EXTENSION AND EDUCATION IN WEED CONTROL IN NEW ZEALAND

P. S. FERENS
Ivon Watkins Ltd., New Plymouth

Summary

The potent part that extension services can play in opening and using channels of communication for the farmer is the theme of this paper. The agricultural chemical industry, it emphasizes, has developed tremendously in the last few years. Coincidentally, there has been an unprecedented demand by farmers for information and knowledge of chemicals and their use in weed control. This is being met by expanding and enterprising services. But the task is complicated. It has called for expert knowledge and experience, so that the extension services have become a force of many and various personalities. There is scope for many kinds of workers, including the specialist. Indeed, extension work itself has become a specialized job, not a splinter department but an integral part of the primary industries. There are numerous ways of getting information to New Zealand's 85,000 farmers. How to do it, and keep on doing it, swiftly and accurately is the challenge to the extension services — how to create a workable, understandable liaison between science and research and the practical farmer.

INTRODUCTION

WEED CONTROL as it is known today is still a new field with frontiers that have not been clearly charted, hinterlands that have not been fully investigated. In some ways, weed control workers are still pioneers. The background of knowledge is still not great; and there is no unequivocal answer to the many questions farmers are asking.

Many people are concerned in the search for information, the sources of which are not clearly defined. The evolution of the agricultural chemical industry, as with any industry or government service, has seen the development of departments dealing with specific subjects and becoming expert in them — weeds, for instance, machinery, pesticides, chemistry, agricultural engineering. From experience and practice, specialists and specialized knowledge emerge.

It is a dull field-man indeed who cannot view field after field treated to control weeds without arriving at some good working knowledge of what can be done and how to go about it. The role of extension in the development of weed control in New Zealand over the past 14 years has suffered because of the emphasis on research. One should not for a moment minimize the importance of research, nor the need for emphasizing it, but one can decry the lack of parallel emphasis on encouraging the use of the knowledge so developed.

It could be said quite freely that in many cases extension has been a potent force in developing the new information often credited to research. This all indicates that the job of the extension man, of whom there are a great number in the Weed Control Conference, is all-important. It is not easy to define what extension duties all these individuals carry out — noxious weed inspectors, farm advisory officers, farm management supervisors, technical

field personnel of commercial organizations, etc. It is not a cut-and-dried position, not one of performing old tasks in old ways all the time, but a new, developing, and exciting challenge. In many cases it takes the best people available to do a successful job of extension in the field of weed control. There is a future in this field, and the extension or advisory specialist is, and will always be, in the thick of it.

THE NEED FOR EXTENSION OR ADVICE

It is, of course, one of the prime objects of the New Zealand Weed Control Conference to disseminate information, and it must be a matter of concern to many members if the farmers' needs for advice and education are not being met to the full. The development of chemical weed control has been one of the most remarkable post-war developments affecting agriculture, and the rapidity with which these products have been taken up by farmers surely makes nonsense of the often repeated statement that there is a 20-year gap between research and application of the results in agriculture.

GENERAL

Those who have been members of this Weed Control Conference from the early days appreciate how little was known about chemical weed control in those days, and yet how far progress has been made in the last 15 years in the development of this new science and its application on a world-wide scale. The stage has now been reached where there are some 70 or more separate chemicals recognized for their herbicidal properties. Most of them have names completely unsuitable for layman use, so special common names have been coined from that strange blend of letters and numerals beloved of the herbicide chemist. So, not surprisingly, one chemical may sometimes be known by more than one name.

Just as the variety of products available to the farmer is tremendous, so also is the variety of weeds to be controlled and crops to be treated, involving problems of recognition and identification. One must also be familiar with the correct dilution, the best time of application in relation to both crop and weed, consideration of possible long-term effects on crop or subsequent crops in the rotation, or injury to the neighbouring crops. Many other factors must also be taken into account.

THE DEVELOPMENT OF THE WEED CONTROL FIELD

This new science has been developing so fast that there are ample fresh research data available each twelve months to conduct a three-day conference, to hear the latest research and fresh developments in the use of weedkillers. The important point is that it must be recognized that this Conference is designed to attract people at a scientific level. The people who attend this Conference are responsible in the main for the dissemination of information to other persons, acting in an extension or advisory capacity to the man on the land to whom this knowledge is so vital.

The New Zealand farmer could be described as a man skilled in animal, crop and pasture husbandry, but with generally little basic knowledge of chemistry, although few can be as ill-informed as the mass of the public which appears to suspect all chemicals used in agriculture as undesirable and harmful. On the other extreme, there is this rapidly expanding new science, in which it is not easy for the technicians themselves to keep abreast of all the new developments, compared with the 85,000 New Zealand farmers to whom the whole process of selective weed control with growth-regulating substances and the like is, if not something unnatural, at least something very different from all the traditional husbandry practices.

It is therefore necessary to consider to what extent this complex subject has been presented in understandable terms and not insulated by its own technical jargon, and to see how effective the channels of communication or extension have been in ensuring that the requisite information is made available to the man on the land.

