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THE WEST OF SCOTLAND AGRICULTURAL COLLEGE



BARLEY GROWING IN THE WEST OF SCOTLAND 1969 CROP

by

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CONTENTS

	<u>Page</u>
<u>SUMMARY</u>	1 .
<u>INTRODUCTION</u>	2
<u>SECTION 1 THE SAMPLE</u>	
Acreages	3
Yield	3
Varieties	4
Seed and Fertiliser	4
Place in Rotation	5
Continuous Barley Growing	5
<u>SECTION 2 COSTS AND PROFITABILITY</u>	
Variable Costs	7
Output and Gross Margin	8
Yield and Gross Margin	9
<u>SECTION 3 DEFINITIONS AND METHOD</u>	9
<u>SECTION 4 APPENDIX TABLES</u>	
Table I Distribution of Variable Costs	10
Table II Distribution of Total Output	10
Table III Distribution of Gross Margin	10
Table IV Summary of Average Yields and Returns	11
Table V Summary of Average Quantities of Materials etc.	11

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SUMMARY

Barley 1969 Crop

1. This report is based on 32 farm records of barley crops totalling 3079 $\frac{1}{4}$ acres.
2. The results are in two main groups:-
 - 4 farms - seed barley important - 681 acres recorded.
 - 28 farms - mainly feed, a little malting - 2398 $\frac{1}{4}$ acres recorded.
3. Average results per acre taken to the gross margin stage are summarised below.

	4 Seed	28 Feed
	£	
Crop Output	52.85	43.31
Variable Costs	9.80	11.00
Gross Margin	43.05	32.31

Crop output includes the value of all grain sold, fed or kept for seed, also the value of all straw sold or used (but not burned or ploughed in) plus appropriate acreage deficiency payments and, where applicable, storage premiums and Home-Grown Cereals Authority forward contract payments.

4. Average grain yield per acre (adjusted to 16% moisture content) was 33.7 cwt. for the four seed barley crops and 31.8 cwt. for the 28 feeding barley crops.
5. As in the previous year, Ymer and Golden Promise were the most commonly occurring varieties.
6. Average seed rate per acre was 1.49 cwt. for the four seed growing farms and 1.59 cwt. for the 28 others.
7. Fertiliser application per acre (including any top dressing) averaged 2.74 cwt. for the four seed growing farms and 3.02 cwt. for the 28 others, giving an average application of plant nutrients as follows:-

Number of Farms	Units per Acre		
	Nitrogen	Phosphate	Potash
4 Seed	55	32	27
28 Feed	56	33	35

8. The importance of a high yield per acre in achieving high gross margins per acre is again confirmed.
9. Continuous barley growing year after year on a high proportion of the same farm fields is not common practice in the West College province.

INTRODUCTION

This study, which forms part of a larger one being carried out by the Economics Departments of the three Scottish Agricultural Colleges, examines for a second year some aspects of barley growing in the west of Scotland. As it was felt unnecessary to ask farmers to keep field records of labour and tractor hours for two consecutive years, the financial results for the 1969 crop have been taken to the gross margin stage only i.e. variable costs only have been charged.

This report, which follows the pattern of the previous year's report, is based on the records of 32 barley crops covering 3079 $\frac{1}{2}$ acres grown in 1969 in the following counties of the West College province.

County	Number
Argyll	1
Ayr	6
Clackmannan	3
Dumfries	7
Kirkcudbright	3
Lanark	1
West Perth	5
Renfrew	3
Wigtown	3
Total	32

On four of the farms the growing of seed barley was important. On the remaining 28 farms the crop was mainly feeding barley, grown either for use on the farm or for sale, with on some farms a certain amount of barley sold for malting.

After some bitterly cold weather in the spring, the summer in 1969 was generally warm and sunny and in many areas harvesting conditions were very good. The grain in the sample required rather less drying than in 1968. Average yields per acre (adjusted to 16% moisture content) were 33.7 cwt. for the four seed barley crops and 31.8 cwt. for the 28 feeding barley crops.

SECTION 1

THE SAMPLE

Acreage

The distribution by recorded acreage of the 32 crops is shown in the table below.

TABLE I

Distribution by Recorded Acreage

Acres	4 Seed	28 Feed	Total
	Number of Records		
Under 50	1	10	11
50 to 99	-	9	9
100 to 199	-	6	6
200 to 299	3	2	5
300 and over	-	1	1
Total	4	28	32

Altogether $3079\frac{1}{4}$ acres of barley were costed - 681 acres in the seed barley group and $2398\frac{1}{4}$ acres in the feeding barley group.

