



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Barley - Cost of production
O.S.

OCTOBER 1962

ECONOMIC REPORT NO. 77

GIANNI FOUNDATION OF
AGRICULTURAL ECONOMICS
LIBRARY

DEC 1962



**BARLEY PRODUCTION IN THE EAST
OF SCOTLAND, 1961**

by

P. C. MARTIN, B.Sc., Dip.Ag.

**THE EDINBURGH SCHOOL OF AGRICULTURE
WEST MAINS ROAD
EDINBURGH 9**

Dept. of economics

THE EDINBURGH SCHOOL OF AGRICULTURE

WEST MAINS ROAD

EDINBURGH, 9.

BARLEY PRODUCTION IN THE EAST
OF SCOTLAND, 1961

by

P. C. MARTIN, B.Sc., Dip.Ag.

October, 1962.

R.62/79

DEPARTMENT OF ECONOMICS

STAFF

J. D. NUTT, B.A., N.D.A.
B. PEART, B.A.
D. M. R. LEASK, B.Sc.
W. B. DUTHIE, B.Sc.
J. A. MACLENNAN, B.Sc.
J. D. ROWBOTTOM, B.Sc.
A. BLYTH, M.A.
Miss I. E. G. MACKINTOSH, M.A.
T. G. MOFFAT, B.Sc.
Miss E. M. WRIGHT, B.Sc., N.D.A.
P. C. MARTIN, B.Sc., Dip. Ag.
F. ROBERTS, B.A., M.Sc., Dip.Ed.

Publications

A. Annual Reports on Financial Results of East of Scotland Farms :-

Hill Sheep Farms	}	Reports for the years 1948-49 to 1960-61
Stock-Rearing Farms		
Stock Raising and	}	Reports for the years 1948-49 to 1960-61
Feeding Farms		
Arable Farms		
Dairy Farms		Reports for the years 1948-49 to 1960-61

B. Enterprise Studies :-

Milk Production (Annual Reports)
Commercial Egg Production
Pig Production
Calf Production
Barley, Turnips and Sugar Beet Costs, Peas for Processing,
Etc.

C. Miscellaneous

Piece-Work Potato Gathering
Hill Farming during the Post-War Period
Some Notes on Re-seeding Old Grassland on Hill and Upland Farms, 1955-57.
Diesel Tractor Costs and Performance in the East of Scotland, 1956-57.
Some Notes on Grain Drying - 1957 Harvest
Report on Grain Drying - 1958 Harvest.
Organisation of Hill and Upland Farming in Selkirkshire
Economic Aspects of Tractor Work, 1957-58
Some Notes on the Depreciation and Repair Costs of Farm Machinery
Hill and Upland Sheep Production Costs.

Copies of these publications may be obtained on request
to the Secretary of the College or the Advisory Economist.

C O N T E N T S

	<u>Page</u>
I. INTRODUCTION	1
II. THE SAMPLE OF FARMS	2
III. COSTS, RETURNS AND MARGINS	3
(A) ANALYSIS OF INPUTS	5
(B) FACTORS INFLUENCING RETURNS AND MARGINS	9
IV. TWO YEARS' RESULTS COMPARED	12
(A) 12 LOW COST AND 12 HIGH COST CROPS	14
(B) 12 LOW MARGIN AND 12 HIGH MARGIN CROPS	16
V. SUMMARY	17
ACKNOWLEDGMENTS	17
APPENDIX I - Costing Method	
APPENDIX II - Barley Marketing in Scotland 1960/61 and 1961/62. Quantities and Prices from the 23 towns prescribed under the Corn Returns Act.	

FOREWORD

The barley crop has become of increasing importance in the arable areas of Scotland in recent years and now occupies as great an acreage as that devoted to the more traditional cereal crop - oats. In many respects this is the result of the revolutionary changes which have taken place in farming practice over the last twenty years or so. The introduction of new varieties suited to the requirements of new harvesting techniques, the disappearance of the horse, the extended use of barley as feed for other categories of livestock and the greater use of fertilisers have all made the increased significance of barley a possibility in physical terms. On the economic side the supplementation of market prices has shielded the farmer from the otherwise inevitable result of rapidly increasing production. This has undoubtedly been a major factor in stimulating and maintaining the expansion of the crop.

This report summarises the costs of growing barley in 1961, and compares these with the costs in 1960. Apart from minor variations in individual items there has been little change over all and a cost of around £23 per acre could be taken as a reasonable average, though costs on individual farms showed wide variations.

The most interesting element associated with the 1961 crop has been the introduction of differentials via the acreage deficiency payment in an attempt to bring about a more orderly flow on to the market and thus avoid the depressing effect of heavy sales at, or shortly after, harvest. As yet it does not appear that this attempt has been successful as, on average, the farms included in the 1961 sample have been penalised for early sales of barley. This does not appear to have been due to the absence of facilities for storing grain on the farm which, with combined grain, could well mean immediate sale or incurring drying charges. Many farmers with adequate facilities sold immediately or soon after combining. This action may have been due to a variety of reasons - the need to re-finance the farm business at that time of the year or the absence of reliable market intelligence on the future prospects are two which come readily to mind. In the circumstances of the 1961-62 season there is little doubt that those who stored their barley got the best of both the market and the acreage payment differentials. Efficient low cost production is still a most important element but the need for orderly marketing has been re-emphasised by the new deficiency arrangements.

The figures regarding production costs and the discussions of the marketing situation should be of interest not only to those farmers who have supplied records of their own crops, but to all those concerned with the growing and disposal of what is now the most important cereal crop in Scotland.

J. D. NUTT

Advisory Economist

I. INTRODUCTION

This report deals with the second year of an investigation into the costs of growing barley in the East of Scotland.

It was pointed out in the previous report* that while the total cereal acreage in Scotland is little above the pre-war level, the acreage sown to barley had increased by two and a half times since 1938. This trend continued in the 1961 crop year at the expense of the oat crop. In the East of Scotland province the barley acreage exceeded that sown to oats for the first time.

For the student of barley production and marketing, the 1961 crop has been an extremely interesting one, although for the farmer with a large proportion of his cash crop acreage devoted to barley it was a worrying time.

At the end of January, 1961, concern was expressed at the amount of Russian barley being dumped in this country at a price of £18 per ton. In February came the news that the acreage of winter wheat sown in England and Wales was about 900,000 acres below that of the previous year because of poor weather conditions. This was somewhat counterbalanced in late April by the announcement that double the usual acreage of spring wheat had been drilled. A fortnight later, however, it was estimated that an extra 340,000 acres of barley had been sown in England and Wales alone; this was confirmed by the June returns.

At the end of May, farmers' fears of a flooded market and low prices for the 1961 crop were somewhat allayed by the publication of details of an incentive scheme designed to encourage the storage of barley.

The home market for what remained of the 1960 crop was in a very depressed state at this time because of dumping from abroad. Prices of such barley were quoted as low as £14:12.6d. per ton for July-August delivery. In mid-June the National Farmers' Union appealed to the government under the anti-dumping legislation. The government satisfied itself that dumping had been occurring and imposed a minimum landed duty-paid price of £20 per ton; imports made at lower prices would be subjected to the appropriate duties.

Following this statement, a minimum guide price of 18s.3d. per cwt. was suggested for home grown feed barley from the 1961 crop. Within a few weeks alarm was expressed that farmers were ignoring the minimum guide price and accepting prices below the Working Party's recommendation of 18s.3d. per cwt.

It was probable that the full significance of the government's anti-dumping action was not realised and the lack of knowledge of how much barley would be available off British farms led to prices being poorly adjusted to the new market conditions.

By early September, forward contract buying on a hitherto unknown scale had caused prices to steady considerably. The prices agreed upon were, very often, the guide price plus the cost of storage until the delivery date. The merchants and compounders were pleased to have the grain stored on the farms until they were ready to use it and the farmers were happy to obtain a price well above the market level at that time.

