THE USE OF ADJUVANTS WITH ATRAZINE IN MAIZE

P.W. Weiss and D. Oliver
Geigy (Australia) Pty Ltd,

The control of *Echinochloa crus-galli* is of major importance in maize, particularly under irrigation. It was found in 1961 that, while atrazine was satisfactory for this purpose as a pre-emergence treatment, poorer control was obtained in a post-emergence application. The methylthio-triazines, ametryne and prometryne, achieved satisfactory post-emergence control but were too phytotoxic to the maize.

Subsequent field work with atrazine showed that satisfactory post-emergence control of some weeds such as *Setaria glauca* and dicotyledonous species could be obtained. The control of *E. crus-galli* however, decreased as the plants increased in size from the one leaf to the six leaf stage at spraying.

In order to improve this control, glasshouse tests compared various adjuvants with atrazine. A surfactant, Plus 50, and an oil, BP Crop Oil, were selected for further work. It was shown that 0.5 gal. per acre (5.6 litres per hectare) of crop oil was the minimum addition to atrazine for satisfactory control of *E. crus-galli*. Maize was damaged by this amount of surfactant but not by the proportion of crop oil in the mixture.

Field tests were then begun, using the crop oil and surfactant at various concentrations and volumes of application. In one trial, on an alluvial loam, these gave mean rates of application of the crop oil and surfactant of 0.2, 0.8, and 2.2 gal. per acre (2.2, 9.0, and 24.7 litres per hectare), each combined with 1.0 or 2.0 lb a.i. per acre (1.1 or 2.2 kg per hectare) of atrazine.

The maize was hilled before the herbicide applications and a later germination of grasses was treated. These comprised *E. crus-galli* (25%), *S. glauca* (34%), and *Digitaria sanguinalis* (24%), each at the one to three leaf stage. Grass control was assessed by dry matter weights from random quadrats and maize yields by cob weights at maturity, as shown in Table 1.

Phytotoxicity symptoms were apparent in the mixtures containing the two higher rates of surfactant. This took the form of leaf burn and a gumming together of the leaves which in some cases caused a distortion of new leaf growth. The surfactant used alone also produced these symptoms.

The effect of decreasing weed control with increasing rate of adjuvants was unexpected and may have been due to a physical blocking of atrazine entry into the leaves.

It is evident that the crop oil is preferable as an adjuvant to the surfactant used. Grass control with the lower rate of

atrazine plus crop oil was inferior to that with the higher rate of atrazine alone. This was more marked in other field tests where *S. glauca* was absent and *E. crus-galli* the dominant species. Thus the aim in use of an adjuvant with atrazine should be to obtain better weed control rather than to attempt to lower the rate of atrazine.

TABLE 1

Mean Grass Control and Cob Weights, compared with Untreated Controls

Adjuvant	Atrazine 1.0 lb/ac		Atrazine 2.0 lb/ac	
	Grass Control	Cob Weights	Grass Control	Cob Weights
Nil	48.7%	103.2%	87.2%	93.3%
Crop Oil				
0.2 gal./ac	83.1%	94.7%	93.8%	97.4%
0.8 gal./ac.	75.4%	96.4%	89.7%	99.7%
2.2 gal./ac.	18.0%	94.0%	48.7%	95.3%
Surfactant				
0.2 gal./ac.	64.6%	79.8%	93.3%	84.2%
0.8 gal./ac.	38.0%	36.2%	70.8%	39.5%
2.2 gal./ac.	0%	11.5%	6.2%	6.9%

TOWARDS A SYSTEM OF LAND PREPARATION AND WEED CONTROL FOR AERIALLY SOWN RICE GROWN UNDER NATURAL RAINFALL IN NORTHERN AUSTRALIA

D.R. Airey
Northern Territory Administration, Northern Territory

In research into rice-growing methods on the subcoastal plains of northern Australia, the system receiving most attention involves aerially sowing rice into rainwater ponded in the fields.

The wet-season rainfall commences in October and increases each month, allowing ponding of rainfall to occur normally around the period mid December to late January.

At present, seedbed preparation is carried out using dry cultivation in December followed by puddling just prior to sowing.