THE AGRICULTURAL SURVEY OF HAWKES BAY.

ITS NATURE AND SOME OF ITS PRELIMINARY RESULTS.

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The Agricultural Survey is part of a comprehensive survey of the economic and social services of Hawke's Bay.

The survey was inaugurated at the request of and in co-operation with the Hawke's Bay Development League, which has given financial and other valuable assistance in the work.

WHAT IS AN AGRICULTURAL SURVEY?

An Agricultural Survey aims to secure, compare , analyse and interpret such facts as are available relative to all phases of farming, including such questions as land utilisation, farm organisction, farm income, costs, farm transport, and marketing , crop husband ry and animal husbandry.

The Survey is concerned first of all with things as they are and not as they ought to be.

It is fully recognissd, however, that there is an immense amount of information possessed by farmers about. their own farms and districts, because each farmer willy-nilly is the director of an experimental station - his farm. If we can collect and properly interpret the experiences and experiments of a suffioient number of farmers we may reasonably expect to obtain valuable guidance about:-

1. Things as they are.
2. Things as they ought to be; i.e., the lines along which progress may be made.
3. Things of which the knowledge is insufficient to indicate how they ought to be; i.e., the unsolved problems of farming.

GENERAL FEATURES OF THE FARM SURVEY WORK:

The work may be divided into two main sections - farm management 'and farm practice - which, however, tend to merge into each other at times, so that occasionally it becomes difficult to say whether a matter is one of farm management or farm practice.

In farm practice matters the unit of study is the crop or the farm animal.

Typical farm practice questions are, what soils are suitable to lucerne and what fertiliser or combination of fertiliser gives most economic results with mangela.

In farm management the whole farm is the unit of study and SO each crop and class of stock and its treatment must be considered in its relation to the farm as a whole and especially in its relation to the net total farm income. Typical of farm-management questions are:- Should lucerne be grown? Shou Id mangels be grown?

An important practicsl'aspect of farm management studies in which the whole farm is the business unit is that enterprises which separately give unattractive net returns in combination may give quite attractive net returns. This question of enterprise-combination is being given attention in Hawke's Bay because there promises to be a growing North Island market for,

say, barley and peas to be used in pig fattening in the main dairying di-s tric ts. Can Hawke 's Bay prof i tab ly participate in this and at the same time 'increase special forage production for use in its own sheep farming?

SPECIAL FEATURES OF THE SURVEY.

Two 'special features of the survey warrant attention:

1 . All information given by farmers is confidential to the Department-'
2. All findings or recommendations are based on actual local field results under conditions similar in essential respects: e.g., if liming is recommended its nature has already been demonstrated in the field,

SOME RESULTS APPLICABLE TO SHEEP FARMING.

Farm survey studies so far have been restricted to Central Hawke 's Bay wi th Hastings as the centre. The Survey districts considered in this discussion are: Te mata, Heretaunga, Matapiro, Maraekakaho, Puke tapu , Patoka, . Kidnapper and Tangoio.

From the farm survey viewpoint this area falls naturally into four main divisions:

1. The Heretaunga Plains, of which brief mention will be made later.

2. The area in which stock fattening is the main source of revenue, wool being of relatively minor direct importance. Products sold principally are fat lambs, fat old ewes, and fat cattle. Breeding ewes are bought in.

3. The area in which flocks are bred on the farms in which some fattening is done. Both fat and store stock are sold.'

4. The area devoted wholly to the breeding of store 'stock which together with wool constitutes the main source of revenue.

CAN THE PRESENT BOUNDARIES OF MAIN MANAGEMENT TYPES BE ALTERED PROFITABLY AND PRODUCTION WITHIN THESE AREAS RAISED.

A question of greatest practical. bearing on the future farm production and farm organisation of Hawke's Bay is whether both the above questions can be answered in the affirmative.

With regard to the first of these questions • In normal price level circumstances, *on* country suited to it, fat lamb production is more remunerative and hence more desirable than any other class of sheep farming. (Stud breeding being not considered.) Hence, it becomes necessary to consider whether the purely fattening area could be extended.

There is considerable evidence available to show that in the mixed breeding and fattening country this can be and is being done by a few farmers, whose farms are typical of much of the mixed breeding and fattening country. In general, the change to dominant fattening country could be made chiefly by,,:-

1. The renovation following ploughing of. as much as possible of the pastures . In general from half to a quarter of the area of the farms examined in this mixed breeding-fattening belt is ploughable, The first step then would be to use the plough as much as possible to establish good pastures.

2. The adoption of a regular and more extensive phosphatic top-dressing programme relative to the good pastures..

3. Particularly in the poorer portions of the breeding-fattening country, the greater use of subterranean clover.

Similarly, it is held that the mixed breeding and fattening country could be extended to include some country which to-day is devoted practically wholly to store-stock production, occasional drafts of fat stock being produced only in unusually favourable circumstances.

