

EXTENSION TODAY AND TOMORROW

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This is one of the most important sessions of this Conference. Extension and education are vital to both the present and the future of our science, for without them all of the planning, research and development in the world are useless, since the results are not passed on to the end user.

The wide realization of the importance of extension and education to weed science has been shown by the very large number of papers presented through this section of the Conference, as well as by their range and diversity of origin. It has also been demonstrated by many of the speakers and discussions at this Conference.

Extension and education are largely synonymous activities and are the responsibility of all of us working in weed science - researchers and administrators no less than extension workers. Until the fruits of research are put into practice in the field (as against put into print) the work is unfinished and may as well never have been done.

Extension is a two-way process and a two-way responsibility. Like the quality of mercy, 'it blesses him that gives and him that takes'. Information must flow both ways between the researcher and the user; we heard only yesterday that although an estimated 20% of East Gippsland farmers have tried to control barley grass on their holdings in the last few years, the problem is largely unrecognized at official levels.

This section above all others allows us to examine our two theme questions -

Where have we got to? and

Where do we go from here?

A survey of the subject of extension and education in weed science discovers an area of such range and complexity that it is hard to coordinate all of the available material into a rational discussion. I think it would be best if we break it up into four main areas, each asking a basic question. These are:

1. Who needs the information?
2. How is the information put across to those who need it?
3. How are people to be trained for this function? and
4. What problems and gaps can we see in current and future extension and educational activities?

1. Who needs the information?

Of course, everyone needs information on weeds and on their impact on our society - every man, woman and child in Australia. We have a potential audience of thirteen and a half million, most of whom know little and care less about weeds at the moment. We must change all that!

Certain groups can be picked out, each with their own particular requirement for information:

Firstly, obviously, farmers and growers, both because weeds impinge most directly on their incomes and because they are in charge of most of the land upon which weeds grow. They are the major end users of weed control extension services on both of these counts. This group is usually eager for extension, and accepts it readily if it is effectively put over by responsible, trusted and identifiable people or groups. They also need an available troubleshooter to help with their problems as they arise and to give them confidence in the new techniques. Both extension officer and troubleshooter are usually one and the same man or woman - the industry rep. or the government adviser.

The rate of development of weeds on farmland, their effect on farm incomes, and the financial ability of the farmer to manage them economically (and therefore the receptivity of farmers to new methods) are at least partly controlled by annual fluctuations in input and commodity prices, as is shown in the paper on nodding thistle in the Southern Tablelands of New South Wales.

Whilst the farmer who owns and works his own land is readily identifiable as an extension target, the decision maker on the corporate farm may be more elusive. The farm manager is probably the best person to approach in this case. Whether owner or manager is the target, effective extension often depends on identifying the opinion leader - the one man in a farming community that others will follow. He may not be the innovator

in the community, since the true innovator may be regarded as a crank. The opinion leader may not be the best farmer in the district either, and since the actual opinion leader may vary from crop to crop within a district, he may be difficult to identify, filling a role of which he himself may be unaware. It is sometimes easier to get a group to innovate than an individual, on the principle that 'we're all in this situation together, and if we all try something new no-one will laugh at us if it fails'. Once the opinion leader has been convinced, other farmers will tend to follow the new line more or less rapidly according to their circumstances and the pressures put upon them by the weeds and other economic and sociological factors.

The farmer obtains his supplies of herbicides from retailers, and I feel that this important group has sometimes been neglected in extension campaigns other than those of the agrochemical industry. More effort should be made to extend to retailers the principles of integrated weed control and the potentially harmful long-term effects of reliance on herbicides alone. At present they are, as a body, pesticide oriented, and this is not in the best long-term interests of our science, the farmers or themselves. Mr Eady's paper discusses this problem. The better educated the retailers become, the better the advice that they will give to growers. The situation has been reached in the United States in which many retailers hold college or university degrees, and offer a level of in-depth advice that is unavailable in most areas of Australia. Training and retraining courses should be developed for retailers in all States; the CAEs appear to be the most suitable bodies to conduct them. At present, the retailers' best sources of information are likely to be the pesticide companies and the local agricultural advisory officer. The latter should call on all pesticide retailers in his area regularly to establish rapport, to learn of problems, and to help with their solution. The suggestion that the retailer will be pesticide oriented in his advice to farmers will not always be true, since such businesses are usually equipment agents and seedsmen as well; the development of integrated pest control attitudes through the retailer may be easier than it at first appears.

