

## PRELIMINARY STUDY OF THE EFFECTS OF SIMULATED HERBICIDE DRIFT ON COTTON

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*Summary.* The effects of dicamba and 2,4-D on cotton dry matter production were not significantly different. 2,4-D caused abnormal flower development and shedding of squares but dicamba did not.

### INTRODUCTION

Cotton is notoriously sensitive to 2,4-D and rates as low as 0.00011 kg ha<sup>-1</sup> at the early square stage can reduce the seed yield to nothing (Kasasian 1969). It is not uncommon for cotton crops in Queensland to be damaged by 2,4-D drift when the herbicide is applied to neighbouring sorghum crops.

Dicamba is an alternative herbicide to 2,4-D for controlling broad-leaved weeds in sorghum and there are indications that it is less harmful to cotton. In recent experiments in the U.S.A., application of dicamba at the rate of 0.016 kg ha<sup>-1</sup> at the pre-bloom stage did not significantly reduce the yield of seed cotton (Hamilton and Arle 1979) but there were no 2,4-D treatments in the experiments. The authors are unaware of any comparisons of the effects of the two herbicides on cotton, so a preliminary study was made of the effects of simulated drift of dicamba and 2,4-D on cotton dry matter production.

### MATERIALS AND METHODS

Cotton seed (cv. DPL 16) was planted in 20 cm diameter pots and the seedlings were thinned to three per pot. Dicamba and 2,4-D were applied at 0.1, 0.01 and 0.001 kg ha<sup>-1</sup> 17 days after planting when the plants were 15 to 20 cm high with four true leaves. There was also an untreated control. Two plants were removed from each pot for dry matter determination 36 days after planting and the single remaining plants were removed 58 days after planting when squares had developed. Dry matter yields were statistically analysed as a randomized block and, omitting the untreated control, as a balanced factorial design.

### RESULTS AND DISCUSSION

Dry matter yields are given in Table 1. At the second sampling 58 days after planting, dry matter production of plants treated with 0.1 kg ha<sup>-1</sup> was significantly less than that of plants treated with 0.001 kg/ha ( $P = 0.05$ ). There were no significant differences between the individual treatments and between the main effects of dicamba and 2,4-D.

Table 1. Effect of dicamba and 2,4-D on dry matter yield (means of the main effects).

Herbicide	Rate (kg ha <sup>-1</sup> )	Dry matter (g/pot)	
		Days after planting	
		36	58
dicamba		11.5	31.9
2,4-D		10.3	29.4
L.S.D. (P = 0.05)		N.S. <sup>1</sup>	N.S.
	0.1	9.7	28.1
	0.01	11.2	30.7
	0.001	12.0	33.2
L.S.D. (P = 0.05)		N.S.	3.95

<sup>1</sup> N.S. = Differences not significant.

Squares were shed from plants sprayed with 2,4-D at 0.1 and 0.01 kg ha<sup>-1</sup> but not from plants sprayed at the same rates with dicamba. Some of the flowers on plants sprayed with 2,4-D were abnormal but dicamba had no such effect.

Further studies should be carried out under field conditions to compare the effects of the two herbicides on seed cotton production.

#### LITERATURE CITED

- Hamilton, K.C. and H.F. Arle. 1979. Weed Sci. 27: 604-607.  
 Kasasian, L. 1969. Cotton Growing Review 46: 165-173.