Yield

The 1969 Scottish cereal yields were on average higher than those of 1968 and also above the average of the previous five years. The figures for barley are shown below:-

Estimated Scottish Average Yield of Barley per Acre

1964-68	30.2 cwt.
1969	30.8 cwt. (provisional)

For the farms in the sample the average yield per acre (adjusted 16% moisture content) was 33.7 cwt. for the four seed barley crops and 31.8 cwt. for the 28 feeding barley crops. These averages were very close to those of the 1968 crop which were 34.9 cwt. per acre for the seed and 31.8 cwt. per acre for the feeding barley crops.

The range in yield per acre (adjusted to 16% moisture content) was from 32.4 cwt. to 35.6 cwt. for the four seed barley crops and from 15.8 cwt. to 41.3 cwt. for the 28 feeding barley crops. The very poor yield in the second group was on a smallish acreage and was not typical as due to breakdowns of the combine almost half of the crop was lost.

On some of the farms in the sample yields of straw were considerably higher in 1969 than they were in 1968.

Varieties

Some farms grew only one variety of barley. Others had as many as five. The table below shows the distribution.

No. of Varieties	No. of Farms
1	9
2	13
3	5
4	3
5	<u>2</u>
	<u>32</u>

The most commonly occurring varieties continued to be Ymer and Golden Promise, the former being found on 19 of the farms and the latter on 13 of the farms.

The acreages of the different varieties found in the sample were as follows:-

Variety	Acres
Ymer	1183 $\frac{1}{4}$
Golden Promise	796 $\frac{3}{4}$
Zephyr	503 $\frac{1}{2}$
Sultan	305 $\frac{1}{4}$
Julia	63
Deba Abed	59 $\frac{1}{2}$
Impala	39
Ingrid	37
Rika	24 $\frac{1}{2}$
Senta	23
Freja	18 $\frac{1}{2}$
Mari	16
Tern	6
Freegold (GPF/65)	4
	<u>3079$\frac{1}{4}$</u>

Seed and Fertiliser

The average seeding rate for the four seed barley crops was 1.49 cwt. per acre (range 1.26 cwt. to 1.71 cwt.). For the 28 feeding crops the average was 1.59 cwt. per acre (range 1.15 cwt. to 2.00 cwt.).

The average rate of applying fertiliser including any top dressing but excluding any lime and slag was 2.74 cwt. per acre (range 1.53 cwt. to 3.40 cwt.) for the four seed barley crops, and 3.02 cwt. per acre (range 0.91 cwt. to 4.53 cwt.) for the 28 feeding barley crops.

This gave an average application of plant nutrients per acre as shown below:-

TABLE II

Average Rate of Applying Fertiliser Nutrients

Number of Farms	Units per acre		
	Nitrogen	Phosphate	Potash
4 Seed	55	32	27
28 Feed	56	33	35

Of the total acreage of $3079\frac{1}{4}$ acres, 958 were undersown, $564\frac{1}{2}$ were top dressed with nitrogen, $612\frac{1}{4}$ were limed, 34 were slagged, 348 were dunged and slurry was applied to 27 acres.

Place in Rotation

The table below shows that almost two-thirds of the 1969 barley acreage had been in barley in the previous year and that almost one-fifth was in grass.

TABLE III

1969 Barley Crop and Previous Year's Cropping

Previous Crop	4 Seed	28 Feed	32 Total	% of Total
	Acres			
Barley	520	1450	1970	64
Other Cereals	-	238	238	8
Grass	91	$483\frac{3}{4}$	$574\frac{3}{4}$	19
Potatoes, Roots, etc.	70	$226\frac{1}{2}$	$296\frac{1}{2}$	9
Acreage Recorded	681	$2398\frac{1}{4}$	$3079\frac{1}{4}$	100

Continuous Barley Growing

Farm records were kept noting how much of the 1969 barley acreage on each farm was in barley in 1968, and similarly how much of that without a break was in barley in 1967 and so on back to 1965. The results for the sample of 32 farms were as follows:-

Year	Acres
1969	$3079\frac{1}{4}$
1968	1970
1967	$1246\frac{3}{4}$
1966	$652\frac{1}{2}$
1965	$377\frac{3}{4}$

The figures for each successive year from 1965 to 1969 in the above table are cumulative and include those of the previous year.

In Table IV the information is expressed in a different form to illustrate the extent to which barley had been grown continuously on the same 1969 barley land by showing the acreages continuously in barley for five years, four years, etc., and expressing these as a percentage of the 1969 total of 3079 $\frac{1}{4}$ acres grown on the 32 farms.