In November, it was possible to say that quantitatively, the selling pattern had been more satisfactory than in recent years. Even so, the average price for all types of barley from harvest until November was lower than in any other post-war year for the same period. The low prices during this period were /

* Economic Report No. 72

were the resultant of several factors. Despite the reactions to the dumping of barley in this country in the first six months of 1961, more barley was imported in the second half than for the same period in 1960. This, together with increased maize imports and a larger volume of home barley supplies, forced prices down during this period.

The government's grain stocks census showed that at the end of October 1961, farm stocks of barley were about 44% above those of the same month in the previous year; at the end of November, this level had dropped to 19% and by the end of January, 1962, stocks were down to the same level as in January, 1961. From November, 1961, until the end of the marketing period in June, 1962, prices rose fairly steadily. The pattern of sales and prices in Scotland for the two years, 1960/61 and 1961/62, can be seen in the graphs in Appendix II.

Farmers still have every confidence in barley as a cash crop. The acreage sown in 1962 is estimated to have increased by 3.1% in England and Wales and by 10% in Scotland compared with that of 1961. The present pricing arrangements have a considerable stabilising influence irrespective of world market conditions.

II. THE SAMPLE OF FARMS

Forty-five farmers kept records on the 50 crops of barley which provide the basis of this report. On several farms the complete barley acreage was costed and, in all, the acreage amounted to a total of 2,587 acres. An identical sample of 40 farms was available for comparisons between the 1960 and 1961 crop years.

TABLE I. DISTRIBUTION OF THE FARMS BY SIZE

A C R E S						
150-299	300-449	450-599	600-749	750-899	900-1049	1050+
8	15	8	9	2	1	2

It can be seen that the sample is only representative of the larger arable farms. The average farm size was 508 acres, the smallest farm was one of 150 acres and the largest farm extended to 1,863 acres.

As may be expected, the cropping pattern of the sample farms was almost identical with that of the previous year, 44% of the average farm acreage was used for cereal production. This figure was slightly exceeded on the smaller farms (excluding a few dairy farms), while the larger farms used rather less than this percentage of their acreage for growing grain. The pattern was repeated when considering only the barley acreage, but with wider differences between the groups of small and large farms. The farms making up the 150-299 acres group used an average of 34% of their farm acreage for growing barley, this figure was reduced to 28% for the farms making up the 300-449 and 450-599 acres groups, and was down to 24% for the 600-749 acres group of farms. This could largely be accounted for because the smaller farms have very limited grain storage capacity and, this last year excepted, it has not paid to store feeding barley in recent years.

TABLE II. /

TABLE II. AVERAGE FARM CROPPING

Cropping per 100 Acres		
	Average Farm	
	Acres	Acres
Barley	27.3	
Wheat	12.1	
Oats	4.4	
Mixed Corn	0.2	
		44.0
Total Cereals		
Potatoes	8.7	
Sugar Beet	3.1	
		11.8
Total Cash Roots		
Feed Crops	4.4	
Other Crops and Fallow	1.3	
		5.7
Total Other Crops		
TOTAL TILLAGE	61.5	61.5
Temporary Grassland	30.9	
Permanent Pasture	7.6	
		38.5
TOTAL	100.0	100.0

Just over half the crop was grown after a cereal or pea crop, just under one-third of the acreage followed a root crop, and the remainder was sown after ploughed out grassland.

The Weather

The autumn and winter months of 1960 were particularly wet, which cut the winter wheat acreage considerably and left a backlog of work to be done in the spring. The first two months of 1961 brought an improvement and cultivations were well ahead on the lighter soils. March and April, despite some rain, gave good soil conditions and cultivations were unhindered. May and June were cool, and the windy conditions left dry soils. Some rain fell in July and both this and the next month were dull and cool. In both August and September, gale force winds caused considerable grain shedding, although the costed crops, for the most part escaped lightly.

III. COSTS, RETURNS AND MARGINS

The following table shows the average returns, costs and margins.

TABLE III. /

TABLE III. COSTS, RETURNS AND MARGIN PER ACRE AND PER CWT. FOR 50 CROPS IN 1961

Average Yield = 34.1 cwt. per acre

I t e m	Per Acre	Per Cwt.
	£ s. d.	£ s. d.
Average Value of Grain	35: 4: 6	1: -: 8
Storage Incentive Payment	(-) -: 5: 7	(-) -: -: 2
Deficiency Payment	8:10: -	-: 5: -
Total Returns (excluding Straw)	43: 8:11	1: 5: 6
Total Costs - Straw Credit (1/7 of cost)	19:14: 3	-:11: 7
Margin	23:14: 8	-:13:11
Unadjusted Deficiency Payment as % of Returns		19.6%
Unadjusted Deficiency Payment as % of Margin		35.8%

Every crop in the survey was combined and on only one crop were contract services used.

The average total cost per acre of growing the crop was £22:19.11d. but in the above table the straw value has been treated as a credit to facilitate the per cwt. calculations.

The guaranteed standard price for the 1961 barley crop was 27s. 7d. per cwt. and the difference between this guaranteed price and the United Kingdom average market price is the basis of the deficiency payment which is payable on an acreage basis.

The 1961 crop year saw the introduction of a scheme to encourage farmers to spread their sales of barley throughout the marketing year. This was to be achieved by penalising farmers who sold their barley early in the season and offering premiums on barley which was sold later in the year. Growers who kept their barley for farm use or who sold to another farmer for the purchaser's own use were to be unaffected by this scheme. The scheme was operated through the deficiency payments and the adjustments were :-

Barley delivered in:	Adjustment per Cwt.
July to October	(-) 9d.
November or December	Basic Rate
January or February	(+) 1s.
March to June	(+) 1s.6d.

The negative storage incentive payment in Table III shows that most farmers sold in the first third of the marketing period and by so doing incurred a financial penalty. This matter is discussed more fully in the section headed "Factors Influencing Returns and Margins".

A. ANALYSIS OF INPUTS /

(A) ANALYSIS OF INPUTS

Details of the average costs of labour, power and other inputs are given in Table IV.

TABLE IV. THE AVERAGE COST PER ACRE
OF GROWING BARLEY IN 1961: 50 CROPS: 2,587 ACRES

I t e m	£ s. d.	%
<u>LABOUR AND POWER:</u>		
<u>Pre-Harvest</u>		
Labour	1: 2: 3	
Tractor	1: -:11	
Contract	-: 1: 3	9.7
<u>Harvest and Barn Work</u>		
Labour (a) Harvest	1: 1: 9	
(b) Post Harvest	-: 3: 3	
Tractor	-:10: 3	
Contract	-: 1: 9	8.0
<u>Other Fuel</u>		
	-: 3: -	0.7
<u>Machinery, Depreciation and Repairs</u>		
Harvest Equipment	2:16: 9	
Drying and Storage Equipment	1:16: 8	20.3
TOTAL LABOUR AND POWER	£ 8:17:10	38.7%
SEED	2: 6: 2	10.0
MANURES	2:15: 3	12.0
RENT	2: 3: -	9.4
MISCELLANEOUS COSTS	-:18: 5	4.0
TOTAL DIRECT COST	£17: -: 8	74.1%
MANURIAL RESIDUES b/f.	3:12: 7	} net
MANURIAL RESIDUES c/f.	-:18: 7	
OVERHEADS	3: 5: 3	14.2
TOTAL COST	£22:19:11	100.0%

Labour and Power

Labour and power together made up 52.2% of the direct costs and 38.7% of the total costs. Labour alone made up 10.3% of the total costs and, despite a wage increase in January, 1961, was a reduction on the previous year's figure. This was made possible by easier spring conditions and better weather at harvest, which also cut down the amount of drying needed.

