For private circulation.

EDINBURGH AND EAST OF SCOTLAND

COLLEGE OF AGRICULTURE.

SOME FACTORS IN SUCCESS.

Border semi-arable sheep farms in 1929-30.

by

E. Whittaker, B.Sc., N.D.A. (Hons.),

Advisory Officer in Agricultural Economics.

Edinburgh, 13, George Square.

1931.

Foreword. In an area where many of the farmers keep accurate financial accounts, economic research, very properly, has commenced with an investigation of these accounts.

Research is being done upon two distinct types of agriculture - (a) semi-arable sheep farming in the Border Counties, and (b) arable farming with sale crops as the bbjective in the Lothians and counties north of the Forth.

Some farmers are more successful than others. The object of the investigation is to discover wherein the "goodness" of the "good farmer" lies. Some of the factors in success may be under the farmer's control, for example he may be able to increase the proportion of sheep carried by his holding should sheep be more profitable than other stock. Alternatively a factor may be something the farmer himself cannot change. If heaviness of soil is a cause of non-success the farmer cannot "by taking thought" alter this, although he may seek a rent reduction or change his farming system. Accordingly, even at a time when, in certain types of arable farming, 'successful' men are merely those whose failure is less disastrous than that of their neighbours, no apology is made for the title chosen for the present publication.

*****

THE TYPE OF FARM DEALT WITH. Farming in Berwick, Roxburgh, and Selkirk, depends characteristically on livestock, sheep being more important than cattle. The hill breeds of sheep, Blackface and Cheviot, predominate on the high land of the North and West. Farms at intermediate elevations carry both Cheviot sheep, for Half Bred lamb production, and Half Bred stocks. Half Bred ewes, bred to Down tups, characterise the low ground.

Cattle are important, most so on some of the lower farms. Arable crops are, in the hill districts, principally oats and turnips, and confined to small areas of the best land. With decrease in elevation, the cultivated area rises, and the rotation shortens, a long rotation (grain, roots, grain, followed by grass for several years) giving place to a five-course (with two years of grass), and finally a four-course rotation.

Thus the area shows a gradual change, the chief causal factors being elevation and land quality.

CLASSIFICATION OF THE FARMS. Amongst farms of similar general type the quality of the land is an obvious basis on which to classify the holdings. Rent and elevation were used in 1928-29 to measure this. The accidental considerations which result in widely different rentals for similar land make this method open to objection when applied to individual farms. To surmount the difficulty in 1929-30 "net production" per acre has been taken into account also.

"Net production" is calculated as follows:-

Stock. With each class of livestock, purchases are deducted from sales (money values). If the valuation has increased, the increase is added. Conversely, any decrease in valuation is deducted.
Crops. The calculation is performedsimilarly for each crop, the only purchases falling to be deducted being seed grain and potatoes.
Total "Net production". The amounts of each product, obtained as described, are added.
Feedingstuffs cause a difficulty, since one farmer sells off grain and buys feedingstuffs, whilst his neighbour feeds home grown grain. To eliminate this complication, the cost of purchased feedingstuffs is deducted to give the final "net production" figure. What would be, otherwise, a higher production per acre on the grain selling farm is thus brought down to a figure comparable with that of the farm consuming home grown grain (i).

TWO GROUPS OF FARMS. Thus classified, the farms investigated fell into two well defined groups:-

1. Farms at low elevations (up to about 500 feet), rented at from 25s. to 35s. per acre roughly. Approximately 40 per cent of the land is under crops other than grass. The ewe stock is Half Bred, bought as ewe lambs or gimmers, bred to Oxford and Suffolk rams, and sold after the third or fourth crop of lambs. Lambs are sold store or fat according to the farm. Nineteen of these farms were dealt with, eighteen in the Borders and one, run on similar lines, in Fife. They averaged 526 acres in area. Their "net production" was from £4.10s. to £6.15s. per acre.

2. Higher farms (with elevations of about 600 feet), and rented at around 15s. per acre. These farms have roughly 20 per cent of their area under crops other than grass. They carry flocks of Cheviot ewes (breeding Half Bred lambs), or occasionally Blackfaces, as well as Half Bred stocks. Most of the lambs are sold as stores. Seven such farms, averaging 867 acres, were investigated. Their "net production" per acre was from £3 to £4.10s.

