61	18	11
Estimated Share of Overheads	6	3	6	6	13	3	6	13	0	6	3	11
NET COST (per acre)	67	18	2	73	5	10	73	3	4	68	2	10
RETURN " "	121	4	1	64	4	3	141	7	1	67	19	7
PROFIT " "	53	5	11	-9	1	7	68	3	9	-0	3	3
YIELD PER ACRE (tons)		10.1			5.5			12.5			6.0	
NET COST <u>per ton</u>	6	18	3	13	14	10	5	19	9	11	19	10
RETURN " "	12	2	9	11	14	6	11	8	6	11	11	0
PROFIT " "	5	4	6	-2	0	4	5	8	9	-0	8	10

Note The minus sign (-) denotes a loss.

Net Manure Costs and Yields

(Maincrop)

Yield  
(tons per acre)



Net Manure Cost (£ per acre)

(Each x sign represents one crop of potatoes)

The relationship between manuring and yield was studied for all the Main crops included in the present survey. (It was thought that the yields of Early potatoes might have been influenced to a large extent by the date of harvest). The graph shows what yields were obtained at different levels of manuring. The general tendency for yields to increase as the net manure cost increases can be clearly seen but there is a definite "dip" in the curve, corresponding to the manure costs between £9 and £12 per acre. This is due to the fact that several crops in this range of manure costs were severely affected by blight, flooding and other mishaps which resulted in an exceptionally poor yield.

Table 5 shows the average yields achieved within the several ranges of net manure costs. The results of three crops which were particularly badly affected in the way just mentioned were omitted from the calculations.

Table 5  
Manuring and Yields (Maincrop)

Range of Net Manure Cost, per Acre (£)	Number of Crops	Average Net Manure Cost per Acre (£)	Average Yield per Acre (tons)
4 - 8.9	7	7.7	8.3
9 - 13.9	15	11.3	8.4
14 - 18.9	14	16.6	10.3
19 - 23.9	2	20.8	15.9

The crops in the second cost group did not, on the average, derive any financial benefit from the higher input of manures compared with the lowest cost group. The £9 - £13.9 and £14 - £18.9 groups may, however, be considered the most representative of the four groups, since they include the largest number of crops. Here the average difference of £5.3 in the net manure cost per acre was associated with the average difference of 1.9 tons of potatoes per acre, worth at least £19.

It must be emphasised that on other farms and in other years manure costs similar to those shown in the graph and in the table may be associated with different yield levels. Such divergences may be due to variations in soil type, incidence of blight and other factors, as well as to differences in the kind and price of fertilisers used. Results from individual farms will not, therefore, always be in accordance with the general trend.



It may also be of interest to note the numbers of potato crops which showed a net loss (Table 6).

Table 6  
Numbers of Crops Resulting in a Financial Loss

	Cheshire	N. W. Lancs.	S. W. Lancs.	All Districts
Earlies	5	2	1	8
Maincrop	0	3	2	5
Total	5	5	3	13

It seems particularly striking that one-third of all the Early crops costed in Cheshire resulted in a net financial loss. The Cheshire Early group also shows the lowest average profit per acre and per ton of all the groups included in this investigation (see Table 2). At first sight, the reason for this poor average result and for the high incidence of financial losses may seem to be the relatively low yield per acre. But the Cheshire "Earlies" costed by this Department two years ago had an even lower average yield, and yet their average profit per acre was the highest of all the groups. It seems, therefore, reasonable to suppose that the main reason for the disappointing financial results of the 1952 Early crop in Cheshire lies in the unexpectedly low level of market prices before the seasonal re-introduction of price control.

#### 4. Labour

The average labour costs per acre are analysed in Table 7 to show their distribution amongst the component parts, namely: regular and casual workers, tractors, horses and contract work.

Some farmers employed casual labour for harvesting on a piecework basis. The times taken by this type of labour were not recorded, so that only the cost can be shown in the table.

Similarly for contract work, only the money cost was recorded and the times worked by men and tractors are not known.

In studying Table 7 it should be realised that it represents average results and the distribution of times and costs between the different categories of labour and power cannot be taken as applicable to any one farm. For instance, in the "N. W. Lancs. Earlies" group the figure of £1-2-3d. for Contract Cost of Harvesting and Dressing was obtained in the following manner: Digging and Picking was carried out by contract on one farm only, at the cost of £10 per acre. This

cost was divided by the total number of crops in the group, i.e. by nine, and the result entered in the table. This is rather an extreme case but similar reservations apply to other items and particularly to the data for horse labour since some of the farms did not use any horses.