TABLE V./

TABLE V. LABOUR AND TRACTOR HOURS AND COSTS PER ACRE

I t e m	LABOUR		TRACTOR	
	Hrs.	£ s. d.	Hrs.	£ s. d.
Ploughing	2.4	-:11: 4	2.4	-:11: 8
Cultivating	0.3	-: 1: 5	0.3	-: 1: 6
Harrowing	0.6	-: 2:10	0.6	-: 2:11
Rolling	0.3	-: 1: 5	0.3	-: 1: 5
Drilling and Applying Fertiliser	0.9	-: 4: 4	0.5	-: 2: 5
Spraying	0.2	-: -:11	0.2	-: 1: -
Sub. Total	4.7	£ 1: 2: 3	4.3	£ 1: -:11
Combining	0.9	-: 4: 2	0.1	-: -: 5
Baling	0.8	-: 3: 8	0.6	-: 2: 8
Carting	3.0	-:13:11	1.5	-: 7: 2
Sub. Total	4.7	1: 1: 9	2.2	-:10: 3
Drying	0.2	-: -:11		
Dressing and Bagging	0.5	-: 2: 4		
TOTAL	10.1	£ 2: 7: 3	6.5	£ 1:11: 2

Tractor work accounted for 6.8% of the total cost. The time taken in pre-harvest operations was less than that needed in the previous year because of better soil conditions.

Almost all of the combines used were self-propelled machines; six trailer machines were used on five crops. Three farmers swathed the crops before combining. Most farmers baled the straw. Three farmers chopped the straw and ploughed it in, three sold it loose on the ground, and one other farmer sold a quarter of it loose and burned the remaining 170 acres.

Contract services were used by two farmers for spraying, two others hired sprayers. Two crops of straw were baled by a contractor and only one farmer employed a contract combine; this was to help out his own machine.

Depreciation and repairs of specialised equipment was again one of the largest single items of cost accounting for 20.3% of the total. The average cereal acreage harvested by each of the 70 combines was 159.2 acres which was equivalent to 16.2 acres per foot of cutter bar; both these figures show quite an improvement on last year's average performance. Two combines each harvested 300 acres, and another ten each dealt with over 200 acres. The lowest acreage cut by any one machine was the 38 acres handled by a six foot cut trailed machine. Balers also were more efficiently used. Forty-seven machines were used on 43 farms covering an average of 239 acres each, of which 34 acres were hay. Thirty-two farms had drying and storage equipment and the average grain acreage on these farms was 226 acres.

Seed

Seed accounted for 10.0% of the total cost. The average seed rate used, 1.55 cwt. per acre, was slightly higher than that of the previous year; 51% of the seed was purchased. Seeding rates varied between 1.20 and 2.00 cwt. per acre; nineteen farmers used a seed rate of 1.5 cwt. per acre.

Fertiliser.... /

Fertiliser Usage and the Place in the Rotation

Fertilisers, including an adjustment for manurial residues, cost £5:9.3d. per acre comprising 23.7% of the total cost. The average cost of the manures actually applied to the crops was £2:15.3d., 12% of the total cost; the net value of the residues made up the remaining cost.

A greater number of farmers used the more concentrated fertilisers than in the previous year and more farmers took advantage of the early delivery and storage rebates offered by the manufacturers. The overall effect is that slightly less money was spent on a smaller quantity of fertilisers but more nutrients were applied to the crops.

Almost all of the manures applied were in the form of compounds. Lime was applied before three crops were sown. Three crops received no fertiliser at all; two of these followed root crops, the third followed ploughed-out grassland. Straight nitrogen was applied to only three crops, as a top dressing in one case. The average amount of fertiliser used was approximately equal to a dressing of 3 cwt. per acre of a compound having the analysis N 12% : P₂O₅ 11½% : K₂O 12½%

TABLE VI. AVERAGE FERTILISER USAGE

I t e m.	Units* of Fertiliser			Approximate Equivalent Dressing of Fertiliser
	N	P ₂ O ₅	K ₂ O	
7 Crops after ley	28.7	29.9	32.0	= 3 cwt. of 9½ 10 10½
17 " " roots	26.9	28.6	29.6	= 3 " " 9 9½ 10
20 " " corn	47.9	41.5	47.7	= 3 " " 16 14 16
6 " " mixed cropping	34.7	30.2	33.3	= 3 " " 11½ 10 11
Overall Average	36.5	34.1	37.6	= 3 cwt. of 12 11½ 12½

* 1 unit of fertiliser = 1/100th of 1 cwt.

Twenty crops, or part-crops, were undersown and the average fertiliser dressing they received, 33.1 units of nitrogen, 35.0 units of phosphate and 37.7 units of potash, shows little variance from the overall average used.

TABLE VII. THE CROPS PRECEDING BARLEY - 1961

Preceding Crop	Acres	%
Barley	781	30.2
Wheat	333½	14.8
Oats	173	6.7
Peas	44	1.7
	1381½	53.4
Turnips	255½	9.9
Potatoes	222½	8.6
Sugar Beet	189½	7.3
Other Root and Green Crops	110½	4.3
	778	30.1
Grass	427½	16.5
TOTAL	2587	100.0

In East Perth 73% of the barley acreage was a second barley crop; in Roxburgh, Angus and the Lothians 52%, 55% and 74% of the barley acreages, respectively, were second white crops.

The barley crops following grassland yielded an average of 38 cwt. per acre, those following roots 35 cwt. per acre and the second white crops yielded 33 cwt.

Rent

The average rent per acre was £2:3s. which was 9.4% of the total cost. Individual rents ranged between 13s.7d. and £4 per acre. Twenty-two farmers rented their land; the other 23 were owner-occupiers.

Miscellaneous Costs

These include such items as spray materials, baler twine and sack hire. The first two items make up most of the average cost of 18s.5d. per acre.

TABLE VIII. THE SPRAYS USED

Type of Spray	Acreage Sprayed	No. of Cases
M.C.P.A.	1766	26
M.C.P.B.	227	4
C.M.P.P. (Mecoprop)	88	3
D.N.O.C.	33	1
2.4.D.	22	1
D.N.B.P. (Dinoseb)	12	1
	2158	

Overheads

This figure is an empirical attempt to allow for those fixed costs which are not already accounted for. The figures used have been slightly increased compared with those used for the 1960 crop costing. The difference amounts to about 4s. per acre.

The following table shows the distribution of the individual costs per acre of the 50 crops under review. These ranged from £14:16.7d. to £34:13.2d. per acre. Twenty-six crops cost less than the overall average of £22:19.11d. per acre while 36 fell within the limits of £17:10s. and £25:10s. per acre.

TABLE IX. DISTRIBUTION OF COSTS

COSTS PER ACRE								
£12½- £15*	£15- £17½	£17½- £20	£20- £22½	£22½- £25	£25 £27½	£27½- £30	£30- £32½	£32½- £35
1	2	11	11	14	5	3	1	2

* £12½-£15 = £14:19.11d.

(B) FACTORS.../

(B) FACTORS INFLUENCING RETURNS AND MARGINS

Returns

In addition to the yield and the quality of the grain as factors influencing the levels of returns, the date of sale made a considerable difference to returns for the 1961 crop. This was because of the government's storage incentive scheme and also the rising market price during the last six months of the selling year. These two factors did, in fact, become of overriding importance; several farmers sold seconds towards the end of the season at prices in excess of those they had received earlier in the year for first quality grain. The average deficiency payment may be ignored for the purpose of discussing the significance of these factors.

