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Farm management

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THE ROLE OF FARM MANAGEMENT SURVEYS

W.V. Candler

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Department of Agricultural Economics
and Farm Management,
Massey University of Manawatu,
Palmerston North,
NEW ZEALAND.

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THE ROLE OF FARM MANAGEMENT SURVEYS

(Address by Dr. Wilfred Candler, Professor of Farm Management, Massey University, to the Annual Meeting of the Fertilizer Manufacturers' Research Association, held at Otara, October 27th, 1965).

I want to talk to you this afternoon about the role of farm management surveys in agricultural research and extension. It is a surprising fact that there are very few publications on the methodology of farm surveys. The few comments which have been made by professional farm management workers on the place of farm surveys generally appear as "asides" in the introduction or conclusions of a paper reporting survey results, and, strangely enough, very little new has been added to the ideas already formulated by G.F. Warren prior to World War I.

Warren, in his Cornell Bulletins 295 and 344, made all of the following points:

(i) Farmers' experience constitutes a vast store of information which, on many topics, greatly exceeds anything we could hope to afford to produce through formal research programmes. In 1905 in his An Apple Orchard Survey, Warren expressed the the thought: "Every farm is an experiment station and every farmer the director thereof".

(ii) The survey technique requires the establishment of rapport between the research worker and the farmer. Warren warns against putting a green city boy on to survey work, and has some homely advice about helping the farmer unharness his team, and with any other chores necessary, before the interview can take place.

(iii) Warren argued that by taking large numbers of farms, the contribution of individual farms was small, so that the occurrence of occasional atypical results, would not materially affect the average results obtained. And, strangely enough, this was based on a valid statistical

argument.

(iv) The danger of classifying farms on the basis of effect rather than cause was recognised, and

(v) The possible bias due to correlated inputs, was mentioned.

It is salutary for anyone who might be tempted to think "farm management is a relatively new discipline" to realise that all of the above points had been made prior to World War I. I think, however, there still are a few points which have not been made explicitly about the role of surveys in farm management research.

MANAGEMENT RESEARCH

I would now like to make a few comments on my attitude to management research.

I, personally, feel that there is (or, rather, there should be!) a very close parallel between a firm developing a new product for sale, and the State developing new methods of farming. Further, there should, in my opinion, be a very close parallel between a firm selling a new product, and the State extending information on new methods of farm management.

If we look at farming, there are certain activities such as the design of machinery, development of new chemicals, and possibly processing techniques, where the patent laws allow an inventor to obtain much of the benefit resulting from a new discovery. In these sorts of fields, private enterprise spends large sums on research, because the sponsoring firms can hope to retain most of the benefit from new information obtained. There are other fields, however, such as aerial topdressing, milking shed design, higher fertility/stocking rates, feeding sheds, and the like, where the patent laws do not allow an inovator to charge a royalty on all subsequent adoptions of his new practice. Obviously, in these

latter fields, private enterprise cannot afford to spend a great deal on research, and hence if the national research effort is to be kept at a desirable level in these "non patentable fields", then the government has to sponsor the relevant research.

Thus, there is a case for government research activities where new technology is to be made available to farmers without payment of a royalty. Where a royalty is payable, there is little, if any, need for government research. Rather interestingly, then, we could probably disband all government agricultural research, if appropriate royalty laws were passed. It is, for instance, not hard to imagine the Government's plant breeding research work being conducted by one or more private companies.

I am not, in front of this audience, concerned to argue seriously for the withdrawal of government from the field of agricultural research ^{1/} rather I am concerned to argue that decision making procedures used by private enterprise could (or can) also be adopted in Government research organisations.

Similarly, where a new product (or technique) has been developed by government or private industry, I think there are strong parallels in the attitude that should be adopted in conveying the information to farmers.

When a private company finds a new product which it believes will be useful to farmers, it has no hesitation in bringing the new product to their attention, by advertising and direct contact between sales people and farmers.

In the government sector, however, it has been traditional in New Zealand and overseas to "make extension services and information available

^{1/} Though unless the Government is willing to pay salaries comparable with those ruling in overseas research organisations, I am doubtful if Government research can hope to be very effective.

on request". Few private concerns would make a profit if they took this rather cautious attitude to selling their product, and it is by no means clear to me why the State having paid large sums for research, should be any less keen than a private company to see its worthwhile findings utilised.

The above slight digression has aimed to emphasise that, in my view, exactly the same sorts of problem are encountered in studying and extending a new management system such as increased cows and fertiliser, as are encountered in developing and selling a new type of tractor.

TYPES OF MANAGEMENT SURVEY

Given the above setting I would now like to distinguish four alternative motivations for a management survey.