This "sharing out" among all the farms in the group of those costs which occurred only on some of the farms is not apparent in the "Total Labour Cost" column owing to the grouping of all the operations under five comprehensive headings. The following are the most important of the operations which were carried out only on some of the co-operating farms:

cultivations previous to ploughing (included under "Cultivations");

boxing, chitting and cutting of seed (included under "Ridging and Planting", which also includes ridge covering);

hand weeding and spraying (included under "After cultivations");

clamping and dressing (included under "Harvesting and Dressing").

"Harvesting and Dressing" was by far the most expensive of all the operations. Its cost per acre was highest in North-West Lancashire; this is the main reason for the relatively high total labour cost in that district. Two factors seem likely to have contributed to this high cost.

(a) A considerably higher proportion of harvesting labour was paid by piecework in North-West Lancashire than in the other districts. This is likely to be an expensive method where yields are relatively low, since the rate of payment is fixed according to the length of row (e.g. "11d. per score yards"), and does not seem to vary with the yield. It may, however, be supposed that, for a given length of row, the time taken in picking the potatoes will be less in a low-yielding than in a high-yielding crop, and this difference would be reflected in the cost if the pickers were paid by the hour.

(b) Ten (including five Early and five Main crops) out of the 21 crops costed in North-West Lancashire were dug by hand, whereas the proportion was much lower in the other districts: three (including two early and one maincrop) out of 31 in South-West Lancashire, and one (Early crop) out of 24 in Cheshire.

It is also interesting to note that the Cheshire Maincrop group, where all the potatoes were dug by machine, had a lower harvesting cost per acre than the remaining Maincrop groups, in which there was a certain amount of hand-digging.

## Average Times and Costs of Labour per Acre

## (a) Earlies

OPERATIONS	HOURS (excl. contract & piecework)				COST (excl. contract & piecework)												Total Labour Cost			
	Tractor	Horse	Manual		Tractor			Horse			Manual			Piece- work Cost	Con- tract Cost					
			Regular	Casual	£	s	d	£	s	d	£	s	d		£	s		d		
																			£	s
<b>CHESHIRE</b>																				
Cultivations	7.5	4.8	9.9	-	1	13	2	6	0	1	5	1	-	-	-	-	3	4	3	
Manuring	5.1	4.2	20.5	0.4	1	3	0	5	4	2	12	0	1	0	-	1	3	4	2	7
Ridging & Planting	3.2	2.6	22.5	0.3		13	1	3	3	2	18	5		11	-	-	3	15	8	
After-cultivations	2.8	4.0	9.8	-		12	0	5	0	1	5	2	-	-	-	-	2	2	2	
Harvesting & Dressing	9.4	2.6	49.6	9.4	1	19	9	3	3	7	6	8	1	6	6	2	13	9	7	
TOTAL LABOUR	28.0	18.2	112.3	10.1	6	1	0	1	2	15	7	4	1	8	5	2	13	26	14	3
<b>N. W. LANCS.</b>																				
Cultivations	6.5	7.7	11.4	-	1	7	8	9	8	1	8	7	-	-	-	-	3	5	11	
Manuring	8.0	2.5	14.5	-	1	13	11	3	1	1	16	3	-	-	-	-	3	13	3	
Ridging & Planting	3.1	1.6	15.0	-		13	3	2	1	1	17	8	-	-	-	-	2	13	0	
After-cultivations	5.5	2.5	18.4	-	1	3	5	3	1	2	5	11	-	-	-	-	3	12	5	
Harvesting & Dressing	5.8	2.1	38.8	-	1	4	9	2	8	4	17	11	-	9	12	8	1	17	0	3
TOTAL LABOUR	28.9	16.4	98.1	-	6	3	0	1	0	12	6	4	-	9	12	8	1	30	4	10
<b>S. W. LANCS.</b>																				
Cultivations	7.8	-	7.8	-	1	11	5	-	-		18	5	-	-	-	-	2	9	10	
Manuring	4.1	0.3	8.4	-		17	4		4	1	1	1	-	-	-	7	4	2	6	1
Ridging & Planting	5.3	0.5	26.7	2.4	1	2	6		7	3	9	3	4	3	-	-	4	16	7	
After-cultivations	9.3	0.2	18.1	-	1	19	8		4	2	5	5	-	-	-	-	4	5	5	
Harvesting & Dressing	10.1	-	54.3	15.0	2	2	11	-	-	7	1	2	2	0	9	1	17	13	4	8
TOTAL LABOUR	36.6	1.0	115.3	17.4	7	13	10	1	3	14	15	4	2	5	0	1	17	27	2	7



Table 7 Cont'd.