TABLE X. BARLEY VARIETIES GROWN, YIELDS PER ACRE, PRICES PER CWT., AND RETURNS PER ACRE

Variety	Total Acreage Costed	No. of Crops or Part Crops	Per Cent	Average	Average	Average Returns
			of Total Acreage	Yield per Acre	Price per Cwt.	per Acre from Grain only
			%	Cwt.	s. d.	£ s. d.
Ymer	1310½	25	50.6	33.1	20: 4	33:12: 4
Beorna	252½	5	9.8	29.2	20: 4	29:12: 5
Drost	227	2	8.8	31.6	20: -	32: 2:10
Freja	202½	7	7.8	36.3	19:10	35:18: 3
Mentor	146½	5	5.7	33.8	20:10	34: 9: 2
Rika	120½	4	4.7	34.2	26: 7	46:10: 5
Maythorpe	100	4	3.9	35.3	19: 3	34: -:11
Carlsberg	57½	1	2.2	34.2	21: 3	36: 5:10
Bonus II	47	2	1.8	30.0	23:10	35: 4: 2
Ingrid	45	2	1.7	38.8	19: 2	37: 1: 9
Vada	27	2	1.0	42.2	22: -	44:12: 2
Proctor	26	1	1.0	26.3	21: 6	28: 4: 1
Hunter	25	2	1.0	41.9	20: 4	42: 7: -
Average				34.1	20: 8	£35: 4: 6

The similar table in last year's report enabled one to pick out those varieties which commanded a premium, this is impossible from the above table.

The four crops of Rika were all sold for seed; the best crop produced 43 cwt. of saleable grain which was sold for 32s.6d. per cwt. The highest yield was 48.8 cwt. per acre from a field of Vada; this same crop shared the doubtful distinction of selling at the lowest price of 16s.6d. per cwt. off the combine. The other crop of Vada gave a much lower yield but was sold for seed.

TABLE XI. DISTRIBUTION OF BARLEY YIELDS

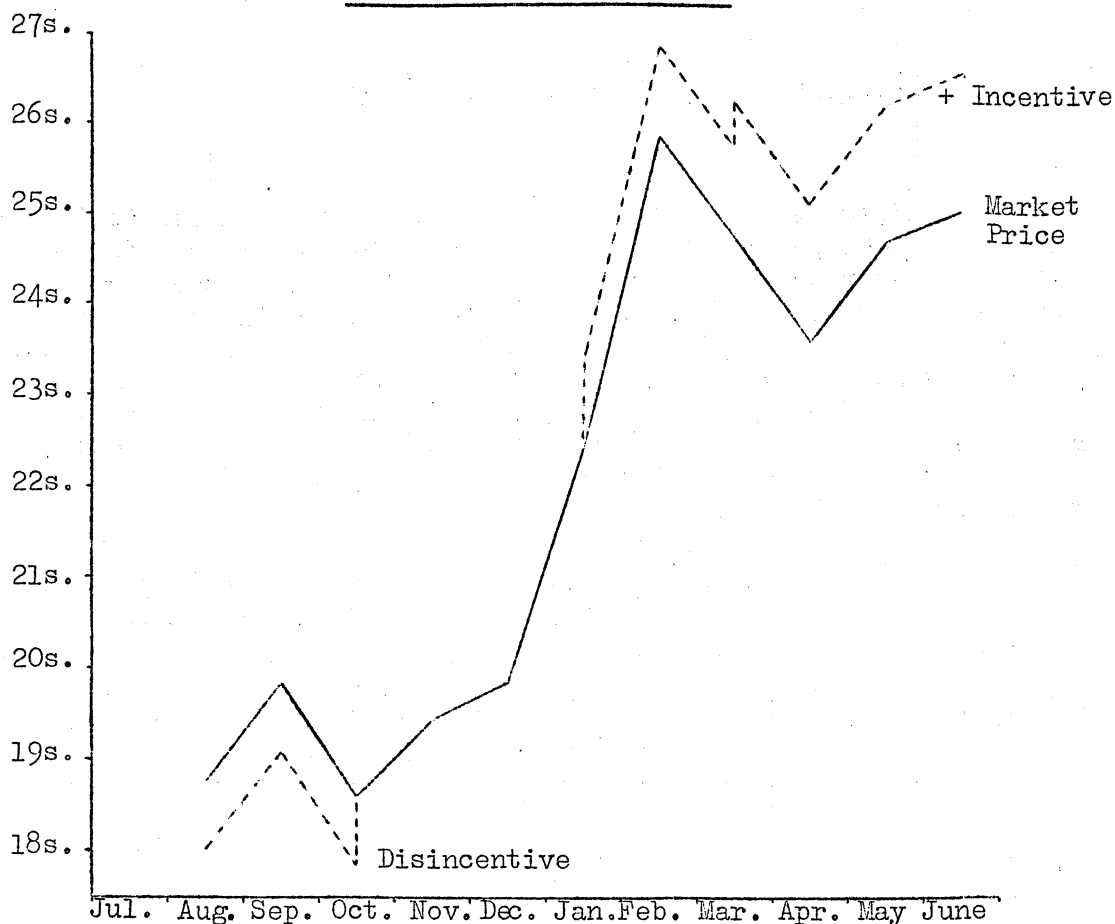
Yields in Cwt. per Acre				
25-30*	30-35	35-40	40-45	45-50
10	20	15	2	3

* 25-30 = 25-29.9

TABLE XII /

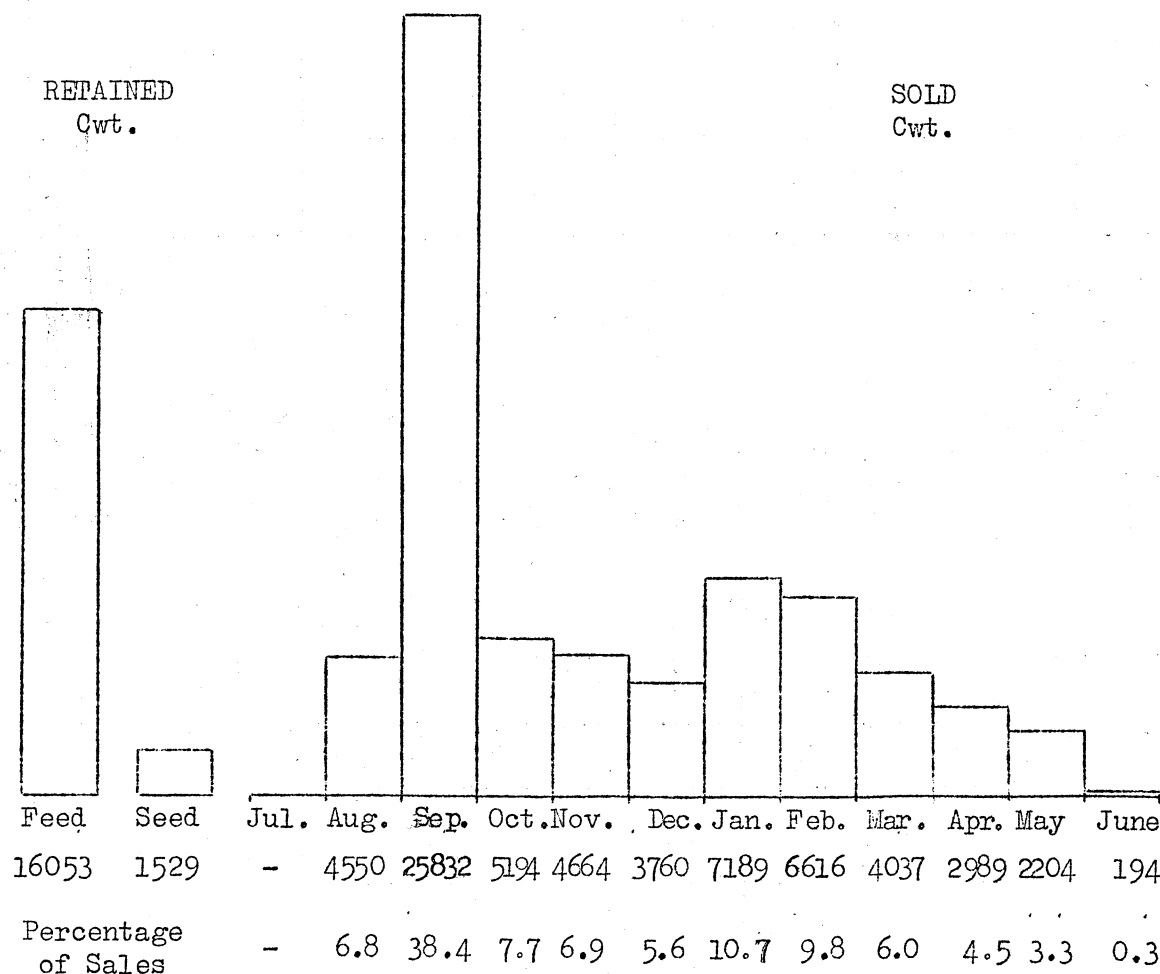
TABLE XII. DISPOSAL OF THE 1961 BARLEY CROP