(i) Descriptive or Exploratory: The first class of survey I would like to distinguish is one in which the aim is purely descriptive. The authors of the survey feel that they need "more information" about a particular topic, without any very clear idea who will use this additional information, or for what purpose it will be used. In this type of survey, there is no "hypothesis" to be tested, nor are there any very clear guide lines as to what information should be gathered, or how the information, once gathered should be arranged.

As an example of what I mean, we might imagine the Agricultural Development Conference had asked for a National Survey of Fertiliser Usage, and that the basic data was to be obtained from interviews with farmers. The idea of such a survey may be thoroughly sound - but in the absence of further information as to what the results are to be used for, the number of farmers and their selection can only be done in a more or

less arbitrary way. It is obvious that the farmers interviewed should be asked the fertiliser currently used, and presumably, method and time of application. It is not evident, however, what else should be asked.

Should the farmer be asked:

- (a) About the previous fertilizer practice, and, if so, how far back should this be traced?
- (b) Should he be asked about farm size, income, indebtedness, production pattern and levels of output?
- (c) Should he be asked about marital status, number of children, age, years of high school education, and other sociological factors?
- (d) Should he be asked about farm development plans and likely future fertiliser usage?
- (e) Should he be asked about alternative fertilisers, spreading methods, and sources of information on these?

This list of possible questions related to fertilizer usage could be extended almost indefinitely.

Depending on who eventually came to use this hypothetical survey, each of the above types of question could be very valuable, but equally they could be superfluous.

A descriptive or exploratory survey can be extremely useful, but exactly because it is exploratory, there is little possibility of being able to talk of collecting the right information. Since there is no hypothesis, there is no way of telling which information is and is not pertinent.

I think the most we can hope for in such a survey is that the people responsible should check to ensure that the survey is necessary. For instance, by appropriate appeal to fertiliser companies, stock and station firms, dairy companies, aerial (and bulk) topdressing contractors, extension

officers, and the like, a satisfactory overall picture of fertiliser usage might be available without the expense of farm interviews. This is a simple precaution which is surprisingly easily overlooked in the heat of designing questionnaires, making travel arrangements, and the other administrative details of carrying out a survey.

It may also be salutary to remember that unless the information collected is used by someone, then it might as well not have been collected. If, however, attempts are made to use descriptive survey data for "analytical" purposes, for which it was not designed the results may be positively harmful. Thus Dudman^{2/} says the descriptive surveys of the English Provincial Agricultural Economics Survey "has had, in my view, a positively harmful effect not merely upon the efforts those whose bent lay more towards original work, but also upon those responsible for the allocation of the scarce professional resources. It is understandable (but not so readily excusable) that, having overseen the collection of large amount of data for one purpose, heads of departments should have wished to persuade themselves that it could be made to yield fruitful results if reworked on other basis and using different methods. A fairly catholic reading of work based on the Farm Management Survey, for example, and published over the last 30 years leaves one reader unconvinced that the records compiled for one not very clearly defined purpose represent (to use the words of a distinguished ex-President of the Society) "a vast mine of untapped wealth for the research worker."

(ii) Research or Pre-Release Surveys: These are surveys designed to see whether there is a "market" for a new product or management practice. That is, the investigator has a definite change in farming practice in mind, but as yet no farmers have made the change, so there can be no

^{2/} Dudman, R., "The Methodology of Research in Agricultural Economics", Journal of Agricultural Economics, Vol. 15, p. 573, (1963).

question of learning from farmers' experience. What the survey can do, is to give a clear picture of what farmers are currently doing, and then attempt to synthesise a picture of the appropriate management system and profitability of farming with the new product or practice.

An example of this type of "research" or "pre-release" survey is available in Alan Frampton's discussion paper "The Economics of Sugar Beet Production On Farms in South Otago".^{3/}

I think this survey is a good example of the use of a pre-release survey. The survey started with the proposition that given certain assumptions about overseas prices, government protection, and technical efficiency, Mr. Campbell McDonald, consultant to the South Otago Sugar Beet Investigation Company, had calculated that it would be possible to pay £5 per ton for clean topped beet at a proposed sugar factory. The obvious questions then were "Will it pay farmers to produce sugar beet at this price? And, if so, will farmers produce beet at this price?"

To answer these questions it was necessary to collate information on the suitable soil types within range of the factory, the present farming systems employed, the other crops which could be grown and to synthesise data on the likely husbandry practices required for sugar beet production in South Otago. This obviously represented a substantial amount of work, but represented information which could be assembled with the co-operation of farmers in the area, appropriate scientific officers of the Department of Agriculture and D.S.I.R., and by reference to publications on sugar beet husbandry overseas. The results of the collation are available in Mr. Frampton's discussion paper.