## (b) Maincrop

OPERATIONS	HOURS (excl. contract & piecework)				COST (excl. contract & piecework)												Piece- work Cost	Con- tract Cost	Total Labour Cost				
	Tractor	Horse	Manual		Tractor	Horse	Manual																
			Regular	Casual			£	s	d	£	s	d	£	s	d	£						s	d
<b>CHESHIRE</b>																							
Cultivations	7.5	2.0	7.5	-	1	12	0	2	6	1	1	2	-	-	-	-	-	2	15	8			
Manuring	5.6	3.9	19.3	-	1	4	5	4	11	2	8	8	-	-	5	8	-	4	3	8			
Ridging & Planting	3.7	1.6	20.3	-		15	10	2	0	2	10	10	-	-	-	-	-	3	8	8			
After-cultivations	3.9	1.2	6.5	-		16	9	1	5		16	2	-	-	7	3	-	2	1	7			
Harvesting & Dressing	8.9	-	70.7	17.7	1	17	11	-		9	12	1	2	4	8	1	2	3	14	16	11		
<b>TOTAL LABOUR</b>	<b>29.6</b>	<b>8.7</b>	<b>124.3</b>	<b>17.7</b>	<b>6</b>	<b>6</b>	<b>11</b>	<b>10</b>	<b>10</b>	<b>16</b>	<b>8</b>	<b>11</b>	<b>2</b>	<b>4</b>	<b>8</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>12</b>	<b>11</b>	<b>27</b>	<b>6</b>	<b>6</b>
<b>N. W. LANCS.</b>																							
Cultivations	6.5	4.9	9.7	-	1	7	7	6	1	1	4	4	-	-	-	-	-	2	18	0			
Manuring	9.3	1.9	17.1	-	1	19	7	2	4	2	2	10	-	-	1	0	-	4	5	9			
Ridging & Planting	3.2	1.2	16.1	-		13	6	1	6	2	0	4	-	-	-	-	-	2	15	4			
After-cultivations	7.0	1.9	24.4	-	1	9	8	2	6	3	0	10	-	-	-	-	-	4	13	0			
Harvesting & Dressing	7.7	1.0	65.1	5.9	1	12	8	1	2	8	13	7	13	11	7	13	8	16	8	19	11	8	
<b>TOTAL LABOUR</b>	<b>33.7</b>	<b>10.9</b>	<b>132.4</b>	<b>5.9</b>	<b>7</b>	<b>3</b>	<b>0</b>	<b>13</b>	<b>7</b>	<b>17</b>	<b>1</b>	<b>11</b>	<b>13</b>	<b>11</b>	<b>7</b>	<b>13</b>	<b>8</b>	<b>17</b>	<b>8</b>	<b>34</b>	<b>3</b>	<b>9</b>	
<b>S.W. LANCS.</b>																							
Cultivations	7.5	-	7.2	-	1	12	1	-			18	11	-	-	-	-	-	2	11	0			
Manuring	4.0	1.4	9.7	0.03		16	11	1	8	1	3	6		1	-	-	1	2	2	3	4		
Ridging & Planting	4.2	1.5	18.8	2.3		18	1	1	10	2	8	2	5	1	-	-	-	3	13	2			
After-cultivations	6.1	0.7	12.9	-	1	5	10		11	1	12	5	-	-	2	6	-	3	1	8			
Harvesting & Dressing	11.5	1.6	64.5	29.9	2	8	9	2	1	8	13	11	4	7	10	19	2	1	6	16	13	3	
<b>TOTAL LABOUR</b>	<b>33.3</b>	<b>5.2</b>	<b>113.1</b>	<b>32.23</b>	<b>7</b>	<b>1</b>	<b>8</b>	<b>6</b>	<b>6</b>	<b>14</b>	<b>16</b>	<b>11</b>	<b>4</b>	<b>13</b>	<b>0</b>	<b>19</b>	<b>2</b>	<b>5</b>	<b>2</b>	<b>28</b>	<b>2</b>	<b>5</b>	

Planting was studied in some detail as it was thought that the rather remarkable variety of methods used might be reflected in the costs. Six different methods could be distinguished, and the numbers of crops planted by each method are shown in Table 8.