AVERAGE PRICE RECEIVED



	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
<u>Average Market Price</u>	-	18/9	19/10	18/7	19/5	19/10	22/5	25/10	24/9	23/7	24/8	25/-
<u>+ Incentive</u>	-	9d	9d	9d	-	-	+1/-	+1/-	+1/6	+1/6	+1/6	+1/6

DISPOSAL OF GRAIN



Yields ranged between a minimum of 25.2 cwt. per acre and a maximum of 48.8 cwt. per acre, the overall average being 34.1 cwt. per acre.

An attempt to relate yields to manurial practice for the 1960 crop did no more than cast doubts on the system of calculating manurial residues. For the 1961 crop no correlation was found between yield and the level of manuring or the calculated value of manurial residues brought forward.

Undersown grass seemed to have little effect on yield. Twenty crops or part crops were undersown, covering 955 acres, from which the average yield was 33.5 cwt. per acre.

On average (i.e. the simple average of all the individual farm proportions) 85% of the barley crops was sold. In Table XIII, which shows when the barley was disposed of, only 79.3% of the total quantity produced was sold. This figure is weighted in favour of grain retained for home consumption, in particular by two farmers who, between them costed 550 acres and kept most of the grain produced.

In the month of January, when a 1s. per cwt. premium became payable under the storage incentive scheme, grain sales increased sharply. Most of the grain leaving the farms in February was sold for seed.

Those farmers who sold early in the season, although they had plenty of storage room, suffered from the market uncertainty at the beginning of the sales period. Few crops were sold on forward contract. Only one farmer sold a large quantity of grain this way, contracting to sell over 200 tons between January and June at prices which proved to be well below the market average for this period.

By the end of October 53% of the total quantity of barley sold had left the farms and incurred the penalty of 9d. per cwt. January and February sales accounted for another 20½% of the total grain sold and gained a premium of 1s. per cwt.; the 14% of grain sold in the last four months received a premium of 1s.6d. per cwt.

Straw

Thirty-two estimates of straw yield were obtained, these varied between 12 and 43 cwt. per acre with an average of 25 cwt. per acre. At 1/7th of the total cost, the value placed on the straw per acre was considerably below market value.

TABLE XIII. DISTRIBUTION OF TOTAL RETURNS

TOTAL RETURNS PER ACRE							
£35-£40*	£40-£45	£45-£50	£50-£55	£55-£60	£60-£65	£65-£70	£85-£90
9	18	8	8	4	1	1	1

* £35-£40 = £35-£34:19.11d.

The figures in the above table include the values of the grain, straw and deficiency payment adjusted for the storage incentive scheme. Returns ranged from £35:18s. to £85:0.3d. per acre. The average figure was £46:14.8d. per acre.

Margins /

Margins

The individual margins of returns over growing costs varied very widely, as is shown in Table XIV.

TABLE XIV. DISTRIBUTION OF MARGINS

MARGINS PER ACRE							
£5-£10*	£10-£15	£15-£20	£20-£25	£25-£30	£30-£35	£35-£40	£60-£65
1	3	13	13	12	5	2	1

* £5-£10 = £5-£9:19.11d.

The margins in the table above ranged between £9:15.10d. and £60:14.10d. per acre. Thirty-eight crops produced margins within the range of from £15 to £30 per acre; the average margin was £23:14.8d. per acre.

The fortunes of individual farmers, as represented by the margins obtained, varied greatly from 1960 to 1961. This is, therefore, a convenient point at which to make a comparative study of the results for the two years.

IV. TWO YEARS' RESULTS COMPARED

The costs, returns and margins for the two years are very similar. The small differences between individual cost items have already been discussed, but are briefly repeated for convenience.

Despite the increased wage rates in 1961 both labour and tractor costs were lower than in 1960. This was because of better weather conditions at spring and harvest. Combines and balers were more fully used. Farmers made much more use of the early delivery rebates offered by fertiliser manufacturers.

Wheat and oats are still harvested by binder on a great many farms although the barley crop may have been harvested by combine for some years past. The combine is, however, being increasingly used; some of the reasons are the declining acreage of oats, the falling labour force and the increasing practice of indoor potato storage making bunches of thrashed wheat straw less necessary. These factors would largely contribute to the better use made of combines in 1961. In addition, the 1961 harvest weather was better than that of 1960, which meant that harvest was a relatively straightforward operation and that combines were available for additional work either during or after the harvest on any one farm.

An average of £4,960 per farm was invested by those farmers with drying and storage equipment. The figures referring to capital investment in Table XV show that on the farms concerned the acreage of crops combine harvested was in excess of the cereal acreage grown. On one farm grass seed production was an important enterprise but in most cases farmers were helping out neighbours or relatives if they had the spare capacity; the grain would also be dried if necessary. The figures do not show the amount of contract drying done. On four farms contract drying for merchants was carried out on a large scale and several farmers dried small lots for neighbours.

TABLE XV. /

TABLE XV. TWO YEARS' RESULTS
AN IDENTICAL SAMPLE OF 40 FARMS

PER ACRE	1960	1961
	£ s. d.	£ s. d.
<u>Fixed Costs</u>		
Labour	2:11: 7	2: 6: 4
Tractor Work	1: 2: 8	1: 1: 8
Depreciation and Repairs:		
Harvest Equipment	3: 1: -	2:18:11
Drying and Storage Equipment	1:15: 9	1:19: 3
Rent	1:17:10	2: 1: 5
Overheads	3: 4: 2	3: 3:10
Manurial Residues b/f.	3: 6: 4	3:11: 2
TOTAL FIXED COSTS A.	£16:19: 4	£17: 2: 7
<u>Variable Costs</u>		
Seed	2: 3: 2	2: 5: 1
Manures applied	3: 1: 1	2:15:10
Manurial Residues c/f.	(-) 1: 3: 8	(-) -:18:11
Tractor, Combine and Drying Fuel	-:14: 4	-:11:11
Contract Work	-: 7: -	-: 4: 6
Miscellaneous Costs	1: 1: 1	-:18: 4
TOTAL VARIABLE COSTS B.	£ 6: 3: -	£ 5:16: 9
TOTAL COST A + B	£23: 2: 4	£22:19: 4
Average Returns from Grain at Market Value	36: 2: 1	35:16: 5
Storage Incentive Scheme	-: -: -	(-) -: 4: 5
Average Net Margin	<u>£12:19: 9</u>	<u>£12:12: 8</u>
Average Farm Size	496 acres	496 acres
Average Grain Acreage	215 "	212 "
Average Barley Acreage	134 "	133 "
Costed Acreage	1797 "	2338 "
Average Yield	36.2 cwt.	34.3 cwt.
Total No. of Combines	59	60
Average Acreage cut per Combine	141.4 acres	160.8 acres
Average No. of Acres cut/ft. of Combine Cutter Bar	14.2 acres/ft.	16.4 acres/ft.
Total No. of Balers	40	42
Average Acreage baled per Baler	213	230
Number of Farms with Drying and Storage Equipment	25	26
*Average Capital invested in Drying and Storage Equipment per Acre of Grain grown	£21: 9s.	£22:15s.
*Average Capital invested in Drying and Storage Equipment per acre combined	£20:11s.	£19:16s.
Average Fertiliser Dressing in Units	N. P. K. 31.7 37.9 38.9	N. P. K. 35.0 34.4 38.9

* These figures refer only to those farms with Drying and Storage Equipment.

