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## RESEARCH, EXTENSION AND THE FARMER

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THE CONCERN which is felt by many for the future of animal production in this country arises from a situation of which all New Zealanders are aware. New Zealand is faced with increased competition on its traditional overseas markets from home grown produce and from surpluses imported from other countries. As a result, the prices received for wool, lamb, butter and cheese have fallen.

New Zealand has been informed that the United Kingdom market can no longer absorb ever increasing surpluses. It has received more than a hint that when presented with the choice, many of its customers prefer butter possessing better spreadability and colour, and cheese of better texture, quality and flavour. Similarly, there has been a realization that lighter lambs with less fat are demanded from our sheep industry.

A warning has been issued that increasing population is already demanding the diversion of more of our farm output to domestic consumption and that there is a need for increased exports to provide the imports needed to maintain the same standard of living for the greater number of people that was provided for the lesser.

In short, this country is faced with reduced prices, the need to develop additional markets, the need to increase exports and at the same time to divert an increasing amount of our produce to our local market and the need to pay real attention to consumer preferences.

In respect to this last point, it may be of interest to members of this Society to repeat the words of Dr W. M. Hamilton which were part of his presidential address, delivered in 1948. He suggested that when our pool accounts were drawn upon, great care would need to be exercised to ensure that grades or types of produce no longer demanded by the market were not sustained in production. This situation has, in fact, arisen, and the warning given by the President of this Society 10 years ago was not heeded. As the price of butter on the British market has risen to a much higher level than the industry had been conditioned to expect, the

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dairy farmer and his leaders have once again lost all sense of urgency on this matter, and relapsed into an uneasy *status quo*. The fact that the current price level is probably temporary makes this attitude completely inexcusable.

An ignorant research officer, unversed in the intricacies of international trade, finds it difficult to believe that there is any real opportunity for a great expansion of markets in Europe, except at a reduced price, and is naive enough to believe that markets are dependent on prices, that prices are related to costs, and costs are related to efficiency; and it is with the efficiency of animal production that the research worker is vitally concerned. This interest stems from the fact that the aim and object of agricultural research in this country is, directly or indirectly, to increase the efficiency of farm production. This may be regarded by some as being a restricted description of the research workers' aims, and as an unduly practical definition. The purist might like to think that this is so, but the fact remains that there are very few projects at present being operated within the Animal Research Division of the Department of Agriculture, at least, which are not of immediate interest to the farmer. There are some which appear to deviate from this aim, but they are usually being pursued to find the basic principle behind some function or response which is, itself, of practical importance.

Let it be accepted, then, that our activities are broadly practical and that experiments will generally lead to the discovery of facts or the enunciation of principles which, when made known to the farmer by the extension worker and applied to his farming operations, will lead to more efficient production.

It is true that a research worker derives only slightly less satisfaction from seeing his results applied to industry than he obtained from their actual discovery. Is it to be wondered, then, that many research workers today feel frustrated and appalled at the hiatus which exists between the publication of the results of research and their application?

A research worker cannot remain disinterested in the fact that the knowledge that he and his colleagues, both past and present, have garnered, remains largely unused and unapplied, misinterpreted or wilfully ignored. It is beyond belief that it need be an accepted principle of research and extension work that in this day of radio and cinemas, of farmers' conferences, agricultural journals and daily newspapers, of extension services, farm improvement clubs and producer boards, there must be a time

lag of 20 years between the enunciation of a principle and its application to the farming industry. As an American friend of the writer's expressed it, "It's amazing the number of farmers who drive 1959 automobiles and use 1939 farming methods."

Lest the picture painted be considered too gloomy, it must be admitted that the results of some classes of research work have found ready acceptance. Examples could be cited of the use of antibiotics in the control of mastitis; the application of copper to peat land, and cobalt to bush sick areas; or the wide acceptance of the round house by the pig industry. These measures are, however, born of necessity. They are essential to the continuation of farming in the areas where such deficiencies occur or are an effective attack on obvious and easily computable losses. Such remedies have an immediate appeal. Of a similar nature is the wide use of Strain 19 abortion vaccine, a simple service consisting of a single injection performed by a veterinary surgeon or livestock instructor.

While diseases are important to the man on the land, in the broader terms of animal husbandry, they are merely interruptions in the development and maintenance of efficient production. Nationally, the real exploitable potential of farming lies in the establishment of a proper soil environment for optimum plant growth, the use of the most productive plant species available and their full utilization by efficient men and efficient beasts. Any difference which arises between actual and potential production in any one of these basic phases of farming operations is not easily detected by the farmer and is not easily pinpointed by the extension worker, whose job it is to advise him. It is, therefore, in these fields that research is most important, extension most difficult, most lacking and most sadly unco-ordinated, and the farmer least aware of his need for advice.

