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Cost of production
O.S.

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NEWCASTLE UPON TYNE



COSTS OF GROWING and HARVESTING OATS,

1 9 4 5

Final Report

COSTS OF GROWING OATS 1945

I.

An interim Report on the cost of growing and harvesting Oats on 25 farms in Northumberland and Durham was published by the Branch of Farm Economics in November 1945 (Report G.18). Details of costs up to the harvesting and stacking of the crop were given in that report. Particulars of threshing costs and yields having now been obtained, the complete costs can be presented both on a "per acre" basis and also per cwt. of oats grown.

Opportunity has been taken to add the figures for five more farms in Northumberland.

The present report, therefore, summarises the costs of growing, harvesting and threshing oats on 30 farms.

Most farmers will probably be interested in these results for the light they may throw on the profitability of growing oats, which now have a guaranteed market at a minimum price of 15/4d. per ton (April 1946). If supplies of alternative feeds were freely available, farmers would also be interested in assessing the comparative advantages of marketing their oats directly or through livestock, as most farmers must do with a large part of their oats in these days of self-sufficiency on the farm.

Some discussion of the accountancy of the matter may help towards a clearer understanding of the bearing of the cost figures on these topical questions.

Two main questions of accounting principle are involved. The first is this. The growing of a crop of oats produces four separate products in return for all the expense incurred. They are head corn, tail corn, straw for fodder and straw for litter. Each of these products, jointly produced, has a value according to its usefulness, and presumably, should have some part of the total cost assigned to it. But there is no scientific formula, rule, or other standard which will decide, beyond debate, how much of the total cost should be charged against head corn, tail corn, fodder straw and litter straw respectively. The cost accountant has to choose some method and hope it will seem sufficiently plausible to be generally acceptable.

A common choice is to apportion total costs against the separate products in proportion to their market values or to their presumed values by some alternative method of assessing value. This way of allocating costs, of course, makes the values determine what the costs shall be. Generally farmers have claimed that the costs should determine the values.

The second major question follows upon the first. Assuming that an acceptable method has produced costs for head corn, tail corn, fodder straw and litter straw, at what prices should these products be charged against the stock consuming them? Leaving litter straw out of the argument on the ground that, while it contributes to livestock production by making

stock comfortable its main purpose is to return to the land as dung, there are three possible bases for charging the food products, namely Cost of Production, or Market Price or Feeding Value (i.e. the calculated cost by purchase of equivalent food content in starch and protein). Again, there is no scientific formula, rule, or other standard, which will determine, beyond debate, which of these alternatives is the correct one.

The cost accountant can only choose one or other of the alternatives, knowing that each will give a different figure of profit or loss on the crop taken by itself, or on the livestock by which the corn and straw are consumed, though not on the crop and the livestock when accounted for together.

In many cost investigations concerned with livestock the costs of production of the crops consumed cannot be obtained and the accountant's choice in charging for crops must be between market price and feeding value. Consequently there is always doubt, where these bases are used, as to how much concealed profit or loss there is in the prices at which home-grown foods are, in fact, charged.

This is a very material consideration when cost figures are being used to determine, or to assess the adequacy of market prices for livestock and livestock products.

In addition to the two major questions of accounting principle, there is also the important question of representativeness. At appropriate places in the report attention is drawn to the range between farm and farm, and even between field and field, in the production costs as calculated. The question is, Does the average derived from such a wide range of individual cases come anywhere near what the true average would be if every crop of oats in the two counties had been costed in the same detail as those on the thirty farms?

We don't know what the true average is but we do know, by the rules of statistics, that it cannot be calculated from the average of our sample within anything but a very wide margin of error. If the annual estimates of the yield of oats per acre given in the official statistics, are accepted as accurate measures (Table 3) then it is fairly clear that there must be many farms in the two counties on which the yields of oats are very considerably below the yields obtained on the farms contributing to this inquiry and on which, in consequence, the costs per hundredweight are likely to be considerably higher.

The general bearing of these discussions on accounting and statistical principles is that it would be most unwise to dogmatise about the cost of producing oats. For the industry as a whole, i.e. for all the crops of oats grown in the country, taken together, there is a cost of production which may be called the cost of production. Nobody knows, or ever will know, what this figure is. Otherwise, in this or that area, or on this or that farm, there is a cost of production which is not necessarily the same as in an adjoining area or on the next farm. The figures presented in this report will help to give a clearer notion of the limits within which lie the costs of growing oats in two established oat growing areas by farmers accustomed to growing oats on land and under other conditions well suited to the crop.

Some of the points made above may be illustrated by practical examples. For a number of years the Branch has participated in the national milk costs investigation, the object of which is to obtain data on the cost of milk production. Since the war oats have formed an important part of the ration fed to dairy cows on most farms and in the absence of cost data for the oat crop on farms in the scheme, oats have been charged at feeding value, based on the prices of alternative foods. In 1944-5 this figure was 11/5d. per cwt. and, on this basis, the net cost per gallon of milk was 16.49 pence. Had oats been charged at the cost figure arrived at in the present report, namely 6/11d. per cwt., the net cost of producing milk would have been reduced to 15.87 pence or a decrease of just over 1/2d. per gallon.