(A) A COMPARISON OF RESULTS
12 LOW COST AND 12 HIGH COST CROPS
IN 1960 AND 1961

Modern grain production is such a highly mechanised business that the difference between low cost and high cost production is very largely a measure of the efficient use of costly machines and buildings. The following comparison of low cost and high cost crops shows the considerable advantage enjoyed by large farms in their ability to spread the fixed costs tied up in harvesting and storage equipment.

TABLE XVI. 12 LOW COST CROPS AND
12 HIGH COST CROPS IN 1960 AND 1961

PER ACRE	LOW COST CROPS		HIGH COST CROPS	
	1960	1961	1960	1961
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
<u>Fixed Costs</u>				
Labour	1:17:11	1:16: 2	3: 3: 9	2:13: -
Tractor Work	-:16: 8	-:15: 5	1: 3: 9	1: 2: 7
Depreciation & Repairs:				
Harvest Equipment	2:12: 9	2:12:10	3: 6: 4	3: 3: 7
Drying and Storage Equipment	1: 6: 8	1: 6:10	2:11: 1	3: 7:10
Rent	1: 8: 5	1:14: 4	2: 5: 2	2: 5: 2
Overheads	2:10: 1	2:10: 4	3:17:10	3:15: 6
Manurial Residues b/f.	2: -: 6	2:14: 2	4:19:10	4:17: 1
TOTAL FIXED COSTS - A	£12:13: -	£13:10: 1	£21: 7: 9	£21: 4: 9
<u>Variable Costs</u>				
Seed	1: 5: 5	1:16: 4	3: 2: 7	3: 5: 4
Manures applied	2:19: 3	2:13: 5	4: 8: 4	2:18: 4
Manurial Residues c/f.	(-) -:19: 5	(-) -:17: 3	(-) 1:19:11	(-) 1: -: 9
Tractor, Combine and Drying Fuel	-:12: 9	-: 9:11	-:15:10	-:13: 1
Contract Work	-: 3: 7	-: -: -	-:10: 4	-: 2: 7
Miscellaneous Costs	-:16: 9	-:15: 4	1: 1: 2	-:19: 9
TOTAL VARIABLE COSTS - B	£ 4:18: 4	£ 4:17: 9	£ 7:18: 4	£ 6:18: 4
TOTAL COST A + B	£17:11: 4	£18: 7:10	£29: 6: 1	£28: 3: 1
Return from Grain + Storage Incentive	34:13: 5	32:12:10	40:12: -	44: -: -
Margin from Grain	-	(-) -:12:10	-	(+) -:13:11
Yield	17: 2: 1	13:12: 2	11: 5:11	16:10:10
Yield	34.6 cwt.	32.1 cwt.	38.5 cwt.	38.7 cwt.
Average Farm Acreage	584	584	378	378

Most of the farmers whose figures are used in the above table produced very similar cost figures for the two years. Where any doubt existed as to whether figures should be included or not the average of the two years' results was used to make the decision.

It might be suggested that the method of costing places those crops with high manurial residue values and grown with bought in seed, as opposed to home-grown seed, at a disadvantage. If the manurial residues are, therefore,

completely /

completely omitted, and home grown seed is charged at an opportunity cost (what the seed might have been sold for) of £1:5s. per cwt. plus dressing, the considerable gap between the total costs of the two groups is closed somewhat. The total costs of the low cost farms for 1960 and 1961 thus become £17:6.9d. and £16:19.7d. per acre, respectively, and the figures for the high cost farms for 1960 and 1961 become £26:8s. and £24:18.6d.

The considerable differences between the charges for labour and tractor work for the low cost and high cost farms is mostly due to harvest practice, and not field size. Three of the low cost farmers sold straw loose on the ground and one farmer always chopped and ploughed his straw in. The newer, high capacity combines were used by four of these farmers in 1961. On the high cost farms, two farmers swathed the crop before combining and two other farmers used tractor drawn machines. Labour and tractor costs for cultivations were each about 4s.6d. per acre cheaper on the low cost farms, i.e., about one hour's less work per acre. The average field sizes were about 30 and 22 acres respectively, for the low cost and high cost farms. It seems unlikely, under the same working conditions, that a 22 acre field should take much longer to work per acre than a 30 acre field.

The average farm acreages of the two groups were 584 and 378 acres, the low cost farms having the higher average acreage. In both groups just over 40% of the farm acreage was used for cereal production.

It is difficult to evolve a simple means of measuring the possible use of a combine. One method is to divide the cereal acreage on the farm by the width of the cutter bar in feet; this ignores the different thrashing capacities of different machines and also the fact that some farmers are more interested in straw than others. Using this method, the larger, low cost farms, had averages of 15.6 and 16.4 acres per foot of cutter bar in 1960 and 1961, respectively, compared with 14.6 and 12.9 acres on the smaller, high cost farms. These figures would suggest that the low cost farms can make better use of combines on the home farm than the high cost farms can. The figures for the low cost farms increased in 1961 because of a slight increase in cereal acreage and a reduction in combine cut caused by the replacement of obsolete machines by new, high capacity machines.

The acreage to cutter bar ratio for the high cost farms showed a reduction in 1961 compared with 1960 because of a decrease in the grain acreage and an additional combine was bought by one farmer.

The actual utilisation rates for the low cost farms were 16.7 and 18.4 acres per foot of combine cut in 1960 and 1961 respectively. These figures show that quite a lot of work was done away from the home farm. The corresponding figures on the smaller high cost farms were 13.7 and 14.5 acres. In 1960 the binder was used on some farms, but in 1961 the combines covered an acreage in excess of the total grain acreage on this group of farms.

Ten of the low cost farms had drying and storage plants compared with nine of the high cost farms. The average capital outlay per farm on this type of equipment for each of the two groups was almost identical, this sum being spread over a greater acreage in the case of the low cost farms.

As was to be expected, the rental per acre was lower on the larger farms, although it increased between 1960 and 1961.

More home grown seed was used on the low cost farms than on the high cost farms; the farmer also used a higher level of nitrogenous manuring.

There was no consistency from year to year in the yields recorded from the individual farms. The low cost group was weighted by Border farms, five from the Kelso area of Roxburgh and two from Berwickshire. Of the remaining farms, two each were from West Lothian and Perthshire and one from

East/

East Lothian. Most of the high cost farms were north of the Forth. Five were in the "fringe of gold around the beggar's mantle" of Fife, two each were in Angus and Perthshire, and one each were from Midlothian, East Lothian and Berwickshire.

From Table XVI it can be seen that in 1960 the low cost farms had the better financial results even with their lower average yield. In 1961 the results were reversed. The table shows that in that year the majority of the low cost farmers sold soon after harvest; most of the high cost farmers sold later in the season receiving much better prices. Four of the latter group of farmers regularly aim at seed production. In 1960 only two of them received seed prices, while in 1961 all four received good seed prices along with one other farmer.

One farmer in the high cost group achieved outstanding results in 1961. If his figures are removed from this group, the average margin of the other 11 farmers falls to just over £13 per acre, which is below the margin achieved by the low cost farms.

(B) A COMPARISON OF RESULTS
12 LOW MARGIN AND 12 HIGH MARGIN CROPS IN
1960 AND 1961

Results in 1961 were so much influenced by the date of sale that a table of detailed production data for the two groups is of little comparative value. A yield of 35 cwt. per acre sold in January, 1962, realised nearly £10 per acre more than the same quantity sold immediately after the 1961 harvest. The financial advantage from selling late in the marketing year frequently masked relatively high production costs.

