RECENT OVERSEAS DEVELOPMENTS IN WEED CONTROL

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GREAT BRITAIN - A good deal of work has been devoted to trying to increase the herbicidal effects of I.P.C. (isopropylphenylcarbamate) which is chiefly effective against grasses. Unfortunately this work has not met with any success.

Reports about I.P.C. were very conflicting but Swedish workers are enthusiastic about it, especially for the control of wild oats in non graminaceous crops.

Ester formulations of 2,4-D were not popular in England, Agroxone and the amine salts of 2,4-D receiving most attention. Much interest was apparent in the improved dinitro compounds, especially dinitro secondary butylphenol (now available as Sinox W). This preparation is much easier to use than ordinary Sinox as it is a liquid and consequently there is no difficulty in getting a solution of known strength. Dinitrobutylphenol has a somewhat different selectivity than dinitroorthocresol and is particularly useful with pea crops, as the new product does not damage peas as much as its predecessor. The dangers associated with prolonged exposure to and contact with dinitro compounds is being stressed in the United Kingdom following fatalities amongst spray operators.

NORTH AMERICA - Although much more developmental work is being carried out in U.S.A. than in Britain, the situation regarding various weedkillers is very confused indeed. Eastern workers consider, almost unanimously, that I.P.C. has no place in control of grassy weeds but T.C.A. is very promising. On the other hand, Californian and Oregon investigators consider that I.P.C. is a most valuable material, and deplore the fact that they cannot get adequate supplies. They likewise consider that T.C.A. is unlikely to prove satisfactory under their conditions, even if the price difficulty can be overcome.

In the Eastern States the main problem is that of brush control. It is astounding how quickly cleared land can become re-wooded, and with what a variety of species the land becomes covered. In general we have only one species to contend with at one time, consequently we should not place too much reliance on Eastern American recommendations which generally advocate the use of 2,4-D - 2,4,5 T mixtures, but this is primarily to affect as many species as possible at one time. There has been a good deal of loose talk to the effect that such mixtures give a much greater kill than equivalent amounts of either separately. This alleged synergism may be a good selling point but it has not convinced unbiased research workers who have pointed out that 2,4-D and 2,4,5 T are too closely related chemically to be likely to show any pronounced synergism. One reason why mixtures of 2,4-D and 2,4,5 T have been put out is that an "apparently" cheaper preparation can be marketed (as 2,4-D is much cheaper than 2,4,5 T) but it is very doubtful if such a mixture is as cheap on a percentage kill basis as the straight chemicals. This appears to apply in Oregon and Northern California, where 2,4,5 T has given very satisfactory control of blackberry (under certain conditions), whereas the substitution of some of the 2,4,5 T by 2,4-D has resulted in much inferior killing. The conditions for a good kill of blackberry are that all top growth must be wetted and that the plants must be in active growth when the 2,4,5 T spray is applied. It must be stressed that any strictures on 2,4-D - 2,4,5 T mixtures do not necessarily apply where a number of species are involved. In general, American experience appears to be that if a species can be controlled adequately by 2,4-D alone, then it is not economical to add 2,4,5 T to the spray and that where 2,4,5 T is more effective than 2,4-D then there is no point in adding 2,4-D to the spray mixture.

GRASSY WEEDS - The first chemical showing any marked success against

grasses was the isopropylphenylcarbamate developed in England. While this chemical has not lived up to expectations, it is very highly thought of in Oregon and California where it is used for eliminating grasses from lucerne and clover stands (especially for seed production). I.P.C. is used dissolved in an aromatic oil, or as a wettable powder. Besides being effective against grasses, it is also useful against chickweed when the plants are small. Some quite promising results have been obtained in the control of seedling grass weeds amongst established grass. I.P.C. is being used in Michigan and Oregon for control of chickweed in strawberries. At the rate of 5 - 20 lbs per acre disced into the soil it is useful for control of quack grass (couch) and Oregon workers consider it much superior to T.C.A. (trichloroacetic acid or salts).

In the Eastern United States T.C.A. (sodium salt) was considered outstanding for the control of couch when sprayed on to the cultivated soil, before the soil becomes dry, at rates of 20 lbs per acre upwards. However, in New Jersey and New York States it was considered that 60, 80 or even 100 lbs per acre are necessary, which is costly. Also T.C.A. is very corrosive to equipment. Californian and Oregon workers dismissed T.C.A. as being unsatisfactory apart from cost.