It is these three steps to increased efficiency of production, research, extension and the farmer application, which will be examined more closely in this paper, and in doing so it will become evident that the problems which arise within each have been adequately dealt with in the past by members of this Society in the course of presidential address or papers in open meetings.

In view of the remarks which will shortly be made when dealing with various institutes and departments, it is only proper that one should question the efficacy and usefulness of this Society in improving animal production. When the warnings which have been given, the reasoned and authoritative statements that have

been made, the future policies which have been recommended, appear in fact to have had little effect upon the course of agricultural policy in this country, it would seem that the Society would serve a useful purpose if it adopted some of the techniques of a good extension officer and made a point of acquainting industry leaders, departmental heads and ministers of state with the substance of papers which are relevant to their industries, departments or ministries. It is very probable that many of the men occupying these posts are like the somewhat inefficient farmer: they are unaware of the expert advice available to them or do not recognize their need for that advice.

### **Steps Towards Greater Farm Efficiency**

Let us now examine the first step towards greater farm efficiency, namely agricultural research.

Dr de Brunner of Columbia University, has stated the axiom—that research provides the advisory service with the basic knowledge that it extends. The role of the research worker is to supply the results of his investigations to the extension worker in a form that can be easily understood. It has already been stated that most, if not all, of the problems which are being investigated by the Animal Research Division, and one has the impression that the same situation holds in other research institutions, are directed at the solution of practical problems. It is also true that for the most part the problem to which each individual worker addresses himself is of his own choosing. At Ruakura, for instance, each research officer is associated with a specific phase or type of animal production, which he himself has selected and with which he is expected to become fully conversant on both the practical and theoretical plane. From this field he selects a problem which he hopes is amenable to investigation and the importance of which he can usually assess. As an example of the way in which this is done, the investigations currently being pursued by a number of research workers at Ruakura may be cited. As L. R. Wallace has pointed out, the fat lamb ewe is a relatively inefficient animal in converting grass to meat. The usual single lamb produced in twelve months must bear the whole feed overhead of the ewe for that period. The most obvious method of reducing this feed cost and thus improving efficiency, is to increase the number of lambs weaned per ewe and per flock.

To achieve this end, breeding and selection experiments are being conducted in an attempt to increase the inherent fertility of

the Romney. Crossbreeding is also being examined with the same end in view. The same problem is being attacked through ram fertility studies to ensure the use of only fertile rams during tupping, by observation upon the length of heat periods in two-tooth and older ewes, by the study of mating behaviour and the development of management systems which will ensure that every ewe will be provided with the opportunity of a successful mating. The effect of flushing by nutritional means, and the effect of hormone injections upon ovulation rate are also being examined. While it is obvious that these experiments, all different approaches to the same problem, are of particular interest to geneticists, physiologists, nutritionalists and students of animal behaviour, each if brought to a successful conclusion will be of practical importance, and each will involve changes in farm and stock management. Each will have economic repercussions. The results when published should, as Dr Hamilton suggests, indicate the methods by which the findings can be integrated into current farm practice.

A comment here from Dr J. F. Filmer, which was made during a discussion on extension work at the 1947 meeting of this Society, would not be out of place. He remarked: "Many of our best workers are quite incapable of putting their results over. I can barely understand their papers myself at times, so it is no wonder that they do not get across to the public." A frequent criticism that is levelled at the papers delivered at these meetings is that they have become so highly technical that nobody but an expert in the subject can understand them. There is no doubt that this difficulty could be overcome to a large extent if the authors took the trouble to orientate their audience in the field which is being covered, at the beginning of the paper, and to indicate the application of the results in easily understandable terms at the end.

It would appear, therefore, that research workers are not without blame in hindering the extension and exploitation of their findings by explaining them in an obscure manner.

### **Extension to Extension Workers**

A very distinct difficulty arises at this stage. It would be an advantage if the animal research worker was given an opportunity to explain his findings, no matter how badly, directly to the animal extension officer. As things are, there is very little

contact between the two, and there are many cases of farmers in a district being aware of the results of an investigation before their extension worker—a situation which must be most embarrassing. To quote from C. W. Burnard's paper of 1947, "The underlying weakness of extension work in New Zealand today is that it is nobody's job to translate research to the farmer." To a large extent this is still true today; although both the agricultural colleges and the research stations do hold farmers' conferences, at which research findings are explained and discussed directly with farmers. This type of extension work at which the research worker becomes the extension officer, and where farming problems are discussed in a public hall and from a public platform, can never be as efficient as advice given on the farmer's own fields. It can only be assumed that this state of affairs has arisen because the farmer is desperately seeking help which is not supplied by existing extension services. The farm improvement clubs are partially a symptom of the same disease, and also an indication of the need for overall farm advice.