TABLE XVII. 12 LOW MARGIN CROPS AND
12 HIGH MARGIN CROPS IN 1960 AND 1961

PER ACRE	LOW MARGIN CROPS		HIGH MARGIN CROPS	
	1960	1961	1960	1961
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Fixed Costs	21: -:10	18:11: 3	13:13: 9	16:16: 1
Variable Costs	7: 6: 9	5:10:10	5:16:10	6:11: 8
Total Cost	£28: 7: 7	£24: 2: 1	£19:10: 7	£23: 7: 9
Returns from Grain	£33: 8: 3	£30: 4: 7	£40: 5:10	£44:12: 2
± Storage Incentive	-	(-) -:15: 2	-	(+) -:13: 4
Margin from Grain	£ 5: -: 8	£ 5: 7: 4	£20:15: 3	£21:17: 9
Yield of Grain	34.1 cwt.	31.6 cwt.	38.7 cwt.	37.6 cwt.

For the 1960 crop year cost was the major factor influencing the margin. In the group of high margin crops for that year, six of the farms concerned also appear in the low cost division in Table XVI, and five of the remaining crops were produced at relatively low cost. Correspondingly, seven of the low margin crops for 1960 in the above table also appeared in Table XVI as high cost crops.

For the 1961 crop year, although low costs were still important, the date of sale made a tremendous difference to returns, and thus to the margin. In the above table, of course, there is quite a difference in average yield recorded for the two groups but, after allowing for the effects of the incentive scheme, there is a difference of 5s. 5d. per cwt. in price in favour of the high margin farms.

Of/

Of the grain sold from the low margin farms in 1961, 80% was sold in the period up to, and including, October, when selling prices were around 19s. per cwt. and the penalty of 9d. per cwt. was incurred. On the high margin farms 60% of the grain to be sold did not leave the farms until the new year, when considerably higher prices were being obtained and the storage incentives of 1s. or 1s.6d. per cwt. were receivable, depending on the time of sale.

The group of high margin farms in 1961 was mostly made up of the best of the low cost and, surprisingly, the best of the high cost farms shown in Table XVI. Four farms were in the low cost group (three of which sold their grain in September) and seven farms in the high cost group. The latter produced good yields, sold their grain in the new year and received very good prices. Included in the high margin group is a farm which, because of very poor conditions in the area, recorded the lowest yield in the survey, 25.2 cwt. per acre. The same farm, however, was responsible for the lowest cost in each of the two years, and this performance in 1961 brought it into the high margin group.

The low margin group contained several farms producing grain at under £20 per acre; unfortunately they combined below average yields (for the farms concerned) with early selling dates. In fact, four of these farms had been in the high margin group the previous year.

V. SUMMARY

1. In 1961, for the first time, the barley acreage in the East of Scotland exceeded that of the oat crop.
2. The sample was made up of 50 crops on 45 farms, the total acreage costed was 2,587 acres. All of the crops were combined.
3. Total returns, grain plus straw and the deficiency payment, adjusted for the storage incentive payment, averaged £46:14.8d. per acre. The average total cost per acre was £22:19.11d. leaving an average margin of £23:14.9d. per acre. The average yield was 34.1 cwt. of grain.
4. The largest single cost items were the depreciation and repair charges for specialised equipment, making up 20.3% of the total cost, and the manurial charge, net of residues brought and carried forward, which was 23.7% of the total cost.
5. Ymer was the most widely grown variety, being grown on 51% of the costed acreage.
6. Along with growing costs and the yield, the date of sale had a great influence on the size of margin.
7. The results of an identical sample of 40 farms in 1960 and 1961 were very similar for the two years.
8. For the 1960 crop year the largest margins were clearly associated with low cost crops, whereas in the 1961 crop year, the largest margins were obtained by farmers who produced high yields, often at high cost, and sold late in the marketing season.

ACKNOWLEDGMENTS

Grateful acknowledgment must be made of the help and hospitality of all those farmers who provided the information on which this report is based. Each of the co-operating farmers will receive a copy of this report.

(i)

APPENDIX I

COSTING METHOD

Manual Labour

All labour, including that of the farmer, was charged at the hourly rates ruling on the farm.

Tractor Work

Wheeled Tractors	-	4s.6d. per hour
Tracklaying Tractors	-	12s.-d. " "

Other Fuel

This includes fuel used by combines, balers and for drying.

Machinery Depreciation and Repairs

A charge of 20% was made on the initial cost of specialised machinery such as combines, balers, drying and storage machinery. For structures such as storage bins, pits and buildings housing drying and storage plant the charge was 8%.

Seed

Purchased	-	at cost
Home Grown	-	12s. per cwt. excluding cost of dressing.

Manures and Manurial Residues

- (a) Dung was charged at 17s. per ton plus the cost of application.
- (b) Artificial manures were charged at cost.
- (c) Manurial residues brought forward and carried forward were calculated in accordance with the recommendations in "Residual Values of Fertilisers and Feeding stuffs", the thirteenth report of the Scottish Standing Committee.

Rent

Rent was charged at the average rental for arable land on the farm.

Miscellaneous Costs

These included such items as spray costs, twine and sack hire.

Overheads

Overheads were charged at the rates agreed by the Scottish Conference of Agricultural Economists. These were as follows :-

	Per £1 <u>Labour</u>	Per Tractor <u>Hour</u>	Per <u>Acre</u>
Dairy Farms	6s. -d.	7s. 6d.	15s. 3d.
Other Farms	6s. 9d.	5s. 3d.	14s. -d.

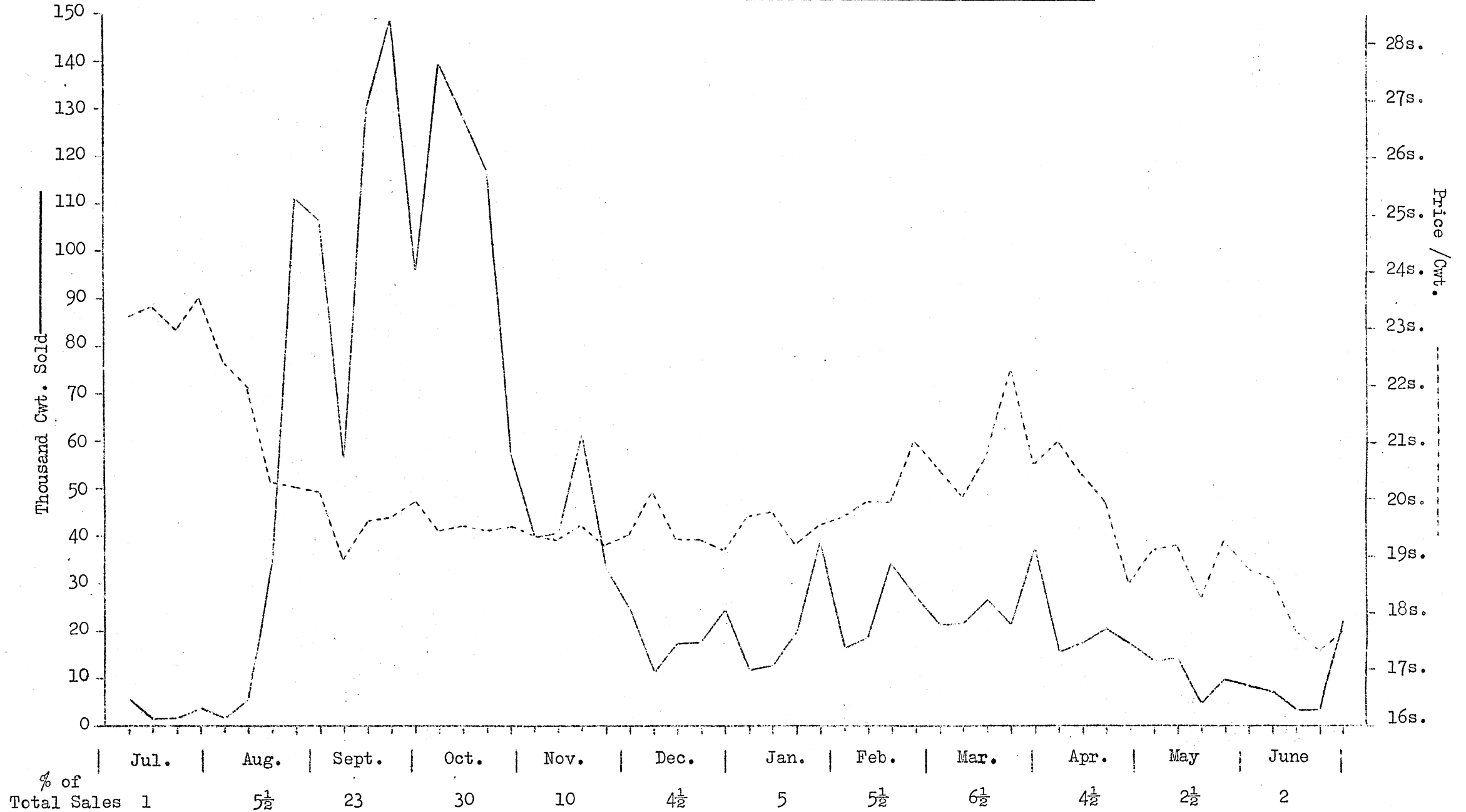
No charges have been made for interest on tenant's capital or for the farmer's managerial work.

