

SELECTIVE CONTROL OF ANNUAL WEEDS IN SUMMER GRAIN CROPS

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In Queensland the most important summer grain crops are Sorghum and maize. Weeds can be troublesome in both crops and selective herbicides offer a method of control for some of them.

There are three chief difficulties in using 2,4-D and M.C.P.A. to control annual weeds in summer crops. These are:-

1. Maize and sorghum are more susceptible to these herbicides than winter cereals such as wheat, oats and barley.
2. Many of the summer weeds are less susceptible to hormone weedicides than the common weeds of winter crops.
3. Grassy weeds are a feature of the summer season and these are not susceptible to 2,4-D or M.C.P.A.

It is obvious, therefore, that generally there is less margin between crop tolerance and weed susceptibility in summer grains than in winter cereals. In maize it is not usually safe to apply more than $\frac{3}{4}$ lb. acid equivalent per acre of M.C.P.A. or 2,4-D sodium or amine salts and in grain Sorghum the safe level is usually nearer $\frac{1}{2}$ lb.

In the maize areas of the Atherton Tableland the worst weeds are star burr (Acanthospermum hispidum), Apple-of-Peru (Nicandra physaloides), locally known as wild hop, Mossman River grass or Mossman burr (Cenchrus echinatus) and stinking roger (Tagetes minuta). Star burr and Mossman burr grow between the rows and are troublesome at picking time. Apple-of-Peru and stinking roger germinate after the corn is out of hand and grow so rapidly that they overtop the maize plants before the crop is mature. In the more southerly maize areas the chief weeds are bell vine (Ipomoea plebeia) and morning glory (Ipomoea purpurea), Noogoora burr (Xanthium pungens), Bathurst burr (Xanthium spinosum) and summer grass (Digitaria adscendens). Ipomoea are particularly troublesome since they germinate at the same time as the maize and twine over the growing plants.

In grain Sorghum the principal annual weeds are mintweed (Salvia reflexa) and thornapples (Datura ferox and D. stramonium). Mintweed germinates in great abundance after spring rains and if it is not controlled can compete seriously with the growing crop. Thornapples behave in the same way. The seeds are toxic and their presence in Sorghum grain is prohibited.

Star burr, bell vine, morning glory, Noogoora burr and Bathurst burr can all be killed fairly readily with $\frac{1}{2}$ lb. acid equivalent of M.C.P.A. or 2,4-D per acre, provided the plants are in vigorous growth. In cultivated land they generally are in such a condition at the time when spraying is desirable. Their control with these chemicals thus presents no special problem.

Mintweed can be killed with 2,4-D or M.C.P.A. at 2 lb. acid equivalent per acre. Even in the young stages 1 lb. per acre is needed for a complete kill. This rate of application cannot be used safely in grain Sorghum so that complete kill of the weed in a growing crop is not a practical proposition. It has been found, however, that these chemicals will retard the growth of mintweed and prevent the production of ripe seeds if applied at the rate of $\frac{1}{2}$ lb. per acre when the weed is young and growing rapidly. The mintweed is not killed outright but its growth is retarded sufficiently to allow the sorghum crop to develop without serious competition.

Thornapples are fairly resistant to 2,4-D. If the plants have grown without check and are in vigorous, sappy condition it is possible to kill them with 2 lb. acid equivalent per acre of 2,4-D or mixed 2,4-D and 2,4,5-T. Experiments this year indicate that if the plants are young and growing rapidly, $\frac{1}{2}$ lb. per acre of either of these chemicals can cause distortion and stunting of the plants and the production of abnormal capsules which contain no viable seeds. D. stramonium is occasionally killed outright. Earlier work indicated that D. ferox in particular was resistant to these chemicals and further work is needed to determine whether these results can be repeated.

The grassy weeds in summer crops, principally maize, cannot be controlled by post-emergence application of hormone herbicides but pre-emergence application of 2,4-D is giving promising results in some districts. So far, there has been no general application of this technique in the maize-growing districts.

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