Table 8

Number of Crops Planted by Various Methods

PLANTING METHOD	EARLIES			MAINCROP			All Crops
	Che-shire	N.W. Lancs.	S.W. Lancs.	Che-shire	N.W. Lancs.	S.W. Lancs.	
	No.	No.	No.	No.	No.	No.	No.
1. Hand Planting	10	4	2	5	7	1	29
2. Machine Planting (Horse)	-	1	1	-	1	2	5
3. Simultaneous Planting & Covering (Horse)	-	-	-	-	-	1	1
4. Simultaneous Planting & Covering (Tractor)	2	1	7	2	1	14	27
5. Simultaneous Ridging & Planting (Tractor)	2	-	-	-	-	-	2
6. Simultaneous Ridging Planting & Covering (Tractor)	1	3	1	2	3	2	12
ALL METHODS	15	9	11	9	12	20	76

As mentioned already, the cost of cutting seed potatoes is included under the heading "Ridging & Planting" in Table 7. The great majority of our South-West Lancashire co-operators cut their seed, and this is probably the main reason for their "Ridging & Planting" cost being the highest in the present sample.

In Cheshire and North-West Lancashire, where only a small proportion of our co-operators carried out any treatment on the seed, it is likely that the "Ridging & Planting" costs were influenced to a larger extent by the method of planting. Among the Cheshire and North-West Lancashire crops the "Cheshire Earlies" contained the greatest proportion of "hand planting" and had the highest average "Ridging & Planting" cost. At the other extreme, "N. W. Lancs. Earlies" were lowest with regard to both the proportion of crops planted by hand and the average "Ridging and Planting" cost. It appears, therefore, that manual planting was a relatively expensive procedure.

As against this, method No. 6 (i.e. simultaneous ridging, planting and covering) tended to reduce the cost: in North-West Lancashire, where this method was used on a higher proportion of farms, the average "Ridging and Planting" costs per acre were lower than in Cheshire.

To end this section dealing with Labour Costs a mention can be made of manuring. The biggest item under this heading consists of carting and spreading farmyard manure. In the present sample the proportion of potato crops to which farmyard manure was applied was lower in South-West Lancashire than in the other districts (see page 3). This fact largely explains why the manuring labour cost as shown in Table 7 was lowest in South-West Lancashire.

### 5. Seed

The differences in the average cost of seed per acre between the groups (as shown in Table 2) are due mainly to two factors:

- (1) the varying proportion of "once-grown" and new seed used;
- (2) the differences in the quantity of seed planted per acre.

Where cut setts are planted, less seed potatoes are usually required for planting a given area than on those farms where whole setts are used. In our sample of farms the only district in which seed cutting was widely practised was South-West Lancashire, where cut seed was planted for all the Early crops investigated and for 17 out of the 20 Main crops. (In Cheshire seed was cut for three out of the 15 Early crops and for two out of the nine Main crops; in North-West Lancashire for one out of the nine Early crops and for one out of the 12 Main crops.) Table 2 shows that the South-West Lancashire farms had the lowest average cost of seed per acre - largely, no doubt, as a consequence of the saving effected through the cutting of the seed.

It may be wondered to what extent this saving is offset by the cost of labour involved in the cutting of the potato setts. (x) It took, on the average, 14.2 man-hours to cut a ton of seed (calculated from data recorded for 29 crops). However, the sum of the average costs of seed and cutting labour per acre was still appreciably less than the cost of uncut seed per acre. This can be seen in Table 9. (Nine out of the 76 costed crops were not included in this analysis either because the seed cutting labour was not separately recorded or because only a small proportion of setts was cut).

(x) This cost is only important to the farm economy if no regular labour can be spared for the job without prejudice to other work or without working overtime.



Table 9

Influence of Seed Cutting on Costs per Acre

	Seed Cut (Average of 28 Crops)	Seed Uncut (Average of 39 Crops)
Amount of Seed Planted (cwt.)	15.6	19.1
Cutting Labour (man-hours)	9.8	-
Costs: Seed (£.s.d.)	15 16 11	18 2 2
Cutting (£.s.d.)	1 1 9	- - -
Seed & Cutting (£.s.d.)	16 18 8	18 2 2

No detailed comparison between the costs of planting whole and cut seed was made because there were not sufficient numbers of crops of the two kinds planted by any one method. The cut setts seemed to be quite suitable for mechanical planting. On the few farms where cut seed was planted by hand the rate of planting was slower, on the average, than on those farms where whole seed was used; but the average difference in the planting cost was less than the saving effected through using a similar amount of seed.