Weed control contractors form a third very important group to whom weed management extension should be directed. They are becoming increasingly important in both industrial (non-crop) and crop production as both pesticide and equipment costs escalate and the degree of sophistication needed to effectively

apply herbicides increases. It will be very interesting to examine the future growth of this section of the profession; its growth may well be a reflection not only of increasing costs and technological skill but also of the extent to which its members educate themselves vis-a-vis the farming and engineering community.

Weeds officers attached to local councils or to State Governments are a very potent force in weed control in our community. Their standard of training and the amount of extension, support and supervision that they receive varies widely from State to State, and I am positive that this is not in the best interests of weed management on a nationwide basis. These men are an integral part of their local communities, and so their attitudes as much as their knowledge have a profound effect on the attitudes of local landholders.

The training courses offered in some States and the correspondence course discussed in a paper in this section in support of weeds officers in New South Wales point the way for the rest of us to follow.

The public, I believe, need to be made much more aware of the impact of weeds on the economy of the nation, and also of the part that they themselves play in their spread and control. Of particular note is the role of horticulturalists and aquarists in the introduction of ornamental plants that later become serious weeds. Much can be done through schools, the papers, advertising on public transport, and particularly through radio and television to capture the interest of the public in these interesting, often beautiful, and highly important plants.

The importance of weed control in food production needs to be brought home more forcibly to the urban Australian, who also needs exposure to the concepts of vegetation management being practised in so many public areas such as parks, forests and roadsides. Perhaps no other presently uninvolved target requires so much extension effort from every one of us whose interests lie in weed control as does the Australian public, for although they control the public purse and the politician's vote, the bases of their opinions on this matter tend towards ignorance, apathy and emotion rather than knowledge, involvement and objectivity. It has become increasingly apparent that social pressures and implications are an important factor in all pest management programs, whether they be on private or public land or waterways.

Another very important target for weeds extension are the decision makers of the community. Politicians at all levels (local, State and federal) must be made aware of the potential impact and biology of weeds such as elodea and parthenium ragweed, both so that adequate funding can be assured and so that appropriate legislation may be quickly enacted. This is a real 'grass-roots' issue! Politicians must also be educated in the importance of pesticides in maintaining both our own standards of living and our export markets.

Educational administrators are an important group of decision makers, so far rather poorly served by weeds extension. If we can impress upon them the importance of weed science to our agriculture, livestock production, rural economics, planning, transport, health and recreation we shall be able to influence courses offered in many fields and at all levels, thus both increasing community awareness of our problems and increasing the supply of trained manpower into our profession.

It is very gratifying to find that although the number of delegates to this Conference is only two thirds that of the 1970 Hobart Conference, the number from educational establishments represented has risen from five to eight.

Other important groups to us in the extension field are National Parks officers and engineers responsible for the development of roads, water storages and industrial sites. Both face the public over weeds in areas of high visibility but with low maintenance cost structures; both rely more on vegetational management than on weed control as commonly practised on the land, and I think that we are able to help both groups in both understanding and overcoming their problems in the cheapest and most environmentally acceptable ways.

Two other most important groups of people have not so far been mentioned - the staff of Government Departments concerned with rural activities, and those of the agrochemical industry. It is needless to stress in this company that we ourselves should all be receiving continuous and intensive extension on the weed scene and on its short- and long-term implications for our own particular activities.

Extension in these two groups is probably easier than in most of the others already discussed - they have coherent and

disciplined organizations, they have a permanent relationship with each other and with their organizations, and they are amenable to high-cost sophisticated technology such as sales conferences and retraining sessions.

