

# Managing herbicide resistance in ryegrass

## Background

Herbicide resistant weeds are becoming alarmingly common and dealing with resistance is becoming more and more difficult. Any farmer that still thinks cropping out of a drum is sustainable must think again!

At the Birchip Cropping Group Herbicide Resistance trial site (St Arnaud, Victoria) herbicide resistance and tolerance in ryegrass has been identified to most herbicide groups which have activity on ryegrass, including glyphosate (Table 2.5). Wild oat resistance to Group A mode of action herbicides has also been observed in 1998.

**Table 2.5 Ryegrass survival (%) from applying half, normal and double rate applications of herbicides with activity on ryegrass. Tests undertaken by Charles Sturt University.**

	% ryegrass survival			
rate applied	Hoegrass 375 gai	Roundup 360 gai	Trifluralin 400 gai	Glean 750 gai
0.5 rate	88	63	35	40
1.0 rate*	88	23	20	35
2.0 rate	75	7	15	25
	Resistant	Tolerance developing	Resistance developing	Resistance developing

\*herbicide recommended rate (Hoegrass 1L/ha, Roundup 1.6L/ha, Trifluralin 1L/ha, Glean 20g/ha  
gai = grams active ingredient

The farm where this problem has developed is a well managed intensively cropped farm in Central Victoria. For over fifteen years, crops have been direct drilled with stubbles retained. The whole property is intensively cropped with canola, wheat, barley, lupins and chickpeas. Some years ago ryegrass resistance to group A mode of action herbicides was identified and vetch hay was incorporated into the rotation. Vetch hay enabled a season with reduced weed set and was successful in reducing weed numbers. At the same time more reliance was placed on knockdown sprays for control, and trifluralin was reintroduced on the farm. Trifluralin has been used successfully at high rates because crops were sown with narrow points which moved the herbicide from the sowing row, resulting in minimal crop damage.

Glean and Logran have not been used much on this farm because the soils are alkaline (these chemicals break down slowly in alkaline soils thereby reducing crop choice flexibility). As can be seen from the table, some level of cross resistance to Glean has already occurred, implying that the successful control of ryegrass with Group B herbicides will only be short lived.

On this farm, chemical control options are now very limited and without a well thought out plan to control grass weeds, crop production as currently practiced will cease. This year, following two knockdown sprays and 2L trifluralin applied post sowing pre-emergent, ryegrass populations still exceed 300 plants per square metre!

If ryegrass develops resistance to glyphosate the problem becomes extreme!

A weed control plan must be both agronomically and financially based. Crop establishment techniques need to be developed which optimise production as well as being financially viable in the long-term. The Birchip Cropping Group will continue working in this area to make this a reality.

The trials undertaken by the BCG in 1998 had a focus on herbicide control options and alternative strategies for the reduction in seed set of ryegrass. Four large scale trials were established with the main focus on controlling ryegrass.

1. Trifluralin use in wheat
2. Atrazine for the control of ryegrass
3. Competitive crops
4. Late sowing and alternative harvesting techniques