The factor determining the amount of change to fattening that can be made is the amount of ploughable country on the individual farm. Some of the holdings on the store country have but little ploughable land and the present knowledge does not Justify saying that such holdings can profitably undertake fattening.

What can at times be done on store stock producing farms with ploughable country has been well exemplified on a property of 3,300 acres, which fifteen years ago carried 2,000 dry sheep and 1600 ewes, producing 1,200 - 1,300 lambs, the average wool clip being sixty bales, Now it carries 4,000 ewes together with dry sheep and of the ninety rams used, twenty are Southdowns. The wool clip has increased to 145 bales and a recent five-year lambing average was 107%. Only 1,100 Out of the 3,300 acreshave so far been improved.

The methods of improvement recommended for such country are: -

1. The establishment of good permanent pastures,
2. Introduction of subterranean clover to much of this country.
3. Topdressing with phosphates.

With regard to the second question, viz., the raising of the carrying capacity on the individual types, there is considerable evidence to show that increased carrying capacity can be achieved by precisely the same factors as make for the change in type of products, i.e., stores to fats. Increased carrying capacity without change in type of stock produced is frequently the alternative to a change in type of product turned off the farm.

WHENCE THE SUPPLY OF BREEDING EWES?

In view of the present position in regard to the supply of breeding ewes, it may fittingly be asked where shall we be able to get an economic supply of breeding ewes, if the suggested expansion in Hawke's Bay fat lamb production takes place and the breeding ewe requirements of other fat lamb raising districts continues to increase or remain unchanged,

Of basic importance in this connection is the fact that there is evidence that the production of extensive areas of the store country producing hoggets can be increased substantially in an economic manner.

An instance of this is provided in a block which in 1928-29 carried 800 sheep, 500 of which were breeding ewes with an average lambing of 55 to 60%. Last year the block carried 1,100 breeding ewes, with an average lambing of about 87%.

Other interesting facts which have emerged relate to that portion of Hawke's Bay served by the Napier-Wairoo railway. There is evidence that in this area the production, of portions of the extensive volcanic soils profitably can be increased substantially. There is other evidence which, while not conclusive, certainly suggests that the production of other portions of the same area can be increased profitably. Increased traffic in stock and goods would be associated necessarily with increased production of this portion of Hawke's Bay. It seems probable

that better transport for fertilisers, etc. inwards and for stock outwards, will promote considerably the realisation of the farming potentialities.

THE ROLE OF TOPDRESSING.

Ample evidence is available of the economic advisability of topdressing relatively good pastures with phosphates in the area under consideration. As the utilisation of phosphates is often in this connection bound up with rainfall, it is of interest to note that only 4 1/3% of the total area of Hawke's Bay is subject to a rainfall of less than 35 inches, and that only 5¾% of the total area of Hawke's Bay is topdressed, including topdressing of lime alone,.

In the fattening area where topdressing is done, it is almost entirely phosphatic - usually superphosphate - being applied in the Autumn or early- Winter. However, quite a number of farmers do no topdressing while those who do topdress do about one quarter of their farms annually- That the topdressing should be so restricted when the farmers acknowledge generally that superphosphate gives a good result seems not to allow any direct explanation. It probably may be -accounted for partly at least, by the fact that an extensive topdressing programme, when effective, tends to disturb the whole existent farm economy. For instance, effective topdressing brings in its train, as a rule, the need for the greater provision&special feed for use when the feed from the pastures falls below the current requirements of stock and it also necessitates greater capital outlay on stock. On the mixed breeding and fattening farms and on the store stock breeding farms the topdressing position is essentially similar to that on the fattening country.

LAMBING PERCENTAGE AND FLUSHING OF EWES: ON FATTENING FARMS.

On fattening farms the lambing percentages returned an average of 94%, ranging from 85% to 105%, according to varying circumstances , the percentage being estimated on the number of ewes put to the ram and the number of lambs tailed. It has been noticed that in seasons suited to natural flushing, the average lambing percentages are appreciably higher. Further in portions of this block where the rainfall regularly favours natural flushing, the lambing percentage is usually 100% or over.

This experience suggests a 6% to 10% increase in lambing due to appropriate flushing.

The practical question is whether it would prove profitable to provide suitable flushing feed during normal seasons. Because of the early date at which rams are put out in Hawke's Bay the flushing crops satisfactorily used in the South Island might not be sufficiently developed when required. While a final statement at this stage cannot be made, the provision of flushing feed cannot be looked upon as impracticable.

THE RERETAUNGA PLAINS.

Quite an extensive survey of the farming position has been made on the Heretaunga Plains, but, owing to time, only brief mention of some of the results of the work will be made here.