Averages

Throughout this report simple averages have been used.

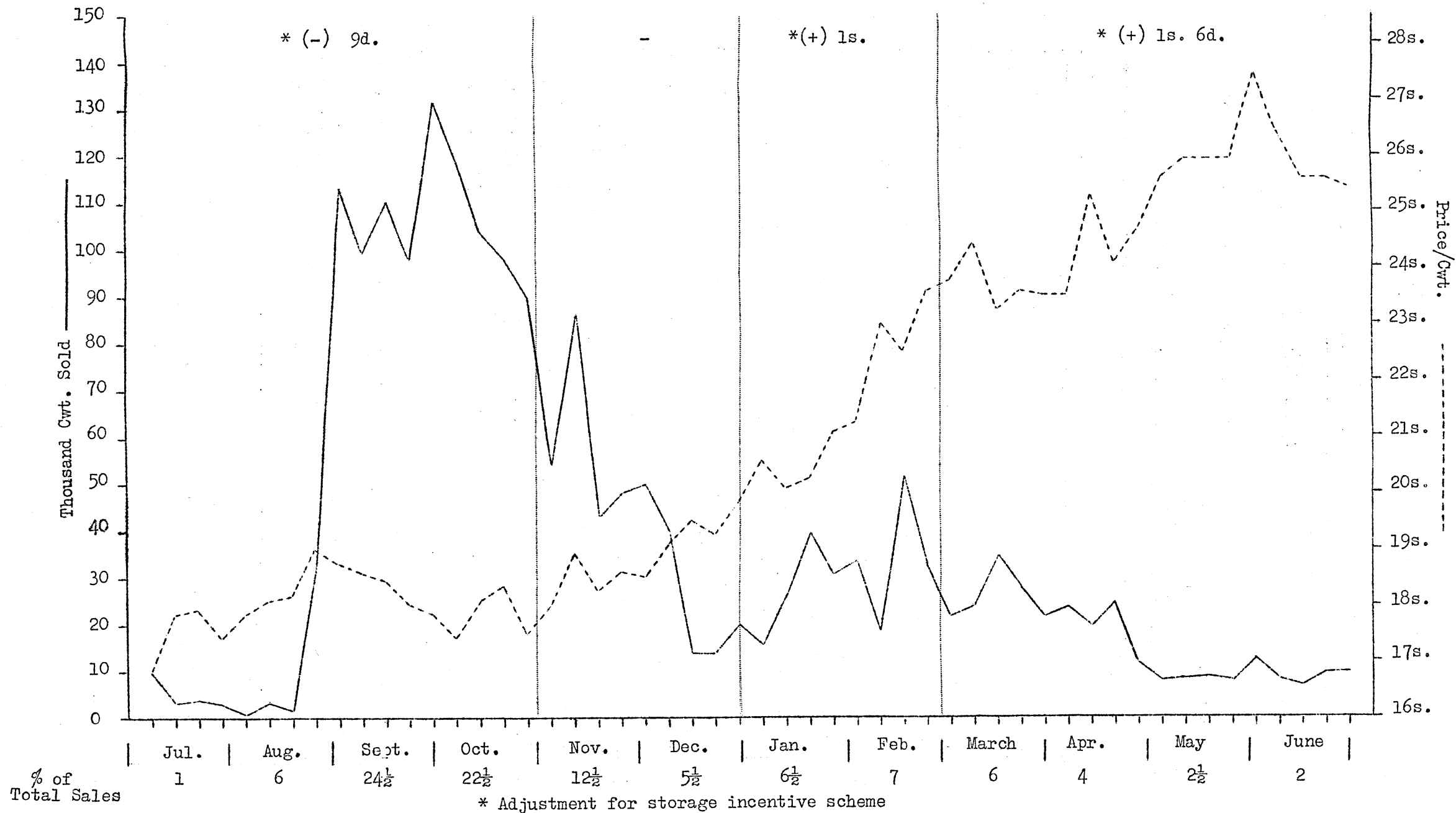
BARLEY MARKETING IN SCOTLAND 1960/61

Quantities and Prices from the 23 towns prescribed under the Corn Returns Act.



BARLEY MARKETING IN SCOTLAND 1961/62

Quantities and Prices from the 23 towns prescribed under the Corn Returns Act.



(iv)

APPENDIX IIISTANDARD APPENDIX

The figures in this Appendix are based on 50 records on 2,587 acres on 45 farms.

TABLE I. SUMMARY OF AVERAGE COSTS PER ACRE

ITEM OF COST				£	s.	d.
	Hours					
	Men	Youths	Females			
Regular Labour	9.8	0.1	0.2			2: 7: 3
Casual and Gang Labour		-				
Power : Tractor		6.5				1:11: 2
Horse		-				
Machinery Depreciation and Repair Allowance						6: 8: 7
Contract Services						-: 3: -
Other Fuel						-: 3: -
Materials: Seed						2: 6: 2
Fertilisers and Manures applied						2:15: 3
Sundries						-:18: 5
Rent						2: 3: -
TOTAL DIRECT COSTS						£18:15:10
Share of General Farm Expenses						1:10: 1
Adjustment for Residual Manurial Values						2:14: -
GROSS COST						£22:19:11
Credit Value of Straw						3: 5: 8
NET COST						£19:14: 3

TABLE II. /

TABLE II. SUMMARY OF AVERAGE YIELDS AND RECEIPTS

	Quantity per Acre	Receipts per Cwt.
	cwt.	£ s. d.
Barley used on farm	4.4	-: 18: 6
Barley Sold	29.7	1: 1: -
Average Adjusted Deficiency Payment	£8: 4: 5d. per acre	

TABLE III. SUMMARY OF AVERAGE QUANTITIES OF MATERIALS PER ACRE

Material	Overall Average per Acre	
Seed: Purchased	cwt. 0.79	
Home Grown	0.76	
	<u>1.55</u>	
	Area Dressed Only	
	Acres	Cwt. per Acre
Fertilisers and Manures:		
F.Y.M.	-	-
Lime	70.5	34.1
Artificial: Straights -		
Nitrogenous	95.0	1.5
Potassic	-	-
Phosphatic	-	-
Compounds	2505.5	3.1
		3.0

