The effect of pre-emergent herbicides on perennial grass seedlings

G.A.Sandral and B.S.Dear

Agricultural Research Institute, Wagga Wagga, NSW. 2650

Perennial grasses are being promoted as a valuable component of pastures in ley farming in eastern Australia. One of the major problems however is weed control in the establishment year, particularly when sown with a cover crop. Currently there are very few post-emergent herbicide options that can be used to control annual ryegrass or wild oats in establishing phalaris or cocksfoot. However experience has shown that reliance on a narrow range of herbicides may enhance the emergence of annual ryegrass resistance. A number of strategies have been developed to reduce selection pressures for annual ryegrass resistance such as the use of herbicides with different modes of action. The aim of this study was to identify pre-emergent herbicides that could be used in cover crops undersown with phalaris or cocksfoot.

Methods

A glasshouse experiment was conducted with 6 perennial grass species, 2 cereal crops, subterranean clover and annual ryegrass. Herbicide treatments included an unsprayed control and 9 pre-emergent grass herbicides (Table 1). Each pot contained 10, 20 or 40 plants, depending on seed size. The experiment was a row column design with 3 replications and additional unsprayed controls included to improve treatment comparisons. Herbicides were applied either pre-sowing or post sowing pre-emergence. Dry matter yield measured 30 days after spraying are presented for phalaris, cocksfoot and annual ryegrass.

Results and discussion

Both phalaris and cocksfoot seedlings were only slightly suppressed by the application of either Avedex BW® or Spinnaker® (Figure 1). In contrast the herbicides Logran®, Sencor SC®, Bladex®, Yield® and Glean® all controlled annual ryegrass but also caused significant levels of plant death in

Table 1. Pre-emergent herbicides and herbicide rates, applied to plant species/cultivars

Herbicides and rates								
Avedex BW 2.0 L/ha	Logran 0.30 kg/ha	Sencor SC 0.435 L/ha	Bladex 3.0 L/ha	Spinnaker 0.25 L/ha	Trifluralin CR 1.0 L/ha	Stomp 2.0 L/ha	Yield 1.6 L/ha	Glean 0.15 kg/ha
Plant species and cultivar								
Phalaris cv. Sirolan	Cocksfoot cv. Currie	Wallaby grass cv. Taranna	Perennial ryegrass cv. Kangaroo Valley	Tall Fescue cv. Demeter	Lovegrass cv. Consol	Wheat cv. Dollarbird	Oats cv. Cooba	Annual ryegrass cv. Wimmera	Sub clover cv. Trikkala

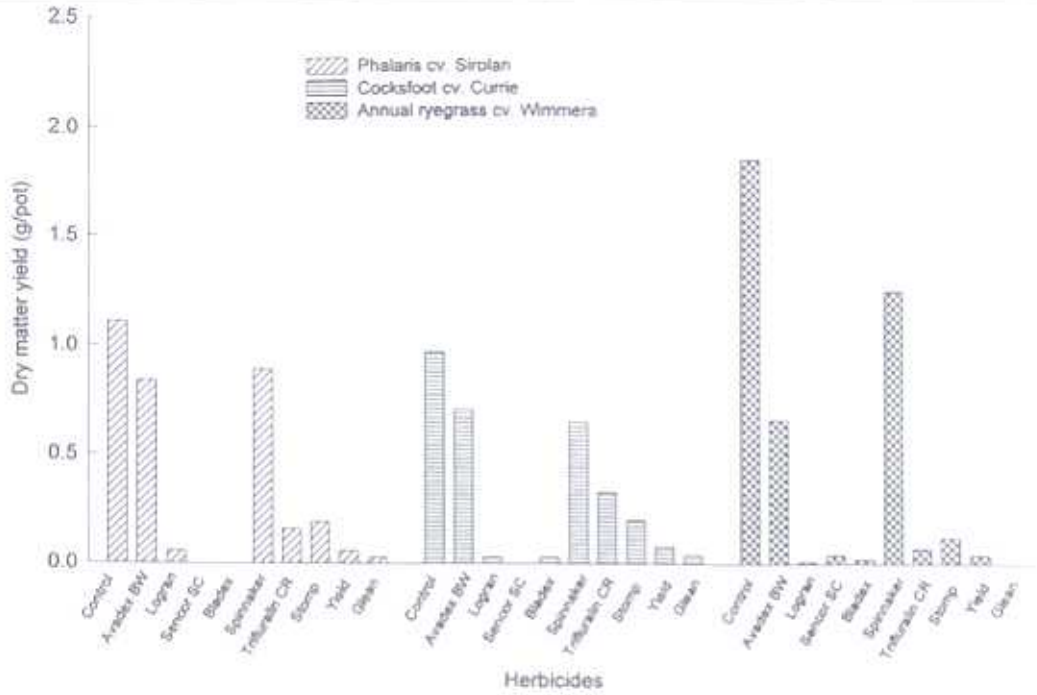

Figure 1. Dry matter yield of phalaris, cocksfoot and annual ryegrass 30 days after the application of 9 post-emergent herbicides.

phalaris and cocksfoot. Trifluralin and Stomp® caused significant dry matter losses to both phalaris and cocksfoot. However, further studies are needed to identify if they have any potential for use in establishment of perennial grasses under field conditions.

As all seeds where sown the day after herbicide application further field experimentation is needed to determine if a delayed sowing in relation to herbicide application will reduce plant damage. The herbicides applied pre-sowing were mixed in a 2 cm layer of soil resulting in the herbicide band being more concentrated than is likely under field conditions. This may also have accentuated phytotoxicity of the herbicides.