A new Californian development is the discovery that Maleic hydrazide is very effective for control of grass in cotton crops. It is still much too early to know what the cost of this chemical will be or whether its early promise will be sustained. An organic chlorine nitrogenous compound for the control of grassy weeds has now been released for experimental work but its composition has not yet been disclosed.

SPECIAL PURPOSE HORMONE SPRAYS - In the Eastern States chemicals especially suited to each particular crop are likely to be developed. An instance of this was observed at Seabrook Farms where Carbide and Carbon Chemicals had successfully applied a new derivative of 2,4-D for the control of fathen and amaranthus in various vegetable crops. This material was especially good for spinach and beans, both of which are severely damaged by 2,4-D. This chemical, which is 2,4 dichloro-phenoxy-cellosol sulphate is being marketed under the name EH1 and is used as a pre-emergence treatment.

MISCELLANEOUS - (1) University of Manitoba were carrying out intensive work on spraying equipment especially on nozzles. Of the very many nozzles for low-volume spraying, only two have given satisfactory coverage. One of these is American costing about \$1.50 and the other a British ceramic jet, originally developed for gas burners, and which costs about three pence.

(2) In California a cheap white titanium pigment was being incorporated into the spray as a marker to indicate sprayed areas and also to show how effective the coverage is.

(3) **Research:** A few Universities were carrying out physiological work with the object of deciding just how the various types of weed killers act on the plant. While one of the most spectacular changes produced by the hormone-type herbicides is the effect on the carbohydrate constituents it is generally agreed that the early theory, that the treated plants died of starvation due to the drain on sugars and starches, is not adequate to explain the changes which take place. Profound changes take place in many normal constituents of the plant. English work shows quite conclusively that the stems and leaves of treated susceptible plants are almost completely depleted of potash and that this potash is transferred to the roots. Potash is known to be concerned with the metabolism of carbohydrates and it may well be that the disturbances in carbohydrates are associated with the disturbance in the potash content. Radioactive tracers are being used in a number of places and interesting results have been obtained so far as translocation of active substances are concerned.

QUESTIONS AND DISCUSSION

MR. JOHNSTON said he understood that there had been considerable work in Britain by commercial interests in the way of spraying wheat, barley, pea and potato crops, even by using helicopters. What was the general impression of the success of such ventures?

DR. DOAK: The general impression is that it is very successful. One of their troubles is charlock and it is easily killed in this way. They have big contracting organisations. They are still using sulphuric acid in a fairly large way as well as 2,4-D compounds.

PROFESSOR CALDER: I saw a 2000-acre farm in Norfolk where the whole of the 2000 acres was sprayed some twice or three times a year at an average cost of £3 to £4 an acre. The farmer is not spending that money if it does not pay him. There is a terrific increase in the spraying of arable crops throughout England.

MR. MADDEN (Grasslands Division): The Aerial Work Operators' Association in Wellington last week discussed the danger of drift of sprays, and they are well aware of that danger.

Answering a question as to whether in the United States he had seen the work of 2,4-D or 2,4,5 T on gorse, DR. DOAK said that in the States gorse was only a problem in Oregon and Northern California. In Oregon the impression he got was that they were far from getting a reasonable control of gorse. They still recommended the use of goats.

Asked about reported fatalities in Britain from exposure to dinitro compounds, DR. DOAK said: There have been two or three fatalities among operators, and there have been a few very seriously ill. There is quite a controversy on regarding it. Some people recently suggested that there had been too much made of it, and that the fatalities were the result of carelessness.

MR. WARREN (Federated Farmers): Were the deaths not due to excessive heat? At the inquest in England it was suggested that the spray should not be used at above certain temperatures.

DR. DOAK: That has been mentioned, but my impression was that it was due to continued exposure. Their clothes had been impregnated and there had been a lot of absorption through the skin as well as what might have been breathed in.

MR. IVERSEN: We have been using DNOC with low pressure, low volume, but in England I understand it is used at high pressure, high volume.

DR. DOAK: Against that you are using a higher concentration solution. It may be a case of familiarity breeding contempt, so perhaps there is no danger at all. They can rig up air-tight compartments so that all incoming air comes through carbon respirators and is filtered, or gas masks can be used.

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