The economic advantage of using cut seed would be nullified if seed-cutting resulted in an excessive reduction in yield. To be conclusive, however, any comparison of yields obtained from cut and whole seed would have to be made on crops which were treated exactly alike and grown under identical soil and weather conditions. It is still of some interest, nevertheless, to compare the yields obtained on the farms included in the present investigation.

The thirteen Early crops for which the setts were cut produced, on the average, a higher yield than the twenty-two "whole seed" Early crops (8.10 tons per acre as against 7.19 tons per acre). Among the Main crops, the eighteen "cut" crops yielded, on the average, 8.76 tons per acre, and the twenty-three "whole seed" crops - 9.36 tons per acre. Assuming the average return to be £11-10-0 per ton, the return from the "cut" crops would be £6-18-0 per acre less than from the "whole seed" crops. This reduction in returns is considerably larger than the saving on seed. It so happens, however, that one of the crops for which whole setts were planted gave an exceptionally high yield: 19.5 tons per acre, i.e. over five tons per acre more than the next highest-yielding crop. If this exceptional crop is excluded from the calculation, the average yield of the "whole seed" crops comes to 8.90 tons per acre, which is only 0.14 tons above the yield of the "cut" crops. Now the reduction in returns is £1-12-3 per acre, whereas the saving due to cutting the seed was £1-3-6 per acre.

If we could establish that the lower yield was due to planting cut setts, the conclusion would be that the saving was not worth while. But, although the difference in yield was probably not due to any difference in the average level of manuring (the net manure cost of the "cut" crops being less than one per cent lower than that of the "whole seed" crops), the yields may have been influenced by other, unrecorded factors, such as variations in natural fertility of the soil, etc. The conclusion reached must, therefore, be in the conditional form: the cutting of seed is economically justified if it does not result in any reduction in yield. (x)

(x) This conclusion may have to be modified in case of a considerable change in the relative costs of labour, seed and ware in the future.

NOTES ON COSTING METHODS

MAN-HOURS For the purpose of Table 7 the numbers of hours worked by women, youths and schoolchildren were converted into man-hours in rough accordance with the wage rates paid in each case.

Some of the seed cutting work mentioned in section 5 was done by women, but here the averages were calculated from the actual numbers of hours, without any adjustment. It was thought that for this type of job speed did not depend on the worker's sex, and that the actual time taken was of interest.

LABOUR COSTS

(a) Manual Labour The employer's share of National Insurance contribution was added to the wages in calculating the cost of labour. Farmer's labour was charged at standard agricultural wage rates. Board and lodging supplied to casual workers was charged at the rates fixed by the Agricultural Wages Board for reckoning benefits received in lieu of wages.

(b) Tractors The following rates were charged per hour of tractor work:

Medium wheeled tractors	4s.	3d.
Heavy " "	5s.	0d.
Crawler tractors	6s.	0d.

(c) Horse Labour was charged at 1s. 3d. per hour.

FARMYARD MANURE produced on the holding was charged at 15s. per ton. For the purpose of the graph and of Table 5 this standard charge was also applied to purchased farmyard manure; thus manure costs of all the crops were made more comparable.

HOME GROWN STRAW was charged at £4 per ton.

OVERHEADS were estimated as equal to 10 per cent. of the sum of all the other costs.

YIELDS include seed potatoes but not chats.

RETURNS include, in addition to the money received for ware, seed and chats sold, an estimate of the value of all the potatoes retained on the farm. For this purpose, ware potatoes were valued at average market prices, seed according to the fixed price for once-grown seed, and chats at £5 per ton. Return per ton was calculated by dividing the total return thus obtained by the yield of ware and seed. It is not therefore equal to the average price received for ware potatoes sold.

ACREAGE The acreage figures used in this report include headlands and other areas on which potatoes could not be planted (owing to awkward shape etc.) but which would be included in the potato acreage given in the June Agricultural Returns. Costs yields, returns and profits



per acre would have been slightly higher if the exact acreage planted with potatoes had been ascertained in each case.

AVERAGES All the average results quoted in this bulletin are "per crop" averages. For each potato crop included in the investigation results were calculated per acre and per ton; the averages were obtained by adding up these results and dividing the total by the number of crops in the group. This method gives each farm an equal "weight", i.e. the average is not influenced by the acreage of potatoes grown on any farm. The method has, however, its drawbacks, among which is the fact that none of the "per ton" averages in Table 2 can be checked by means of dividing the "per acre" average by the average yield.