^{3/} Discussion Paper No, 35 - available from the Farm Management Department, Massey University.

Very briefly, he found that at £5 per ton it would be profitable for farmers to produce sugar beet, but that it was doubtful if the required acreage would be offered. This reluctance of farmers to offer more than a few acres for sugar beet production could be traced to a lack of knowledge of the husbandry requirements for sugar beet production, and the fact that, in many cases, additional labour would have to be employed, and hence it would be difficult to reverse the shift to sugar beet production.

Now, the really valuable findings from Mr. Frampton's study are:

(a) That it is worth examining the possibility of paying £5 per ton for sugar beet, in greater detail, and

(b) That if farmers in the area are to be persuaded to grow sugar beet, at this price, then an extension programme, including growing beet on a field scale and running field days, would be necessary.

In contrast, if Mr. Frampton had found that sugar beet was unprofitable at £5 per ton, then it would have been necessary to concentrate primary attention on whether it was possible to pay more than £5 per ton at the factory, or to reduce growing costs.

Thus, in some situations, farm surveys can profitably be carried out, even though they concern practices which farmers have not yet adopted. If substantial farm investment will be involved in adoption, then the survey costs are likely to be recouped many-fold, from the improved investment decisions of farmers made possible by the survey results.

To my mind, the current explosion of interest in "zero-grazing" is a good example of the sort of situation where a pre-release survey would be likely to be amply justified.

In this connection it would be interesting to know whether "zero-grazing" was amongst the topics recommended to the National Research Advisory Council for investigation, as a result of the recent very exhaustive survey of New Zealand's research needs. Unfortunately, the decision to keep the submissions and report to the N.R.A.C. secret, means that we cannot know what priority was thought to attach to work on zero grazing.

(iii) Post-Release or Early-Adoption Surveys: Thirdly, we can distinguish farm surveys where we are interested in farmers' experience with a new practice. To be useful this type of survey needs to be carried out after a few farmers have changed to the new practice, but before the bulk of farmers have made the change. The importance of the timing of this type of survey is that it can only be conducted after some farmers have had practical experience which can be drawn on, but if the findings are to be useful to farmers in deciding whether and how to adopt the new practice, then it is necessary that many farmers should still have this decision to make.

John Graham's South Taranaki Survey is a good example of an "early adoption" survey. And, of course, his bulletin "Cows, Fertilizer, Production, Profit", should be seen as an integral part of the survey - since the objective of the survey was to assess farmers' experience with high fertilizer and stocking, and hence to help other farmers decide whether to adopt the new management system. The bulletin allowed us to bring the survey findings to the individual attention of all farmers in the survey area. We may note that an "early adoption" survey which does not result in some fairly widely publicised findings, is likely to be a waste of money.

The technique for carrying out an early adoption survey is self evident - you go and ask the farmers concerned, about their experiences with the technique. There is only one source of non-hypothetical information - the farmers who have actually had the experience of adopting the new practice.

An excellent example of the proper timing of an early adoption survey would be to initiate a survey after the first thirty zero-grazing installations have been in use for a year. (That is, on the assumption the Government decides to allow farmers to spend their own money in the way the farmers wish.) This would allow other farmers to judge whether zero-grazing is highly profitable, or whether the purchase of the necessary capital equipment represents money straight down the drain.

(iv) Non-Adoption or Behaviourist Surveys: Finally, we can distinguish "non-adoption" or "behaviourist" surveys, in which we are interested to know why some farmers continue to refrain from adopting a new practice or product. Again, it is obvious that the only way of gathering any information on this question is to ask the farmers concerned - the non-adopters. Given that the experience of adopting farmers indicates a new practice is profitable^{4/} and congenial, three major types of reason for non-adoption can be nominated. These are:

- (a) Lack of information about the new technique or its profitability,
- or (b) Some special restrictions (such as credit, or terms of a share milking agreement) which prevent (or seriously impede) adoption,
- or (c) Satisfaction with the status quo.

The actual conduct of a survey to study reasons for non-adoption would

^{4/} It is necessary, of course, to show that the practice is profitable to the individual, that is, net of tax.

be extremely demanding both in terms of fact, and checking for consistency of replies obtained. It is only human for anyone to refuse to admit to himself that he is either ignorant, or beset by special disabilities, or lacking in drive and ambition! In this situation, not only may farmers be reluctant to admit their real reasons, but they may prefer to excuse themselves by offering substitute reasons. Thus, the man who is simply content with the status quo may profess to be uncertain as to the applicability of new management techniques on his own farm, or to say "there's nothing in it after taxation". And the man who is ignorant of new developments may claim simply to be satisfied with the status quo! Suspect as any results must be, I still feel non-adoption surveys are worth doing - since if we don't do them we cannot come to know anything of reasons for non-adoption.

