THE CONTROL OF WEEDS IN BRASSICA CROPS

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THE dependence of our dairying and sheep farming systems on successful cropping needs no elaboration. I believe that we are discussing weed control in brassica crops here today for four main reasons.

1. Cropping is by no means a new concept and many paddocks being ploughed today were sown to grass many years ago because the weeds could no longer be controlled. Weed seeds have survived these years.

2. With the increase in the price of grass seed the tendency is to take several crops before regrassing. Even with cultivation to South Island standards this means more weed.

3. In the past two seasons the low rainfall of late spring months has favoured weed growth and prevented normal growth of crops.

4. Weeds have increased in spite of our efforts even when aided by present mechanical methods of cultivation.

Before continuing I would like to emphasise that this paper is based largely on work done by F. Thompson, Agricultural Chemist, Rukuhia Soil Research Station, and instructors of the Extension Division, Department of Agriculture.

The importance of weed control in brassica crops can be judged from the fact that in my district alone 5 to 6 paddocks, mainly soft turnips, were completely smothered, while an equal number yielded 15 to 18 tons instead of 30 tons which was the average of most crops. Although chou moellier was smothered only once, in many paddocks yields were greatly reduced. I have been given to understand that because of weather conditions the position was the same for most crops between here and Auckland.

GOOD CULTIVATION

Where land is being developed from scrub time is not an important factor. After winter fallowing a seed-bed should be worked up as soon as possible so that at least two combined discing and harrowings are possible where necessary prior to sowing. Where crop is following grass the time factor becomes important particularly in respect to the weed problem. If the season tends to be very dry and weeds are known to be a serious problem, no special cultivation treatment will give complete control and reliance must be placed on pre-emergence weed control. When the season is favourable and weed infestation is thought not to be severe early ploughing turning the furrow flat, allowing time for the turf to break down, and working rapidly to a seed-bed so as to allow at least one harrowing for weed control purposes before sowing are most desirable. Particularly where *paspalum* is present a single cut with the rotary

hoe before ploughing will save up to a fortnight in seed-bed preparation, allowing more time for weed control cultivation. Some of the weeds that cause the most damage do not germinate until weather conditions are warmer than required by the crop. Early cultivation, sowing a slower maturing crop could avoid what 3 weeks later would be a serious weed problem. The crop would still be available when required.

METHOD OF SOWING

More especially in a dry spring drilling will mean slightly more even and perhaps slightly quicker germination and growth, two major factors in weed suppression. One factor I think we would all like to know more about is the extent to which crop yields can be increased by hand thinning and weeding. Where labour is available hand weeding to save what would be a good crop in a poor season definitely pays. Drilling in 14in. rows makes this task much easier. When the crop is drilled on the flat, inter-row mechanical cultivation with fixed tine cultivators seldom succeeds because of tendency to bury the crop seedling. This is definitely so in a dryish season with a fibrous rooted weed like amaranthus. Unfortunately hand weeding and thinning are seldom done at the early seedling stage and stunting of the crop results from weed competition. I do believe that if cropping becomes still more popular, satisfactory methods of thinning and inter-row cultivation would be developed. The smaller farmer should know that an acre a day with a junior type of inter-row cultivator is not hard work and certainly cheaper than some methods of chemical weed control.

CHEMICAL WEED CONTROL

Unfortunately brassicas are very susceptible to hormones of the 2,4-D, MCP, and 2,4,5,-T class. This has led to the investigation of pre-emergence weed control. Actually kerosene at 20 to 40 gallons per acre has been used for this purpose for many years. In recent years trials have been conducted with more selective materials and this conference is an appropriate occasion to review this work.

The tolerance of most field brassicas to pre-emergence weed control treatments appears to be the same from a practical aspect. If anything swedes may be slightly more resistant than other crops to treatments applied so far. Quite definitely crops drilled at a constant depth are slightly less susceptible than those broadcast. I propose to deal with each material which has been used for weed control separately.

2,4-D PREPARATIONS

Earliest trials conducted all gave substantial injury to the crop such that further work was unwarranted.

CIPC

The two trials conducted with rape and swedes indicated that even at light rates of $\frac{1}{2}$ to 1lb. carbamate equivalent per acre on drilled crops germination and growth suppression occurred rendering this weedkiller unsuitable for weed control among brassicas, particularly in lighter soils in northern areas of New Zealand.

DALAPON

In the one trial conducted where Dalapon was applied at rates of up to 16lb. per acre to swedes 3in. to 4in. high and spurrey up to 4in. high, slight but unsatisfactory suppression of the weed was obtained. It is

possible that Dalapon applied when spurrey is at the seedling stage may prove effective, but it is obvious that more experiments must be conducted.

IPC

Results of trials with IPC have been much more encouraging. Even when no rain fell until the spurrey was well advanced IPC at 4lb. carbamate equivalent level proved effective. At a 1 to 2lb. level, spurrey growth was retarded. Neither the germination nor the subsequent growth of swedes or rape was affected by IPC at the 4lb. carbamate equivalent level. It would appear that IPC sprayed at 2 to 4lb. carbamate equivalent per acre about 3 days after the crop is sown is an effective measure of weed control irrespective of dry weather conditions.

TCA

Numerous trials have been conducted with TCA and conclusions can be drawn. The crop should be sown on recently harrowed ground and TCA applied immediately after sowing. When possible the TCA at 20 to 30lb. per acre should be applied to moist ground or its application followed by showery weather. Under such conditions TCA has given good control of spurrey, amaranthus, fat-hen, and *Polygonum* species. When applied at seeding or during hot, dry weather, TCA has usually been ineffective. If such weather conditions prevail IPC would seem to be more reliable.

OKTONE

In trial work this material has shown promise, but spraying must be carefully timed and the crop must be drilled. The paddock should be worked to a seed-bed and the weed seedlings allowed to germinate. The crop is then drilled and approximately 24 hours before the crop germinates the weed seedlings, now up to 2in. in height, are sprayed with 1 to 1½ gallons of Oktone in 12 to 20 gallons of dieselene. Fat-hen and spurrey seedlings are destroyed and the growth of tougher weeds like docks retarded. Although the growth rate of the crop may be slightly checked, at maturity no difference could be noted.