TABLE IV
Continuous Barley Cropping

Number of years continuously in barley	Year of first sowing	Acreage	% of 1969 Acreage
1st year	1969	1109 $\frac{1}{4}$	36
2 years	1968	723 $\frac{1}{4}$	24
3 years	1967	594 $\frac{1}{4}$	19
4 years	1966	274 $\frac{3}{4}$	9
5 years	1965	377 $\frac{3}{4}$	12
Total 1969 Barley Acreage		3079 $\frac{1}{4}$	100

Table V shows the distribution of farms according to the percentage of their 1969 barley land continuously in barley for four years or more.

TABLE V
Distribution of 32 farms according to percentage of barley land continuously in barley for four years or more

% of 1969 barley land continuously in barley	Number of farms recording barley grown continuously on at least some part of their 1969 barley land	
	1966	1965
Over 80	1	1
61 to 80	1	-
41 to 60	2	1
21 to 40	8	4
1 to 20	2	3
None	18	23
	32	32

It will be seen from the above table that continuous barley growing year after year on the same farm fields is not common practice in the West College province.

SECTION 2

COSTS AND PROFITABILITY

Variable Costs

For the 1969 crop, financial results have been taken to the gross margin stage, i.e. variable costs only have been charged. These are the costs directly incurred due to the growing of the barley crop; e.g. seed, fertiliser, sprays, miscellaneous (fuel for self-propelled combines, fuel for drier, electricity for blowers etc., baler twine, sacks etc.), also the cost of casual workers and contract work (including hire of machines). In this report the costs of any slag and lime (including contract lime spreading) have been included among the variable costs.

The table below shows the average costs per acre for the four seed and the 28 feeding barley crops.

TABLE VI

Average Variable Costs per Acre

	4 Seed		28 Feed	
	cwt.	£	cwt.	£
<u>Variable Costs</u>				
Seed Purchased	1.03	2.75	1.21	2.70
Home-Grown	0.46	0.63	0.38	0.49
Total Seed	1.49	3.38	1.59	3.19
Fertiliser		3.98		4.12
Lime and Slag		0.11		0.78
Sprays		0.68		0.51
Contract and Casual		0.74		1.73
Miscellaneous		0.91		0.67
Total Variable Costs		9.80		11.00

The range in variable costs per acre was from £6.87 to £11.61 for the four seed barley crops. For the 28 feeding barley crops the range per acre was from £6.83 to £16.54 where there was considerable contract work and lime spreading.

Output and Gross Margin

Table VII shows the average output and gross margin per acre. The weights of grain given in this section are as recorded and are not all adjusted to 16% moisture content as in the earlier section on yield.

TABLE VII
Average Output and Gross Margin per Acre

<u>Output</u>	4 Seed		28 Feed	
	cwt.	£	cwt.	£
1. Grain (weights as recorded)				
Sold for malting	2.88	2.56	1.37	1.51
feeding	5.50	5.51	10.39	10.82
seed	21.99	29.58	0.67	0.90
Sub total	30.37	37.65	12.43	13.23
Kept for feeding	3.02	2.83	19.57	19.03
seed	0.50	0.68	0.33	0.41
Sub total	3.52	3.51	19.90	19.44
Total Grain	33.89	41.16	32.33	32.67
2. Straw				
Sold	19.85	4.18	5.17	1.11
Kept	7.03	1.71	16.73	4.00
Total Straw	26.88	5.89	21.90	5.11
3. *Deficiency payments etc.		5.80		5.53
Total Crop Output (1+2+3)		52.85		43.31
Variable Costs (Table VI)		9.80		11.00
Gross Margin		43.05		32.31

*Acreage deficiency payments, premiums, H.G.C.A. contracts.

The range in output per acre was from £46.00 to £56.08 for the four seed barley crops and from £25.83 to £55.79 for the 28 feeding barley crops. The remaining gross margin per acre was from £36.03 to £46.49 for the four seed barley crops and from £18.05 to £48.58 for the 28 feeding barley crops.

Yield and Gross Margin

The importance of yield is brought out in the following table which shows the relationship of yield to gross margin for the 28 farms with mainly feeding barley crops.