ADJUSTMENTS TO MAKE THE RESULTS OF THE DIFFERENT FARMS COMPARABLE. To place all the farms on a comparable basis as regards financial results, certain adjustments have been made.

(a) Labour. No charge was included for the labour of the farmer or that of his wife. All other labour, including that of sons employed at home, was

---

(i) It is recognised that "net production" as calculated above differs from"production" as ordinarily stated. In view of the current situation where different farmers are using large and widely varying proportions of home grown oats as a substitute for feedingstuffs hitherto purchased, it is thought that the method of calculation is justified.

charged.
(b) Interest. Each farmer was assumed to have sufficient capital to operate his farm. All interest paid on money borrowed, or received for capital lent, was eliminated.
(c) Valuation of growing crops. On farms where growing crops are valued annually, the fall in prices during late years, has resulted in a loss on this account. If the valuation is made on sound lines it is undoubtedly better to value growing crops than to carry them at a fixed value from year to year. Most farmers, however, adopt the latter practice. Accordingly, so that the results may be comparable, growing crops have been kept at a fixed value in all cases.
(d) Date of valuation. Certain adjustments have been made to place accounts closed at dates differing from the usual one (the May Term) on the same basis as far as possible.
(e) Grazing land. Any grazing land taken has been included with the farm.

******

COMPARISON OF FINANCIAL RESULTS OF DIFFERENT FARMS.

1. LOW-GROUND FARMS CARRYING HALF BRED EWE STOCKS.

(a) Relation between intensity of production and profits.

One point arising from the comparison of results was the relation between "net production" and profits. "Net production" - i.e. sales adjusted for valuation changes, and with purchases of the same article deducted - corresponds to the term "gross profit" as used by some accountants. Even deduction of purchased feedingstuffs conforms with the practice of a few farm accountants. It is, perhaps, not surprising that the gross profit arising on farms should influence net profit. If the connection were seen to persist over a period of years it would seem sound for the farmer to aim at a high gross profit rather than "cut down costs", but this, of course, remains to be seen.

In 1929-30, on these farms "net production" per acre ranged from £4.10s. to £6.15s. The holdings whose "net production" was below £5 per acre showed losses, after which returns increased steadily with rising "net production". This is indicated by the following tables:-

	Five farms with highest "net production" per acre.	Five farms with lowest "net production" per acre.
"Net production" per acre.	£6:11: 5	£4:15: 2
Expenses (other than feedingstuffs and seeds deducted). "	5:10: 8	5: 1: 7
Net profit or loss "	1: 0: 9 profit.	6: 5 loss.

It should not be concluded from these figures that farms with a high level of production are necessarily most profitable. The higher-land group described in the latter part of the present publication produced less per acre, but were nevertheless more profitable, than farms in the group considered here. The most profitable level of production is a matter of natural conditions and price levels, and may, on the same holding, change from year to year.

(b) Relation between type of product and profits.

In the year under review (1929-30) the relative proportions of cattle and sheep produced by the farms seemed to have little bearing on profitableness. Thus:-

	Five farms with highest profits.	Five farms with lowest profits.
"Net production" of cattle.	27.2	32.2
" " sheep.	57.3	59.0

(all per cent of total "net production").

In contrast to this position, in the previous year (1928-29), the relative proportions of cattle and sheep produced had a very great influence on profitableness. The difference between the two years in this respect is shown by the table following, the data being obtained from twelve farms whose accounts were investigated in both years.

	Five farms producing, in 1929-30, over £60 worth of cattle to £100 of sheep.	Seven farms producing, in 1929-30, less than £60 worth of cattle to £100 of sheep.
Profit or loss per acre in 1928-29.	3s.7d. loss	12s.6d. profit.
" " 1929-30.	6s.2d. profit.	5s.8d. profit.