Colonel T. Durrant, in his presidential address three years ago, and C. W. Burnard in a paper delivered to this Society twelve years ago, have both pointed out the folly of subjecting a farmer to the unco-ordinated advice provided by an extension division whose officers advise on matters relating to the soil and to grass production; the animal industry division whose officers, when not engaged in tuberculosis testing, rabbit eradication, meat inspection and quarantine regulations, to say nothing of attending saleyards to examine sheep for keds and lice, will advise on animal production; pig council supervisors, who will advise on pig production or dairy instructors who will advise on milking techniques. It has also been pointed out on a number of occasions that, whereas each of these officers is considered competent when he has mastered one aspect of the soil, plant, animal complex, the farmer depends for his livelihood on mastering the lot, in some degree at least. In common justice it must be said that the officers from all these divisions are competent, or could soon make themselves competent, to deal adequately with all aspects of farm production, were they given the time and opportunity to do so.

There is little doubt that the most effective farm advisory work being done today is that of the herd consulting officers and the farm improvement clubs, where the extension officer deals with all phases of the production and economics of each farming unit.

J. Cornwell, at the meeting of this Society in 1958, in dealing with this same subject, quotes P. W. Smallfield, now Director-General of the Dept. of Agriculture, as saying: "Personally, I think that concentration on particular subjects in extension work has gone too far, and that any major expansion in services provided should be in farm management. Land, plants and animals should be considered together, and the improvement of farm enterprises planned on a business basis." In view of Smallfield's present position, it seems likely that some improvement in this respect in government extension work can be expected.

### **Integration with Farm Economics**

There are, however, two further factors to be considered. It has been mentioned that a large part of the success of the consulting officers and the farm improvement advisers is due to their considering a man's farming operations as a whole. In addition they do have an extremely close personal contact with the farmer as an individual. Their visits are not single isolated episodes, but are repeated in some cases at frequent intervals. In addition, and probably of even greater importance, is the fact that the adviser employed by a farm improvement club is completely conversant with the financial situation of each of the farmers in his group. He is in a position to decide whether it would be preferable to invest money in drainage, a new tractor, a new cowshed or a new piggery. Farmers who are not members of such clubs are offered advice on each of these possibilities by men who, naturally, prefer to see money expended on projects which are in their own extension field, and who have no opportunity to assess the relative importance of each of the possible avenues of expenditure. Under such circumstances the farmer could, and often does, receive conflicting advice as to the best and most profitable course to follow.

Recognition of the importance of having the complete confidence of the farmer in regard to his financial position and resources leads one to suggest that for the best results extension work should be completely divorced from government departments. It is perhaps lamentable, but true, that the average farmer is not prepared to divulge his financial income and outgoings to a government servant, and it is unlikely that human nature will change sufficiently in the future to allow him to overcome his reticence. Without this knowledge, extension work is hamstrung.

There is little doubt that the farmer, as the final recipient of research findings, and the means through which these findings will be usefully employed or discarded, has received little consideration in extension planning in this country. Dr Hamilton has this to say in his presidential address to this Society eleven years ago: "Surely, of the major factors in production, the farmer is the most important, and probably the most variable, yet the nearest he comes to being studied is as a component of the error variance in the farm management surveys." Similarly, Dr H. B. Low, during the conference of 1954, quotes Dr J. H. Kolb, a visitor to this country, as follows: "The folk in Wellington were quite amazed to find that New Zealand farms carried people as well as sheep and cows." He goes on to say: "I am sure that far too little work has been done to discover whether and to what extent farmers react in the way we think they should. An understanding of these matters is just as important for obtaining increased production as having improved technical methods to offer them."

A further comment on the same subject was made by Cornwell during last year's conference. In reporting his observations upon American agricultural advisory services he states that "In the eyes of the American extension worker, the farmer and his family are at least as important a part of the farm economy as his land and stock, and rural sociologists have set about investigating the nature of the social processes by which agricultural information and techniques reach and are applied by the farmers for whom they were intended."

### **Non-Acceptance of Advice**

Lacking specific information such as American rural sociologists gather, one can only speculate as to what are the most important of the many possible reasons for farmers either not seeking or not accepting advice on their farming problems. Do farmers feel that far too great a proportion of any revenue resulting from increased efficiency will be taken from them in taxation?

Is it because the national land settlement policy has provided them with a farming unit which enables them to maintain a reasonable standard of living even when farmed at a low level of efficiency?

Is it because in the farmer's fanatical insistence on obtaining freehold title to land, most men at the commencement of their farming careers carry a heavy mortgage burden and leave themselves without any working capital? Many farmers in this position

know how to farm better than they actually do farm at the commencement of their career, but by the time they have achieved some financial independence they have lost the ambition to improve.