TABLE VIII
Relationship of Yield to Gross Margin
Results Expressed per Acre

Distribution of Farms	Yield	Average Yield (16%)	Average Output	Average Variable Costs	Average Gross Margin
No.	cwt.			£	
1	Over 40.0	41.3	55.79	11.48	44.31
8	35.1 to 40.0	37.7	50.20	10.34	39.86
7	30.1 to 35.0	32.5	44.15	11.08	33.07
10	25.1 to 30.0	28.5	39.16	11.81	27.35
2	25.0 and under	18.2	27.35	9.10	18.25

SECTION 3

DEFINITIONS AND METHOD

Seed

Purchased seed has been charged at cost. Home-grown seed has been charged at market value.

Fertilisers

Fertilisers, lime and slag have been charged at net cost (i.e. subsidy has been deducted). No credit has been given for manurial residues. Similarly no charge has been made for any dung applied.

Miscellaneous

Included here are the costs of fuel for self-propelled combine harvesters, all other fuels and power (e.g. oil for driers and electricity for blowers etc.) other than tractor fuel. Baler twine and bags etc. are also included under miscellaneous. Sprays have been shown separately.

Contract Work and Casual Labour

These have been charged at the rates paid.

Averages, Weighted and Unweighted

Averages throughout the report are unweighted except in Appendix Table V where they are weighted.

Gross Margin

Variable costs only have been charged against the output. Fixed costs such as rent, regular farm labour and farm tractors, equipment depreciation and overheads (share of general farm expenses) have not been charged.

SECTION 4

APPENDIX TABLES

TABLE I

DISTRIBUTION OF VARIABLE COSTS

Variable Costs £ per acre	Distribution	
	4 Seed	28 Feed
Over 15.00	-	4
13.10 - 15.00	-	2
11.10 - 13.00	1	6
9.10 - 11.00	2	8
7.10 - 9.00	-	7
5.10 - 7.00	1	1
Total	4	28
Range	£6.87 to £11.61	£6.83 to £16.54

TABLE II

DISTRIBUTION OF TOTAL OUTPUT

Total Output £ per acre	Distribution	
	4 Seed	28 Feed
55.10 - 60.00	2	2
50.10 - 55.00	1	5
45.10 - 50.00	1	3
40.10 - 45.00	-	7
35.10 - 40.00	-	9
30.10 - 35.00	-	-
25.10 - 30.00	-	2
Total	4	28
Range	£46.00 to £56.08	£25.83 to £55.79

TABLE III

DISTRIBUTION OF GROSS MARGIN

Gross Margin £ per acre	Distribution	
	4 Seed	28 Feed
45.10 - 50.00	2	1
40.10 - 45.00	1	5
35.10 - 40.00	1	4
30.10 - 35.00	-	8
25.10 - 30.00	-	5
20.10 - 25.00	-	3
15.10 - 20.00	-	2
Total	4	28
Range	£36.03 to £46.49	£18.05 to £48.58

TABLE IV
SUMMARY OF AVERAGE YIELDS AND RETURNS

	4 Seed			28 Feed		
	Yield	Per Acre	Per Ton	Yield	Per Acre	Per Ton
	cwt.	£	£	cwt.	£	£
Grain sold:						
malting	2.88	2.56	17.78	1.37	1.51	22.04
feeding	5.50	5.51	20.04	10.39	10.82	20.83
seed	21.99	29.58	26.90	0.67	0.90	26.87
Grain kept:						
feeding	3.02	2.83	18.74	19.57	19.03	19.45
seed	0.50	0.68	27.20	0.33	0.41	24.85
Total Grain	33.89	41.16	24.29	32.33	32.67	20.21
Straw sold	19.85	4.18	4.21	5.17	1.11	4.29
Straw kept	7.03	1.71	4.86	16.73	4.00	4.78
Total Straw	26.88	5.89	4.38	21.90	5.11	4.67
Acreage payments, premiums, H.G.C.A. contracts		5.80			5.53	
Total		52.85			43.31	

The malting grain sold in the seed group was sold straight off the combine at 19½% moisture content, hence the lower price.

TABLE V
SUMMARY OF AVERAGE QUANTITIES OF MATERIALS ETC. USED PER ACRE

Material	32 Costings		
Seed:			Overall Average per Acre
			1.01 cwt. 0.53 cwt.
Purchased			
Home-grown			
	Area dressed only		
	Acres	Average per Acre	
Farmyard manure*	348	10.60 tons	1.20 tons
Straights - Nitrogen	564½	1.24 cwt.	0.23 cwt.
Compounds	3026¼	2.85 cwt.	2.80 cwt.
Lime	612¼	1.65 tons	6.57 cwt.
Slag	34	0.82 tons	0.18 cwt.

*Slurry was applied to an additional 27 acres
not included in the 348 acres.