A similar calculation may be made in the cost of beef cattle. In an investigation carried out by the Branch in the winter of 1944-5 the total cost of yard feeding cattle in Northumberland was £16.11.0. per head (see Report No. G.19). For reasons discussed in that report oats, which formed the bulk of the concentrate ration, were charged on the basis of market price at 14/6d. per cwt. (including grinding). Had the cost of production, as calculated for the Northumberland farms in the present report, been used (i.e. 6/5d. plus cost of grinding) the total cost of feeding cattle would have been reduced to £14.14.10. per head.

It must not be inferred from the above examples that the alterations indicated would necessarily have increased the accuracy of the results. They illustrate the differences which can follow from the use of different accounting methods and emphasise the need for careful attention to the method used in a particular investigation or presentation of costs if costings results are to be correctly interpreted and applied.

II.

The scope of the data summarised in this report is shown below.

TABLE 1.	Northumb'd	Durham	Total
No. of farms costed	19	11	30
" " fields "	28	18	46
Average size of Fields .	24.6	12.1	19.7
Total Area costed, acres	688.5	218	906.5

A general description of the farms and of the costing technique employed was given in the interim report (G.18). The five additional farms were similar in type to the rest of the Northumberland sample.

In calculating the cost of threshing, hired equipment has been charged at the contract price, usually about £6 per day (including 2 men). Threshing equipment owned by the farmer has been charged on the basis of depreciation (estimated at 2/6 per hour) plus the direct costs incurred.

Table 2 shows the average costs per acre for the 30 farms.

TABLE 2. AVERAGE COST PER ACRE	North'land	Durham	All Farms
	£. s. d.	£. s. d.	£. s. d.
Cultivations	1. 4. 9.	1.10. 9.	1. 6. 3.
Harvesting	1.17.11.	1.16. 4.	1.17. 6.
Threshing	1. 3. 5.	1.10. 2.	1. 5. 0.
Total	4. 6. 1.	4.17. 3.	4. 8. 9.
Seeds	1.16. 0.	2. 7. 8.	1.18.10.
Manures	6. 0.	8. 7.	6. 8.
Rent	1. 1. 9.	1.15. 8.	1. 5. 1.
Twine, etc.....	4. 0.	4. 0.	4. 0.
Net Residual Values	9. 9.	1. 9.10.	15. 1.
Total Cost	8. 3. 7.	11. 3. 0.	8.18. 5.
Range: Highest	13. 8. 4.	16. 0. 6.	16. 0. 6.
Lowest	5.19. 0.	7. 4. 5.	5.19. 0.

Apart from the addition of threshing charges, the costs do not differ materially from the figures previously given for 25 farms. The charge for manures in Northumberland is less than that previously shown but this is more than counterbalanced by an increased debit for residual values.

Threshing cost rather more in Durham than in Northumberland, mainly because only one farm possessed threshing equipment, whereas in Northumberland 12 out of the 19 farms costed had their own threshers. This is an obvious example of the savings which can be effected when the farm is sufficiently large to warrant such special equipment.

Yields were generally satisfactory, and are given in the following table, which also shows the latest published ten year average yield as reported in the official statistics.

TABLE 3. YIELDS OF CORN, excluding tailings	North'land	Durham	All Farms
Average Yield of Corn per acre on costed farms	25.5 cwts.	26.5 cwt.	25.7 cwt.
Range of Yield: Highest	32.8 "	31.7 "	32.8 "
Lowest	15.0 "	15.0 "	15.0 "
Ten Year Average 1929-38 (official statistics)	18.5 "	18.3 "	-

The average cost per cwt. is shown in Table 4.

TABLE 4. AVERAGE COST PER CWT.	North'land	Durham	All Farms
	s. d.	s. d.	s. d.
Cultivations	1. 0.	1. 2.	1. 0.
Harvesting	1. 6.	1. 4.	1. 5.
Threshing	11.	1. 2.	1. 0.
Total	3. 5.	3. 8.	3. 5.
Seeds	1. 5.	1.10.	1. 6.
Manures	3.	4.	3.
Rent	10.	1. 4.	1. 0.
Twine, etc.....	2.	2.	2.
Net Residual Values	4.	1. 0.	7.
Total Cost	6. 5.	8. 4.	6.11.
Range: Highest	15. 6.	11. 2.	15. 6.
Lowest	4. 3.	5. 7.	4. 3.

In the above table the whole cost of the crop is charged against the grain. On many farms oat straw is a valuable product and full use of it is made for stock feeding. Any division of costs between grain and straw would be purely arbitrary and it has been thought best to exclude the value of the straw from the calculation entirely.