THE STUDENT

Perhaps education should be looked at first to see to what extent the rudiments of the subject are being taught to new entrants to agriculture who may be attending agricultural high schools or agricultural colleges. While it is reassuring to find there is reference to chemical weed control in the syllabus, the time devoted to it as a separate subject must be limited, and student experience in the practical application cannot be extensive. These young people have at least had some basic training in this science. They must have an advantage over the many established farmers who completed whatever form of technical training they had before the advent of these products, and in consequence have had to pick up their knowledge of the subject as they go along, and that largely from commercial sources and Government departments.

With students, as with farmers, the multiplicity of brand-names must cause confusion as they are taught to recognize a spray by the chemical name or symbol of its active ingredient, for example MCPA. When later they have to deal with these materials it is by their particular brand-names that they are bought and used.

THE FARMER

Consider the needs of the established farmer. It may be suggested that farmer representation at the New Zealand Weed Control Conference should be stronger. But let there be no mistake; nothing has been done in designing the programmes to encourage them to attend. This Conference is pitched at a research and technical level and the farmer is concerned only with the practical application of materials that are already in commercial production. There is, therefore, a gap to be bridged between this Conference and the final user. People look to officers of the Department of Agriculture and the commercial agricultural chemical organizations to carry out this all-important extension duty.

The majority of the larger commercial firms marketing chemicals have their own well-trained staff available to give advice to farmers; and it is known as a source of some concern to Government departments that farmers more often turn to the commercial advisers on this subject rather than to the somewhat more independent advisers of the Department of Agriculture.

Sometimes, however, the boundary between adviser and salesman is difficult to distinguish, and the salesman is frequently ill-equipped on the technical side. Information is needed to assist in the selection of the best product for use in specified circumstances. A major advisory problem is presented by the need to ensure its correct use to avoid unnecessary damage to neighbouring crops, and also, of course, injury to the people who apply the chemicals and those who finally consume the crop which has been sprayed. Much information is given in the instructions printed on the container or provided in a separate leaflet, but there is bound to be difficulty in putting over all the requisite information in sufficiently precise terms on a container label.

THE DISTRIBUTING AGENT (MERCHANT)

Between this Conference and the farmer is the merchant, who is a very important man in this particular field. The writer's view is that the merchant has a vital role in disseminating sufficient

knowledge to the man who does the actual work. Gone are the days when virtually only 2,4-D and MCPA were available to the farmer and they were used principally to control weeds which were highly susceptible. The farmer is now offered herbicides which enable him to overcome a great number of problems of varying complexity, problems requiring considerable precision and knowledge for the proper use of the chemicals concerned. Misuse, due to ignorance, can result in promising materials and techniques being quite wrongly considered a waste of money.

One notable "failure" in the district can off-set the good done by dozens of the unsung applications which did what was required of them. Nothing but harm can come from the giving of advice on the use of herbicides by anyone insufficiently briefed to do so. Also, a high degree of technical knowledge is almost useless unless related to the practice of application.

There is now a basic essential — the presence in a merchant's organization of at least one individual who is sufficiently well trained and practical enough to be capable of heading a special department dealing with herbicides, and at the same time probably fungicides and insecticides. Making all representatives highly technical in this field means that they have less time to obtain the broad agricultural knowledge necessary to function properly within the selling organization, which probably includes farm seeds, fertilizers and all other agricultural produce, and a hundred-and-one other things a merchant sells.

The writer's company believes that as many representatives as possible should be briefed to a point where they can understand the broad principles involved, assess the difficulty of a problem and, if necessary, refer it back immediately to the Chief Technical Officer or to one of the technical field representatives. To arrive at this stage they have probably availed themselves of the excellent technical courses, for which the manufacturer is greatly indebted to the major chemical manufacturers, to the Weed Control Conference or to the agricultural colleges. Apart from such courses and such conferences as these, the writer's technical knowledge, such as it is, has been gained through years of looking upon every field visit, or every weed problem, as an opportunity to gain more experience. It is believed that for this particular field one cannot get staff ready made and technically qualified. Neither a degree in agriculture nor a degree in chemistry is quite what is looked for, but one or other of these, together with experience, would be the ideal.

Having obtained a nucleus of knowledgeable representatives, the writer's company tries to increase their knowledge under its guidance in the field and to keep them up-to-date by frequent revisions, usually with the whole-hearted assistance of all. Many of the company's manufacturing associates work along similar lines. These methods help in fulfilling a role in the general basic education in the use of herbicides, but it is firmly believed that it is well-nigh impossible and probably undesirable to try to educate the majority of users to a high technical standard of knowledge of herbicides.

Farmers have to be advised, given some written form of advice and left with the hope that the spray operator does not mis-read what has been written. If it were practicable it should be made a rule never to offer advice or diagnose a problem over the telephone. This may sound obvious, but it is surprising how great the temptation to do so becomes in busy periods, when the problems appear straight-forward. Bitter experience has shown that rarely do things turn out to be exactly as described when they are seen in the field.