Apparently, in 1928-29, cattle did badly and sheep comparatively well. In that year, accordingly, total "net production" per acre had no direct connection with profitableness (since a high"production" might be either sheep - which were profitable - or cattle - which paid badly). In 1929-30, cattle were more profitable than in 1928-29, and sheep less so. In the latter year farms with a high total "net production" were successful, generally speaking, regardless of whether cattle or sheep were produced.

The comparison of the results from cattle and sheep given above refers only to twelve farms whose accounts were included for both years. It may be mentioned that two farms only showed exceptional results - explained by their special circumstances. The whole group gave for 1929-30, the following figures:-

Eight farms producihg over £60 worth of cattle to £100 of sheep.

	Eight farms.	Two farms with highest profits.	Two farms with lowest profits.
Total "net production" per acre.	£5:16: 9	£6:12: 2	£4:19: 5
Expenses "	5: 9: 3	5: 9:10	5: 6: 2
Profit or loss "	7: 6 profit.	1: 2: 4 profit.	6: 9 loss.

Eight farms producing less than £50 worth of cattle to £100 of sheep.

	Eight farms.	Two farms with highest profits.	Two farms with lowest profits.
Total "net production" per acre.	£5: 6: 6	£5:12: 5	£4:10:10
Expenses "	4:19: 4	4:12: 6	5: 2: 3
Profit or loss "	7: 2 profit.	19:11 profit.	11:5 loss.

Some analysis was undertaken to determine the reason for this change in the relative profitableness of cattle and sheep over the two years. It was found that the margin between "store cattle" purchased and "fat cattle" sold was £1 per head higher in 1929-30 than in the previous year, whilst, with sheep, animals purchased cost more, and those sold brought less, in 1929-30 than in 1928-29. Receipts for wool fell heavily, being 6s. per acre, as compared with 9s.1d. in 1928-29 (ii). Feedingstuffs costs were reduced from £1.14s. per acre in 1928-29 to £1 in 1929-30 due to (a) lower prices, and (b) excellent yields of oats and increased feeding of of this crop in 1929-30. The fall in feedingstuffs costs was most pronounced on those farms with a high production of cattle.

As between different farms it was noted that the ratio of sheep purchased to those sold was highest on the unsuccessful farms. The five farms with highest profits purchased 24.7 sheep per 100 disposed of, whilst the five with lowest profits bought 47.5 per 100 disposed of. Evidently the more successful farms provided a higher proportion of their store sheep requirements by home breeding than did the less successful holdings.

(ii) Figures comparing sales of crops and wool during 1929-30 with those of the preceding year have been adjusted to allow for differences in the amounts carried over in the valuations.

(c) Relation between proportion of land under cultivation and profits.

The proportion of the farms area under cultivation seemed to have some effect on profits. The five farms whose proportion of cultivated land was highest (52.1%) showed an average profit of 1s.9d. per acre, as compared with 10s.3d. profit per acre on the five farms with least land under cultivation (31.7%). Sale crops are not, however, important on farms of this type, accounting for only 25% of total "net production".

Record yields were obtained on many of the farms in 1929. As a result, the receipts per acre for wheat and barley sold during 1929-30, were maintained in spite of lower prices. Sales of the two crops accounted for £7.18s.10d. per acre grown, against £7.8s.5d. in 1928-29, notwithstanding falls in prices from 9s.6d. to 7s.6d. per cwt. in the case of wheat, and from 10s.8d. to 8s.5d. for barley. Sales of oats fell from £3.10.8d. in 1928-29 to £1.9s.5d. in 1929-30 mainly due to increased feeding of this crop. Lower prices were reflected by a fall in potato sales from £15.15s.6d. in 1928-29 to £5.14s.8d. in 1929-30 (ii).

(d) Factors influencing cost of labour.

Labour costs seemed to vary but little with the relative proportions of cattle and sheep. The five farms with highest proportion of cattle (cattle production £96 against £100 sheep) showed a labour cost, inclusive of workers' allowances, of £2.3s.11d. per acre of the farm area. The five farms with lowest proportion of cattle (£28 cattle to £100 sheep) cost £2.2s.6d. per acre for labour.