An analysis of labour and power costs in relation to yield of grain is given in Table 5.

TABLE 5. LABOUR & POWER PER CWT	North'land		Durham		All farms	
	Hours	s.d.	Hours	s.d.	Hours	s.d.
Tractor Work .....	.28	9.	.25	8	.27	9.
Horse " .....	.14	1.	.32	3	.19	1.
Manual "	1.70	2.4.	1.60	2.3.	1.68	2.3.
Threshing Tackle .....	.04	3.	.04	6.	.04	4.
	-	3.5	-	3.8	-	3.5

The extent of the variation in individual costs around the average may be illustrated by a consideration of the range of cost on different fields. Tables 5 and 6 show the numbers of fields where costs per acre and per cwt. respectively fall within the stated limits.

TABLE 6. DISTRIBUTION OF COST PER ACRE. (by fields)

Cost Range	£5-£7	£7-£9	£9-£11	£11-£13	£13-£15	£15-£17
Northumberland	6	11	9	1	1	-
Durham	-	6	1	6	3	2
All Fields	6	17	10	7	4	2

TABLE 7. DISTRIBUTION OF COST PER CWT. (by fields)

Cost Range	4s-5s	5s-6s	6s-7s	7s-8s	8s-9s	9-10s	10-11s	over 11s
Northumberland	4	5	9	6	2	1	-	1
Durham	-	2	2	1	2	6	4	1
All Fields	4	7	11	7	4	7	4	2

These tables indicate that the simple averages shown in Tables 2 and 4 mask very considerable variations in different fields as well as on different farms. There is however a tendency for a majority of the costs to approximate reasonably closely to the average, and it is this fact which justifies the use of the average to represent the general tendency of the costs. Thus Table 5 shows that 27 out of the 46 fields had costs within about £2 per acre of the average figure. Similarly 29 fields were within about 2/- of the average cost per cwt.

Yield per acre is obviously an important factor in determining costs, and in the following table the costs per acre and per cwt. are grouped according to the yields recorded from each field.

TABLE 3. RELATION BETWEEN YIELDS AND COSTS.

Yield per Acre	Cost per Acre		Cost per Cwt.	
	North'land	Durham	North'land	Durham
	£. s. d.	£. s. d.	s. d.	s. d.
15 cwts. to 19 cwts.	7.18. 5.)	8.13. 7.	9. 2.)	9. 4.
20 cwts. to 24 cwts.	8. 7. 4.)		7. 2.)	
25 cwts. to 29 cwts.	8.10. 6.	11.17. 5.	6. 7.	8.11.
30 cwts. to 34 cwts.	8.12. 0.	11.17. 1.	5. 6.	7. 9.

The cost per acre increases as yields increase, but the extra cost is more than compensated by the additional crop and the cost per cwt. steadily falls.

III.

On three farms in Northumberland the crop was cut with a combine harvester. These farms have been excluded from the foregoing tables, but they do not provide a sufficiently large sample for separate tabulation. The average total cost of the crop (including combining and drying) on these three farms was slightly higher than the cost on farms which harvested in the ordinary way, although the yield of grain was practically identical (25.6 cwt. per acre against 25.5 cwt.) The cost averaged £9. 1. 10. per acre compared with an average cost in Northumberland of £8. 3. 7. Combining and Drying cost £1. 1. 9. and £2. 2. 7. per acre respectively, a total of £3. 4. 4. as against £3. 1. 4. for cutting, stacking and threshing. The cost per cwt. of combining and drying was 2/6d. compared with 2/5d. for the usual method of harvesting.

In the absence of long term records, however, any estimate of the cost of combine work involves numerous assumptions. The incidence of depreciation and, even more important, of obsolescence, is a major factor in the estimation of cost, and it is one which cannot be fixed with any degree of certainty. The amount of work which the machine is able to do in any season is also an important factor and this is controlled not only by the weather but by the acreage of corn crops on the farm and by the scope which exists for undertaking contract work.

In calculating the figures given above, a charge of 32/- per hour has been made for a 12 ft. self-propelled combine and 16/- for the smaller tractor drawn type. These figures are based on the best available estimates. Grain drying has been charged at 30/- per ton, which was the usual contract price in the area.

IV.

The following tables show the costs for your own farm for comparison with the averages given in the report. Where several different fields have been costed they are shown separately.

Cost per Cwt.
(Compare with Table 4 on p. 4)

Cultivations	
Harvesting	
Threshing	
Total	
Seed	
Manures	
Rent	
Twine, etc.	
Net Residues	
Cost per Cwt.	
Yield per Acre	

Cost of Labour & Power per Cwt.
(Compare with Table 5 on p. 5)

Tractor Work			Horse Work			Manual Work		
Hours	s.	d.	Hours	s.	d.	Hours	s.	d.

For particulars of costs per acre on your farm and the average cost per acre for all farms please refer to the Interim Report No. G.15 where these figures are given in detail.

