WEED CONTROL IN ENGLAND

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I should emphasise at the outset that during my visit to England, Denmark and Holland, I had very little opportunity of observing actual weed-spraying practice—it was late winter and early spring when I was there and, in addition, most of my time on farms was spent discussing nitrogenous fertilisers.

However, I did gain a considerable amount of information from these and other sources and, I think, a fair picture of weed control in England.

The most important weedspraying problem by far is the selective control of weeds in cereal crops. England grows several million acres of cereals and for a long time has searched for a really good method for controlling weeds. It is, therefore, very obvious why English manufacturers were primarily interested in the selective aspect of weedicides, and this is one major reason—though not the only one—why they concentrated on M.C.P. as the chemical of choice for this purpose.

M.C.P. was first released as a commercial product in 1940 and it is still the main weedkiller used for this purpose (12 years later). I believe amine 2,4-D is also being used. The general picture is more or less the same as here—"hormones" are not the sole answer to weed problems but they do represent a tremendous step forward.

Considerable attention is now being diverted to esters of M.C.P. (as distinct from 2,4-D esters) as they are generally more lethal to weeds than the water soluble sodium salt but are less damaging to crops than 2,4-D esters.

Another major problem is the control of weeds in sugar-beet crops. A very wide range of chemicals and techniques are under investigation, but as yet no clear-cut answer has been found.

For weed control in peas the newer dinitro derivatives (DNBP) are being used very extensively; but, because of the toxicity problem and the limited conditions under which these are really effective, alternative materials are being sought. M.C.P. is being used as a dust—never as a spray—but this is by no means the complete answer.

Little is being done with 2,4,5-T—possibly because the gorse and blackberry problem is not so acute as it is here. Probably this is due not only to the climate but also to the intensity of farming and greater availability of farm labour to tackle these weeds by hand. I was not able, therefore, to get into many arguments about the pro and cons of 2,4-D/2,4,5-T mixtures, or winter spraying of gorse, etc. However, there was a considerable interest in New Zealand experiences over the last few years with 2,4,5-T.

From the practical side there appears to be a fairly wide range of spraying machinery available—and, of course, low volume spraying is standard practice. Most of the machinery is fairly high in price and appears to be unnecessarily elaborate. One well-known contracting firm has a very impressive range of equipment and is setting good standards in application technique and in protecting operators from risks. Many private contractors are functioning, but the prices I heard were rather high by our standards. It may be of interest to know that in Holland and Denmark very successful contractor services have been built up under the co-operatives scheme.

Most of the experimental and research work is conducted by commercial organisations—usually companies with extensive overseas markets to justify the expense involved. The main official organisation is the Herbicidal Unit under Professor Blackman at Oxford—there are, I believe, about 15 workers in that unit and they are doing excellent work.

The pattern of this commercial research is the usual one—screening tests of hundreds of chemicals—small plot trials with the promising few—followed by extensive co-operative farm scale trials working in conjunction with the National Agricultural Advisory Service Officers. At the same time, independent lines of research are followed. It appears unlikely that a new development equivalent in scope to "hormone" weedkillers is imminent, but they have opened up a completely new field for investigation.

One must concede that British research is somewhat conservative—and a little appalled by the current flood of new chemicals and claims. However, as in other fields, the final results are usually sound.

Needless to say, the same story exists with conflicting and confusing experimental results, and they readily concede that many aspects of the effects of "hormones" are yet unexplained. And the same argument continues—whether to experiment with commercial formulations or with the pure chemicals in standard formulation.

I might quote a prominent research man—

"There is, however, evidently a very complex relationship between stage of growth, and perhaps many other factors, and the susceptibility of any weed or crop to any particular weedkiller.