Probably one of the questions which most affects the production of the Heretaunga Plains is the adequate supply of supplementary feed to stock at periods of the year when shortages occur. To exemplify this position meadow hay and lucerne hay is being quoted at £7 a tori and mangels at 25/- to 30/- on the farm, as a result of dry weather in the Autumn months. This state of affairs in Hawke's Bay is by no means rare.

Further evidence for this contention is supplied by dairy

farm figures and lactation curves , which show similar weaknesses to curves plotted for other districts, where supplementary feeding is just as backward.

With regard to other matters dealt wi th 'on the plains such as topdressing, the position is still somewhat obscure and further investigations will. be necessary before definite announcements with regard to these matters can be made.

IMPORTANT CURRENT PROBLEMS.

One important problem about which it is not proposed to venture an answer herein is what should be the complete topdressing programme on relativelygood pastures in the areas concerned.

It is known that under suitable management, such pastures respond profi tably to phosphates , but such questions as the following in the meantime remain without definite answers:-

1. Do some or all of them respond profitably to lime?
2. Do some or all -of' them respond profitably to Potash?
3. Do some or all of them respond more profitably to certain phosphatic manures than others2

In an endeavour to solve such problems a series Of topdressing trials is to be laid- down by the Department of Agriculture, Probably approximately three hundred trials will be laid down in the whole of Hawke 's Bay.

Another impor tan t problem is the economic status of topdressing on the inferior swards occupying unploughable country in the area under consideration. It is intended to carry out field trials designed specially to solve this problem.

Still another important matter about which further definite information is desirable is the extent and method of the profitable use of subterranean clover in the area.

Further important points are high stock mortalities from various causes in certain areas' and the growing Of satisfactory swede crops on freshly broken in pumice country or of satisfactory alternative crops.

RELATION BETWEEN SOILS AND FARMING.

In the work to date the influence of variation in soils is clearly reflected in two distinct respects. In the first place the areas suitable for specific crops, e.g., lucerne and mangels are determined largely by soil type and variations in desirable cropping technique are linked with variations *in* soil characters. In short, between specific crops and soils correlations are in evidence*

In the second place the following generalisation holds for the present: The purely fattening type of management is predominately carried out on soils of natural high fertility.

It would of course, be somewhat paradoxical if the most fertile soils were not so'utilised in an essentially pastoral region.

Further and of prime importance is the evidence indicating that there is at present *no* economic reason for confining the purely fattening type of farming mainly to the soils of natural high fertili ty.

Correlations between specific soils and farm management (as distinct from farm practice) have not been established. This lack of correlation is far 'from surprising when the circumstances receive due consideration. The matter may be illustrated by the

position in a group of four survey district8 in the neighbourhood of Hastings - Te Mata, Heretaunga, Matapiro and Maraekakaho. In these survey district8 (exclusive of the Heretaunga Plains) thirty-six soil types have been defined while three farm-management types dominate.

In the area most of the farms contain two or more types Of soil and the proportion of each type of soil varies from farm to farm so that although two farms may contain the same types of soils they are likely not to be closely comparable because of the differing proportions of each soil,

Further although there are many instances of farm8 composed wholly of one type of soil, in only one case is there a substantial number of farms of one soil type; the 9 farms consisting wholly Of sandy podsoil. Warren of Cornell has recommended 20 farms in a group for farm management studies and as we incline at Present to agree with this view we do not try to generalise from the operations of this 9-farm group-

A second aspect of this matter is of considerable moment; the farming of Hawke's Bay is grassland farming. The type of farm management reflects the pastures but the pastures do not always reflect the soils. In short the result8 of the farming survey in Hawke's Bay are in complete general agreement with the following statement from page 81 of Professor Stapledon's "The Land Now and Tomorrow".

"To a very real extent grassland *is* singularly independent of the virginal character of the soil, Soil type is, however, a predisposing cause towards either good or. bad grassland but good management and adequate manuring can lead to the development of tolerably good grassland on any soil which Great Britain has to offer while bad management will mask the virtues of the most beneficent soil."

TO SUM UP.

Though the agricultural survey is far from complete, certain important facts have already emerged relative to the farming of Central Hawke's Bay under normal price-level circumstances. Among the major of these are:

1. The production of many of the present. dominantly fat-stock-production farms profitably can be increased substantially.

2. In many instances farms which at present produce both fat-stock and store stock profitably could be devoted to fat-stock productic

3. Mixed breeding and fattening of stock could more frequently be carried out profitably in the area in which the majority of the farms are now devoted to breeding exclusively.

4. The carrying capaci ty of a substantial portion of the area which is and may continue, to be devoted exclusively to breeding profitably could be increased considerably.

The first three' of these facts point to the possibility of an increased proportion of fat lamb in our export trade. Thi 8 would be especially valuable should any tonnage limitation be placed on our exports in which case each pound of meat exported should be Of the greatest possible value. The fourth fact listed above points to a source of the increased supply of breeding-ewes required for an. increased fat-lamb production.