The need for us as professionals to extend knowledge and understanding of weed science and its problems and community implications to other educators and professionals in the arts as well as in the sciences has been brought out. Too often ill-informed comment from these community opinion leaders tends to increase misunderstanding and even to lead to restrictive legislation which does little to help the producer, the environment, or even the public.

2. How is the information put across?

Even a brief survey of the field of extension methodology shows that most available methods are already employed, though some of them much less than they could be. Extension is a bit like a rope - it stretches from me to you. It is composed of several mutually-supporting strands, and each strand is made up of a large number of interwoven fibres. The three main strands of the extension rope are personal contact, printed material, and broadcast material.

Personal contact is and will always be the most effective way of changing attitudes and passing on information, but it suffers from the three disadvantages of a limited audience, an ephemeral nature, and a lack of permanent record. Most of us find it to be the most stimulating and rewarding method of extension, whether in the farmer's field, at field days, film evenings, growers' or weed society meetings, or in the lecture hall.

Several of the papers presented in this section attest to the effectiveness of individual contact, provided it is properly used and supported by other methods. Its greatest advantage is that it allows immediate questioning and feedback, which in turn stimulate deeper and more meaningful discussion. Perhaps the most effective type of personal contact is the stimulation of self-help groups to deal with specific local weed problems, as discussed in two of the papers. Within our profession, talks and demonstrations at weed society meetings also form an important first stage in the wider extension process.

Printed material has generally been the most widely used and useful method of extension, since it can both reach a widely scattered audience and preserves a permanent record of the material presented. There are a great many ways in which weeds extension material is put across as printed material, a number of which are discussed in the papers presented in this session of the Conference.

Journals - including the extension and house magazines of the pesticide companies, the agricultural journals of the State Governments, and the several commercially produced farming magazines - offer up-to-date information on recent developments, both through their articles and advertisements. Together with the specialist journals such as the Australian Weeds Research Newsletter, Weed Science and Weed Research, they are the most important of all of the ways in which we put printed extension material across. The role of the daily newspapers in bringing weeds to the attention of the general public has not been well developed - and yet we have plenty of important and exciting situations.

A range of books cover the theory and principles of weed science (though we badly need an Australian textbook on this subject), while others cover identification and control. Speaking personally, I believe that information and recommendations on control should not be included in books on identification, because control systems are localized in their applicability, and even more because they are ephemeral in nature. Identification, on the other hand, is permanent information, applicable over a wide area. The danger is that out-of-date recommendations will be retained and used because they accompany correct identifications. Books need to be prepared at various levels to suit the needs of high schools, growers, technical personnel and research scientists. I believe that one of our greatest educational and extension needs is for a range of cheaply priced and low-key presentations on weed identification and on integrated weed control theory and recommendations, suitable for the end user.

The newsletters of the various State weed societies have an important role in recording and carrying the information presented at meetings to country members who are unable to attend meetings in capital cities and regional centres. I am happy to see that the quality and scope of these newsletters has increased in the last year or so.

Wallcharts provide a cheap and acceptable way of putting over a lot of tabulated or illustrative material, and the New South Wales Department of Agriculture and AVCA are to be congratulated on their joint production of wallcharts covering chemical weed control in a range of situations. Like so much of our extension literature, however, they are still too chemically oriented.

All of us will look with interest at the clip-card system being developed by Brian Hyde-Wyatt in Tasmania for weed seedling identification. If we were to single out one area of weed identification in most urgent need of attention it would surely be weed seedlings, including grasses.

Broadcast material reaches a huge section of the public, whether it be through television, magazine articles such as the very successful one on fireweed in northern New South Wales put over at peak viewing time after the Sunday evening news, or as morning radio talks to housewives. Both media have had a useful impact. There are also the more agriculturally orientated broadcasts, such as the recent one on parthenium ragweed in Queensland.

Farmers 'Talk-back' sessions are a potentially very valuable extension method, involving as they do both direct adviser/consumer interaction before a very wide audience and the personality that is lacking from so many other extension methods.