We have now seen that four main types of farm survey can be distinguished. We can seek for "more information" in general, without any very clear idea how the information is to be used, or we can examine if there is likely to be a place for a change in farm operations, or we can see if such a change is proving successful (once some farmers have commenced to adopt it), or we can examine why some farmers don't adopt (once a new equilibrium has been reached and hence we can identify the non-adopters).

I would now like to consider two aspects of the conduct of farm surveys. The first concerns the need for a questionnaire and the second the appropriate sample size.

CONDUCT OF FARM SURVEYS

In the descriptive type of survey, we might say we are attempting to find out facts about farmers. In the other three types of survey, the pre-release, early adoption, and non-adoption types of survey, we are attempting to obtain facts from farmers.

This distinction between collecting a series of objective facts about farmers and their management practices and gaining an insight into farmers' attitudes and experience, determine in my view, both the desirable form of interview and size of sample.

Thus, in John Graham's South Taranaki Survey he was attempting to learn as much as he could from farmers about their experience with high fertilizer and stocking rates. This dictated a "free form" interview since one farmer might have a great deal to say about wintering systems, whilst another might have a number of novel ideas about handling or reducing farm labour. In this case, it simply is not possible to design an appropriate questionnaire in advance. The most that can be done is to make a "check list" to ensure that all major topics have been touched upon. Having initiated a topic such as wintering, the interviewer simply has to follow along the farmer's reasoning wherever this may lead.

The free-form type of interview which must include a walk over the property, naturally takes much longer - up to a day - than most questionnaire type interviews. This limits the number of farms which can be handled within a reasonable space of time. This dictates a small sample, say 40 farmers, where we are attempting to learn from farmers rather than about them. A more important argument for a small sample in my view, is the need for the research worker to be able to visualise the farm (and farmer) when examining the records of the interview, possibly several months later.

Obviously, interesting, and unexpected, facts will emerge from a careful examination and comparison of the interview results. Points will have been missed and apparently contradictory notes made. It is, therefore, essential that the interviewer be able to picture the farm in his own mind if he is

to avoid drawing medianistic and erroneous conclusions.

A good example of the importance of recollection occurred in John Graham's survey. He found that he had a farmer with a cow to the acre and 10 cwt. of fertilizer, that was not doing terribly well. He had noticed at the time of his interview that there was a mass of feed on the farm, to the point where grass was rotting in some paddocks whilst the herd were being fed a small area of grass behind an electric fence. He concluded that the grazing management on this farm explained the poor performance, and that the grass was being grown alright but the farmer was failing to feed it to the cows.

This brings us full circle to G.F. Warren, who advocated large samples to ensure that "errors cancelled out". This argument stands if we are simply collecting facts about farmers. Where we are learning from farmers there is an argument for small samples, and a very intensive interviewing technique in the hope that the interviewer will be able to identify, and hence allow for, the exceptional situations encountered. For this intensive type of interviewing it is essential that the interviewer be a properly trained agriculturalist, familiar with the management of the type of farm being surveyed, since it is up to him to notice any exceptional comments made by the farmer. And in questioning to follow up these leads.

Where, on the other hand, we are learning about farmers, a large sample can be taken, a full questionnaire can be prepared in advance, and the interviewer (or interviewers) need not know anything about the technology of the industry being studied.

ROLE OF FARM SURVEYS

I would like to conclude with some thoughts about the role of farm surveys in agricultural research.

I personally believe that farm surveys should be much more widely used as an integral part of the national agricultural research effort than has been the case in the past. Farm surveys have three real advantages as a research technique - they are:

(i) Cheap, in that very significant results can be obtained for less than £2,000. (John Graham's survey, including publication of 12,000 copies of the bulletin cost less than £2,400).

(ii) Quick, in that results can be obtained within eighteen months of inception of the project, and

(iii) Flexible, in that a wide range of topics can be looked at without having to purchase specialised research equipment.

It must, of course, be recognised that the results of a farm survey may be the recommendation that certain lines of technical agricultural research be pursued at the research stations. This should not be seen as detracting from the survey technique. It should be recognized as a valuable contribution in helping orient the work of research stations towards farmers' real needs.

It may appear that £2,000 and 18 months do not represent "cheap" or "quick", yet I believe if the full cost, including salaries and preparation of appropriate reports are borne in mind, then there are many situations in which no other research technique can provide as much relevant information as quickly or as cheaply as a farm survey.