It is now generally agreed that for 2,4-D the esters are more phytotoxic than the amines and these again than the sodium salt or straight acid. Such comparisons, however, immediately raise the question of the formulation of the active compounds. Esters are not water soluble and so what is the effect of the oil, emulsifying agent or other adjuvant included in the spray liquid? Many comparisons have been made between different esters without common adjuvants and conclusions drawn which may well be quite erroneous. Manufacturers cannot be expected to disclose publicly details of formulations which have been costly to produce. This generates great difficulties for official investigators or product-approving authorities who, whilst able to say that a particular proprietary product contains a specified active principle, have no knowledge of other components which may very markedly influence the efficiency of the product. The pure scientist will say that trials should be conducted with pure chemicals only but such experiments are of much less value to the user than those with recognised commercial products which are available on the market. Economic use of a pest control chemical is often possible with an impure commercial preparation when cost would prohibit the employment of the pure active ingredient."

But the scientist has a sound answer to that—that if truly valid comparisons are to be established between the various derivatives of M.C.P. and 2,4-D—or 2,4,5-T—then the comparisons must be based on pure samples formulated in a standard way with standard emulsifiers, wetting agents and solvents. These detailed comparisons are difficult and complex, but such basic work, supported by practical field evidence, is the only way to determine the most efficient formulations.

A fairly wide range of the usual chemicals are being tested out—basic chemicals such as TCA, IPC, 2,4-D, P.C.P. and sodium P.C.P., DNOC and numerous derivatives of these. Naturally, the new CMU has caused about as much interest as the now well-known krillium. Most of these new materials appear to be more specific and have some limitations, and will probably demand from the user a great understanding of application technique.

Before closing I would like to refer to some general topics that may be of interest.

Recently the combined application of soluble weedicides, together with soluble nitrogen and phosphates, was undertaken by aerial contractors on rather poor rushy marshes in England. It is too early to evaluate the results but the method has caused considerable interest. If the manurial and weedkilling effects are worthwhile and economic, the method might be of some value under New Zealand conditions.

Considerable attention has been focussed in England to the toxic hazards of the newer agricultural chemicals—weedicides, insecticides and fungicides. An authoritative working party was established to investigate the whole range of chemicals in detail. Recommendations and precautions to ensure safe operation by contractors or ordinary users were then drawn up. In view of the highly toxic nature of some of these chemicals, this step was very necessary and has been welcomed by most of those involved in handling them.

Occasionally vague reference has been made to the possibility of weeds developing resistance or strains resistant to a particular weedicide. Apparently there is as yet no evidence in England of such resistance developing and it is felt that the use of alternate weedicides each season, rather than a mixture, would be the solution if the situation did arise.

One point we have always been interested in is the difference in rates recommended for similar chemicals in England and the Continent, as compared with America. I gathered there may be two reasons for this—both mainly psychological rather than chemical. Firstly, the British usually recommend the maximum rate necessary to ensure control and thus allow a wide safety margin. Secondly, it appears that the American and Canadian farmers are prepared to accept a **reduction** (say 70 per cent.) in weeds rather than the 100 per cent. control required by the English—and New Zealand—farmers. An economic balance is struck between the cost of the treatment and the degree of weed control that is required. The differences are not in any way attributable to any climatic or biological differences.

In conclusion, I might say I was impressed by the considerable amount of experimental work going on in England—and I think they were quite impressed by the information contained in the Proceedings of our own National Weed Conferences.

DISCUSSION

Q. Mr. Gordon mentioned that the cost generally in England appeared to be higher than the cost in New Zealand. I would like to know whether that differential was caused by a higher cost in chemical or higher cost in actual application rate.

A. I quoted a figure of £9 per acre for selective weed control in cereal crops. It is not the cost of chemical but more or less a question of what the market would stand.

Q. In the United Kingdom do they have any trouble with spraying crops next to susceptible crops?

A. I did not get any information on that. The question was not raised in any of the discussions, nor was the question of damage or legal difficulties.

Q. Have you any information regarding the sterility of stock grazed on hormone pastures for any length of time?

A. In England that question had been investigated closely without finding any deleterious effects.

Q. In England there is extensive use of D.N.B.P. Was there any occurrence of bee poisoning?

A. There was no evidence of bee poisoning. There was a close control kept on all aspects of its use.