Before discussing the various techniques of extension available, it is desirable to summarize this important merchant phase in dis-

semination. Many merchants undertake this onerous task of staff education themselves. The company to which the writer belongs has shouldered this responsibility for its distributor chain. At regular intervals it runs training courses in basic and advanced categories to cater for the educational needs of those employed in the active sales force of the merchants. Before this system can be effective, however, time has had to be allowed for the merchants to assess the extent to which their company is prepared to become involved in the handling of herbicides, bearing in mind many factors, such as the potential existing in a trading area, the competition it is going to have to face, and the fact that it may cost him considerable expense and effort.

Having trained distributors' personnel, the company also undertakes to keep them posted regularly with technical developments. The company's own area technical field representatives keep close liaison with these men, particularly those who appear to be a bit over the average.

COMMERCIAL EXTENSION (TECHNICAL STAFF)

In a typical New Zealand agricultural chemical company, the technical staff at the home base may, in the case of a small company, consist of a few graduates each skilled in his own particular field — chemistry, physics, engineering, botany, etc. With large companies, the organization may be more elaborate and consist of a number of departments. Assume a company has a technical division handling technical service and a research and development division. The latter will be carrying out basic plant physiological and chemical work on herbicide problems, exploratory work on potential new herbicides, small- and large-scale screening, field evaluation and so on. For these purposes this department will be making contact with farmers primarily from the point of view of their unsolved or only partially solved herbicide problems, and to arrange areas where particular weed problems may be investigated.

There is an inherent failing with research and development personnel of a temptation to enter unwittingly into the field of advisory work, often with confusing and conflicting results. The technical service department, on the other hand, will be concerned primarily with taking new products from research and development, seeing them through their inevitable teething troubles when they get into the hands of farmers, referring the intractable problems back to research and development, and generally helping their commercial colleagues in the office and in the field to exceed their sales forecasts. In the early days of a new product, members of technical service sections will do a great deal of work going out into the field with representatives to visit and expound the new story to merchants and farmers alike.

As progress is made, the field representatives take over more of this work, coming back to the technical-sales department only when they get stuck and leaving that department to get on with the even newer products. Because of their spearhead activity, these technical servicemen are expected to know most of the answers to questions which arise from the customers' own particular problems. This calls for considerable experience and in many cases diplomacy, for the customer expects decisiveness, often on a question to which there is no immediate answer. No responsible commercial firm would dare make field recommendations that could not be justified by field results nine times out of ten, that is, if it wishes to stay in business.

THE PRINTED WORD

It is assumed that all are familiar with the printed word extension done by the Department of Agriculture and other Government

departments from the articles on weed control in the *N.Z. Journal of Agriculture*, bulletins on special problems, and the excellent handbook, *Chemical Methods of Weed Control* by L. J. Matthews.

Perhaps not so well known on a general scale is the mass of printed word undertaken by the commercial world. The manufacturer goes into print in at least five ways—labels, technical data sheets, leaflets and brochures, press articles and advertisements. From many points of view the labels are the most important. Legally, the label is certainly the only document that the user of a product can be assumed to have read, or, at least, to have had an opportunity of reading before the product is used. At the Denver meeting of the Weed Society of America, Dr. Ward, of the U.S.D.A., made the statement that the registered pesticide label is "the most expensive literature in the world". When one considers the cost involved today, particularly in the United States, to keep large research, development, and technical service departments going to obtain biological, toxicological and residual data, to satisfy approval and registration authorities, and to put up plants to make the products before one can draw the label, this statement seems correct.

WORD OF MOUTH

It is suggested that no other topic has been so widely talked about at Young Farmers, Federated Farmers, and individual farmer meetings and in occasional broadcasts as chemical weed control. During the winter months technical personnel and field representatives and Department of Agriculture personnel spend a quite significant amount of time in delivering lectures, giving farmer talks, and organizing schools of instruction, training courses, etc. In this particular field separate groups such as spray contractors, aerial operators and noxious weed inspectors are all catered for. Once the first difficult barriers of public speaking have been broken, most men can turn on a very reasonable lecture, giving advice and entertainment to farmer audiences. Personal experience shows that in any one season it is curious how quickly a pattern of questions emerges and continues throughout that season, enabling the lecturer to have the answers to many difficult questions readily available after the initial experiences. It has always been a matter of some concern to the writer's company that those who have to perform in public should perform well, and good public speaking is a very important part of the model extension worker. Unless the spoken word can be delivered in a good manner, it is just as well not to deliver an address at all.

It is here, very often, that the individual personality and speaking ability of a man can put him so far ahead of his competitors.

CONCLUSION

There are only 85,000 farmers in New Zealand, and with the quite large (numerically) force of extension and advisory workers it is felt that this is the most direct, most effective and most acceptable means of imparting knowledge to the farmer.