Trifluralin without incorporation

A. G. Flynn

Department of Agriculture and Rural Affairs, Victorian Crops Research Institute, Horsham, Victoria, 3400, Australia

Trifluralin is one of the most important herbicides in Australia used on over 2.5 million ha annually. It gives inexpensive control of many major weed species including annual ryegrass, wireweed and Johnson grass. However, when applied, trifluralin must be incorporated twice resulting in damage to soil structure and costing extra time, labour, equipment and money.

The aim of this project is to develop a formulation of trifluralin which does not need incorporation.

Methods

Two trifluralin formulations, a volatile emulsifiable concentrate (EC) and a non-volatile NT002, were applied at rates equivalent to 0, 40, 80, 200, 400 and 600 g trifluralin/ha to 500 g of an acidic sandy loam in punnets (140 x 85 x 50 mm3). The soil was pre-moistened to 10% water. After being sprayed, the soil was mixed thoroughly at 0, 2 or 24 h and was then sown with 20 seeds of annual ryegrass per punnet. Emergence was assessed after 10 days of growth in a glasshouse and a series of calibration curves were drawn.

Results and discussion

At the commercial rate of 400 g trifluralin/ha approximately 70% of the potency of EC was lost within 24 h with only 10% more being lost in the next 22 h. NT002 applied at the same rate lost no activity when mixing was delayed up to 24 hrs. When mixed immediately to minimise

volatilisation losses, NT002 was significantly more active at 40 and 80 g trifluralin/ha than the EC. This is surprising as it suggests that volatilisation is either extremely rapid, occurring in less than one minute or that trifluralin in the non-volatile form is considerably more potent.

The results indicate that there is considerable potential within formulation skills for greatly decreasing volatilisation from trifluralin which would eliminate the need for incorporation and decrease the recommended doses.

Table 1. The effect of rate and delayed incorporation of two formulations of trifluralin on the emergence number per punnet of annual ryegrass sown at 20 seeds/punnet

	EC			NT002		
Delay to mixing (h)	0	2	24	0	2	24
Treatment (g trifluralin/ha)						
0	12.4	14.0	14.0	12.4	14.0	14.0
40	13.2	11.4	13.2	1.5	10.6	13.6
80	5.0	13.6	12.0	0.8	10.8	13.6
200	1.0	7.0	12.0	0.8	3.0	5.8
400	0.2	3.6	6.8	0.2	0.0	0.8
600	0.2	1.0	3.0	0.0	1.2	1.2

LSD (P=0.05) = 2.8