Labour costs varied more widely with the percentage of land under cultivation. On the five farms with most land under cultivation (52.1%) labour cost £2.9s.4d. per acre, compared with £2.1s.7d. per acre on the five with least cultivated land (31.7%).

(e) Relation between soil type and labour costs and profits.

There seemed a very definite connection between soil type and both labour costs and profitableness. This fact was noticed in 1928-29, but not mentioned in the report for that year as it was thought the effect may be seasonal. The following figures were obtained for 1929-30.

	Five farms whose soil was described as "heavy".	Fourteen farms whose soil was described as "medium" or "light".
Labour cost per acre.	£2: 7: 5	£2: 2: 5
Rent "	1: 6: 7	1: 7: 0
Other expenses "	1:13: 9	1:13: 6
Total expenses "	5: 7: 9	5: 2:11
"Net production"	5:12:11	5:12:10
Profit "	5: 2	9:11

It may be mentioned that there was no important difference in the proportions of cattle, sheep, and arable crops, produced by the two groups of farms. Per acre of the farm area the heavy land cost 5s. more to work. This higher labour cost was not counterbalanced by lower rentals, and, accordingly, profit was less by a corresponding sum.

******

2. HIGHER - LAND FARMS CARRYING BOTH CHEVIOT (OCCASIONALLY BLACKFACE) AND HALF BRED FLOCKS.

Seven farms of this type were investigated in 1929-30. One of them, however, having a dairy herd, was excluded from some of the tabulations. The difference in production between the two groups appears from the table following:-

	Six high-land farms.	Nineteen low-ground farms.
Total "net production" per acre.	£3:13:11	£5:12:10
"Production" of cattle	21.7%	31.1%
" sheep	73.5	55.1
" crops	12.3	25.5
" miscellaneous.	5.0	6.5
	112.5	118.2
Less purchased feedingstuffs.	12.5	18.2
	100.0	100.0

(a) Relation between intensity of production and profits.

There was some indication that farms with high "net production" were most profitable. Thus:-

	Three farms with highest "net production" per acre.	Three farms with lowest "net production" per acre.
"Net production" per acre.	£4: 0: 6	£3: 6:11
Expenses (other than feedingstuffs and seeds deducted).	2:18: 2	2:12: 6
Profit	1: 2: 4	14: 5

The number of farms is, however, insufficient for such a comparison to be reliable.

(b) Relation between type of product and profits.

As may be expected, this group of farms showed considerably higher profits per farm than did the preceding group, i.e. an average of

£839 as compared with £231 on the nineteen low-ground holdings. Even their profit per acre was higher, 18s.5d. against 8s.9d. in the low-ground group.

Three farms were under investigation during both 1928-29 and 1929-30. They showed higher profits in the latter year at 19s.3d. per acre compared with 14s.11d. in 1928-29. In contrast with the nineteen farm group, sheep on these farms apparently did better in 1929-30 than in 1928-29, breeding sheep being purchased cheaper, and the draft ewes and store lambs sold bringing higher prices, than in the preceding year. Receipts for wool, however, fell as before. Cattle, as before, showed a slightly higher margin, and purchased feedingstuffs cost less. It was interesting to note that, on farms of this type, there was a much smaller increase in the home consumption of grain, sales of oats increasing from £1.14s.3d. per acre in 1928-29 to £2.10s.2d. in 1929-30 due to the heavy crop of 1929.

The more successful farms in this group both bought and sold their cattle at lower prices, and presumably therefore at younger ages and lower weights, than did the less profitable holdings. Thus:-

	Three farms with highest profits.	Three farms with lowest profits.
Average price per head of cattle purchased.	£12:19: 8	£15:13: 2
" " sold.	18:13: 8	26: 1:10

Further, the more profitable farms provided by home breeding a greater proportion of their store cattle requirements, the three farms with highest profits purchasing only 43 head of cattle per 100 disposed of, against 100 purchased per 100 disposed of on the three least successful farms.

******

The figures and conclusions presented here are given in the hope that they will prove useful, or at least interesting, to Border farmers. The appreciation of the Economist is expressed for the assistance, given so readily by farmers and accountants, without which the investigation would be impossible.

******