Apart from personal contact, the printed word and broadcasts, what other possibilities can we dream up? We must bring our imaginations into play and be prepared to spend some money on weeds extension to the general public. A set of stamps showing serious weeds of the world? Car stickers saying "Keep parthenium ragweed out of our area"? Stickers for children's school cases?

3. How are people to be trained for weeds extension?

Weeds are only one of three major (and several less important) groups of pests of primary production and urban life, and to train extension (or even research and development) officers in weed science to the exclusion of plant pathology, entomology, nematology, and vertebrate pest management is like putting a narrowly trained medical man into general practice. The man or woman who is trained in all branches of plant protection is a much more useful person in the field than the one who knows all about weeds but cannot tell a rootrot from a vascular wilt.

I make the plea, therefore, for broad training in plant protection for extension officers, whether it be formal or informal, of short- or long-term duration. Field experience has proved the broadly trained plant protectionist to be a more useful and valuable resource to the farmer than the specialist weed scientist, pathologist or entomologist.

Extension is one of the most basic functions of both government and industry, and extension officers come at all levels and with all sorts of backgrounds. Some are fortunate enough to have attended formal courses ranging from certificate to degree and even doctorate at colleges and universities. Most countries have found that the more highly trained and specialized (as opposed to experienced) an individual becomes beyond the basic degree, the less valuable he or she tends to be in the extension field. The degree graduate with a final year training in plant protection is ideal for the job of general practitioner in crop production, given some additional experience in the field. In a country with a small population (such as Australia) there will not be enough jobs for too many people specifically trained in plant protection to the highest levels. As more and more colleges and universities continue to jump on the plant protection bandwagon we shall end up in an oversupply position with increasing numbers of expensively trained young men and women unable to get appropriate jobs and careers.

On the other hand, there is and will always be a continuous need for retraining and updating of staff in both industry and government through short courses of a few days to a few weeks duration. Some of us here participated in the highly successful Camden school in 1973, and there has been a seemingly insatiable demand for places in the industry short course run each winter at the Queensland Agricultural College. The weed societies have an important part to play in this retraining field, through day and half-day courses and seminars on specific topics, more formal evening courses, and regular monthly meetings. The area includes the training programs offered by industry to their staff, as well as the many workshops, symposia, seminars and conferences organized at all levels, including our presence here today. Harry Combellack's and Bill Parson's papers ably summarize the role that weed societies can play in extension in Australia.

Correspondence courses offer a valuable method of extension to people in full-time employment or remote from centres at which more formal courses are available. New South Wales is to be congratulated on its development of such a course. I hope that it will be widely available outside that State.

4. What problems and gaps can we see in current and future extension and education activities?

Weed science is the most rapidly developing and exciting of all pest management areas, and there are tremendous developments and challenges ahead for us all. Unfortunately, because weeds are an old, chronic and recurrent problem, both the public and the farmer have tended to take them for granted until quite recently.

I suggest the following lamentable gaps exist in our extension armoury:

1. The changing attitude from short-term knockdown weed control to longer-term dynamic management of weed populations is going to influence our thinking and decision-making over the next decade.
2. We must play down the presently predominant role of herbicides in weed control and play up the roles of exclusion, good management and physical and biological methods in the development of integrated weed management systems.
3. Research and training in the assessment and interpretation of economic injury levels are very badly needed by the extension officer, since the first questions he is often asked are - "How much will the weeds cost me?" and "How much benefit will I obtain from their control?"
4. Weed science needs to become more integrated into a broader crop protection concept, as I have already stressed.
5. We need more printed material on weed identification at all stages of plant growth, especially as seedlings (including grass seedlings).
6. We need an Australian textbook on weed science at tertiary level before the next Australian Weeds Conference.

7. We need a new Australia-wide popular/technical journal on weed science and weed management, aimed at industrial and government personnel, farmers and growers, retailers, educators, decision-makers, students and the general public.

8. We need to improve our image in the public eye, and to educate them in the necessity for integrated weed management by whatever methods are most cost effective and environmentally desirable. The employment of journalists and public relations consultants is perhaps the best way of achieving this end.