

3 lb a.i. per acre after emergence.

No treatment, whether prior to sowing, before emergence or after emergence, caused any reductions in rice plant numbers. Variations in crop tiller numbers, dry matter production, and yield reflected weed control efficiency.

The results of these trials indicate that molinate is a versatile herbicide which can be used safely and effectively over a wide range of application times. Its safety as a pre-sowing or pre-emergence application contradicts some overseas reports and local glasshouse results. Safety in the current experiments was exhibited at rates twice those normally used.

Molinate is generally considered to have a soil life of at least 3 weeks. In a cool spring, rice grows slowly and 5-6 weeks may elapse before the crop is far enough advanced to tolerate permanent flooding. Under these conditions the residual effect of molinate applied before emergence may dissipate before anaerobic conditions prevent further *Echinochloa* germination. This may account for the slight superiority of post-emergence applications.

Distribution of *Echinochloa* in rice bays is often far from uniform, varying from dense stands to practically weed-free conditions within a few yards. If spraying can be delayed until the extent of the infestation can be seen, it is often possible to restrict treatment to part of the crop only.

For this reason, and from the results outlined above, there would seem to be no reason for altering current recommendations to apply 3 lb a.i. per acre at the early post-emergence stage. If, however, earlier or later application becomes necessary for some reason, the time of application can be varied without any great reduction in weed control efficiency.

#### THE ROLE OF POST-EMERGENCE HERBICIDES FOR WEED CONTROL IN COTTON IN QUEENSLAND

W.H.L. Hazard  
Department of Primary Industries, Queensland

#### INTRODUCTION

The present use of herbicides in cotton in Queensland is almost entirely limited to pre-emergence materials. An estimated 75% of the irrigated cotton acreage is treated annually. Post-emergence herbicides are not widely used.

## LIMITED USE OF POST-EMERGENCE HERBICIDES

The reasons for the limited use of post-emergence properties in cotton include:

- (1) A lack of awareness among growers of the particular properties of the post-emergence herbicides.
- (2) The wide usage of pre-emergence herbicides. Many growers are reluctant to use a post-emergence herbicide after already having used a pre-emergence one.
- (3) Growers experiencing poor results in their initial attempts at post-emergence weed control. This can usually be traced to (a) inadequate equipment, particularly when a directed spray is required; (the problem is accentuated by bed construction that is unsuitable for current post-emergence spray rigs), (b) failure to use a non-ionic surfactant with those herbicides for which it is essential, and (c) spraying when weeds are too far advanced.

The only herbicide being used commercially in a post-emergence role in cotton in Queensland at present are DSMA and diuron. Prometryne and fluometuron are registered for use in cotton but have found little commercial application in a post-emergence capacity. MSMA and norea have been tested under Queensland conditions both separately and in combination. At the time of writing (June 1970) these preparations were not registered in Queensland for use as post-emergence herbicides in cotton.

## USE AND LIMITATIONS OF PRE-EMERGENCE HERBICIDES

The most widely used pre-emergence herbicide is trifluralin: prometryne, diuron, and fluometuron are used to a smaller extent. These herbicides are capable of controlling a wide range of weeds but many weeds are not controlled. For example, trifluralin is not effective against mintweed (*Salvia reflexa*), common thornapple (*Datura stramonium*), Noogoora burr (*Xanthium pungens*), Bathurst burr (*Xanthium spinosum*), anoda weed (*Anoda cristata*), bell-vine (*Ipomoea plebeia*), malvastrum (*Malvastrum spicatum*), prickly paddy melon (*Cucumis myriocarpus*), Johnson grass (*Sorghum halepense*) from rhizomes, or nut-grass (*Cyperus rotundus*). Any of these weeds, if not controlled, can become a serious problem in cotton crops in certain areas of Queensland.

## ROLE OF POST-EMERGENCE HERBICIDES

It is unlikely that a chemical weed control programme in cotton will be based on one of the post-emergence herbicides. It is

more likely for them to have a complementary role, being used, if and when required, to control those weeds not controlled by the selected pre-emergence herbicides. The organic arsenicals, DSMA and MSMA, are almost ideally suited to complement trifluralin. MSMA in particular is capable of controlling the majority of weeds not controlled by trifluralin. Experiments over the last two seasons have established the tolerance of cotton to MSMA under Queensland conditions both as an overall and as a directed spray at various stages of growth. It has been shown that this chemical can be applied as an overall spray at 2 lb a.i. per acre (2.24 kg per hectare) as early as the cotton 3 in. (7.62 cm) stage without a reduction in cotton yield. This feature leaves the way open for possible aerial application.

It is believed that the continued use of the current range of pre-emergence herbicides will tend to increase the problem caused by tolerant weed species. In terms of species controlled, ease and choice of application, low cost, and the reduced soil residue build-up, post-emergence herbicides such as the organic arsenicals offer an effective means of complementing the current pre-emergence herbicides in Queensland.

WEEDS IN SOYBEANS UNDER IRRIGATION IN NEWLY CULTIVATED  
LAND AT CAMDEN, NEW SOUTH WALES

P.W. Michael  
University of Sydney, New South Wales

The following weeds were encountered in growing soybeans under spray irrigation at Camden, New South Wales in 1969-70: *Amaranthus hybridus* and *A. powellii*, *Chenopodium album* and *C. pumilio*, *Datura stramonium*, *Digitaria sanguinalis*, *Echinochloa crus-galli*, *E. colonum*, and *E. crus-pavonis*, *Eleusine indica*, *Eragrostis* spp., *Panicum capillare*, *Portulaca oleracea*, *Solanum nigrum*, and *Sonchus oleraceus*. None of these occurred in great numbers but they include a number of the more important weeds of summer crops in other parts of New South Wales suitable for soybean growing.

In an experiment designed to test the tolerance of soybeans (variety Lee) to chloramben and trifluralin, two of the most widely used herbicides in the crop in U.S.A., information on the susceptibility of some of the weeds listed above was obtained. Chloramben at 3 lb per acre (3.4 kg per hectare) applied immediately after sowing and trifluralin at 1 lb per acre