Is it because the standard of education of many New Zealand farmers is such that they are unable to appreciate the mistakes in their methods or the soundness of the remedial advice which is offered, so that they take refuge in an unchangeable daily routine which requires little thought, minimum effort, and which can only be upset by a major catastrophe? Many examples can be quoted which fit these situations. The magnitude of the task which confronts an extension officer who wishes to exercise a measurable effect upon the efficiency of a group of farmers whose finances, ambitions, intelligence and inclination to work covers such a tremendous range is appalling.

For instance, what sort of effective advice can an extension worker give a farmer who casually arrives at Ruakura and mentions that he has lost 120 pigs in the previous six weeks and has come to the conclusion that he should do something about it? The feeling of complete futility in the mind of the officer can be imagined when he found, on visiting the farm, that the surviving pigs were pasturing on a permanently wet peat swamp, were sleeping in the cosy shelter of a row of 10-year-old gum trees and were being fed a slightly brown solution of molasses and water. Similarly, one can imagine the interest aroused in the Ruakura Diagnostic Section over an obscure disease which struck a local piggery. The clinical symptoms consisted of a pointed protrusion on either side of the tail. This disease had apparently spread throughout the whole of a herd of 500 store pigs. In many cases it was fatal. Happily, in this particular case a profound knowledge of anatomy enabled the diagnostic officers to identify the protrusions as pin bones, and the disease as starvation. There is, however, nothing basically humorous in these situations. They betray such immeasurable ignorance of simple stockmanship and abysmal lack of farming ability that it is doubtful whether such a situation could ever yield a worthwhile return even if an extension officer set up house with the farmer. There is hope and there is much effective work to be done amongst a much more numerous group whose general approach to farming is sound, but who have modified recommended routines without understanding the principles underlying them and in so doing, in many cases, have completely destroyed the application of the principle.

One may quote here examples of milking technique where cows are vigorously stimulated and the machines left on for three minutes, but the farmer has failed to realize the significance of the period of from 5 to 10 minutes which he has allowed to elapse between stimulation and the application of the machine. It is, perhaps, only human nature that the first reaction of this farmer was to criticize the quality of the bulls being used in the artificial breeding programme.

It can be seen that the work of the extension officer involves much more than merely dealing with the apparent problems which the farmer imagines to be the cause of his lack of success; it involves the very close examination of all phases of his operations by a person skilled in observation and soundly instructed, not only in basic principles, but also in their practical application.

### Conclusions

In conclusion, it is proper that a summary be given, in easily understandable terms, why a continued and accelerated increase in the efficiency of farm production is necessary and is not being achieved.

Dr H. B. Low has shown that it is productive efficiency which can reconcile moderate prices for produce with high earnings per man. The members of this Society should stop taking in each other's mental washing, and should make sure that thoughts and suggestions relating to agricultural policy arising from their discussions are made known to those who determine policy and not merely left as a mute protest in its *Proceedings*.

The agricultural research worker, in presenting his results, should show where they apply to the industry. He should explain the modifications to normal practice which their application involves and indicate their possible economic repercussions.

Agricultural extension programmes should be greatly expanded so that farm problems can be dealt with in more detail and in expansion, the soil, plant, animal complex should be regarded as one technical problem rather than three.

Government extension officers are severely hampered in their work through ignorance of the financial situation of the farmers they are seeking to advise, and the only practical method of overcoming this psychological barrier is to divorce farm advisory work from government control.

The most effective way of informing extension officers of the findings of research is by direct contact at frequent intervals between the advisor and the investigator.

The reactions of farmers toward advisory work and toward the economic climate should be studied to increase the effectiveness of extension work.

The 20-year lag between the announcement of research findings and their final acceptance by the farming community can be considerably reduced if the previous suggestions are, in fact, implemented.

Unless an attack is made upon these problems, the New Zealand farmer cannot provide a sufficiently rapid increase in the volume and efficiency of primary production to maintain this country's present standard of living.

At the present time and under present conditions, the effectiveness of research is being drastically reduced and its possible benefits criminally squandered.

Finally, it seems that the only way in which the above suggestions can be implemented is by transferring the control and direction of agricultural extension to the agricultural colleges. This would lend a realism to agricultural teaching and would provide a means of gathering factual information on farm economics and rural sociology. The meetings of this Society should then be held at the colleges where research officers, extension officers and students who are being trained to fill these roles can meet and discuss research findings. Under these circumstances it is surely logical that this Society as such would then cease to exist and that its successor would look upon the soil/plant/animal complex as one overall problem both of research and extension.