

TRIAL RESULTS

Herbicide options for the control of brome grass in wheat and barley

Sam Kleemann & Gurjeet Gill, The University of Adelaide, Ph (08) 8303 7908

DURATION

1 Year

LOCATION

Warooka

SOIL

TYPE SURFACE:

Grey Mallee Loam

TYPE SUBSOIL:

Limestone Rubble

PH SURFACE:

PH SUBSOIL:

ROOT DEPTH:

PLOT SIZE

5m x 10m

REPLICATES

3

KEY OUTCOMES

- ⊙ The use of Midas® herbicide in Clearfield - Janz or Stiletto wheats appears to be an effective option for controlling brome grass in wheat.
- ⊙ Group B herbicides, Atlantis® and Monza®, are alternatives to the Clearfield system for brome control. However, these herbicides provide plant suppression rather than plant kill and in our studies in 2003 their efficacy appeared to be erratic.
- ⊙ Pre-emergent applications of metribuzin (Lexone®) with pendimethalin (Stomp®) incorporated by sowing resulted in reasonable levels of brome control in barley (70%). However, higher rates of metribuzin are required for high rainfall situations where this herbicide can be readily leached, thereby reducing its activity. Note caution should be taken when using higher rates of metribuzin as crop damage can result.

TRIAL OBJECTIVES

Investigate herbicide options for the control of brome grass in wheat and barley

TREATMENTS

Herbicide treatments for wheat and barley are shown in Tables 1 and 2. Pre-sowing herbicide treatments were randomised and sprayed prior to and across the direction of sowing single strips of "Clearfield"-Janz wheat and Sloop barley on the 17th June. "Clearfield"-Janz was sown to safely assess post-emergent herbicide,

Midas®, which was specifically developed for use in "Clearfield" wheats. Post-emergent herbicides were applied according to label recommendations, using appropriate adjuvants and a 100 L/ha water rate. Brome emergence was assessed on the 17th of July and 8th August.

TRIAL RESULTS

Table 1. Effect of pre and post emergent herbicide treatments on the control of brome grass in "Clearfield"-Janz wheat, at Warooka in 2003.

Herbicide Treatment	Brome density (plants/m ²)	% Control	Rank	Herbicide cost (\$/ha)
Post emergent				
Midas® 900ml/ha	8	82	1	35.90
Atlantis® 330ml/ha	16	64	3	25.70
Monza® 25g/ha	29	34	7	26.30
Treflan 1.2L/ha (IBS) + Midas® 900ml/ha	10	77	2	45.10
Treflan 1.2L/ha (IBS) + Atlantis® 330ml/ha	22	50	4	34.90
Treflan 1.2L/ha (IBS) + Monza® 25g/ha	25	43	5	35.50
Pre-emergent				
Cinmethylin 375ml/ha (IBS)	26	41	6	-
Treflan 1.2L/ha (IBS)	31	30	8	9.20
Control (no herbicide)	44	-	9	-
LSD (0.05)	11			

- * Incorporated by sowing (IBS)
- * Midas®, Atlantis® and Monza® applied to wheat at 3-4 leaf stage (Zadok 13 & 14)

Brome control in wheat

Herbicide Midas® (Clearfield System) resulted in an 82% reduction in brome density (8 plants m⁻²) over the control treatment (44 plants m⁻²)(Table 1). Addition of pre-emergent Treflan (1.2 L/ha) to Midas® did not enhance the level of control over that provided by Midas® alone. However, poor levels of brome control resulted in plots where only pre-emergent herbicides Treflan (30%) and cinmethylin (41%) were applied. Furthermore, post-emergent herbicides Atlantis® and Monza® resulted in moderate to poor levels of brome control, reducing brome densities by 64% and 34% respectively. The application of post-emergent Atlan-

tis® to the crop treated with pre-sowing Treflan appeared to lower the efficacy of Atlantis®. The sequential application of these two herbicides gave 50% control of brome as compared to 64% in Atlantis® alone. On the other hand, the level of brome control improved slightly (9%) when post emergent Monza® was applied to plots treated with treflan. However, justification for using either Atlantis® or Monza® with or without treflan would be difficult considering the poor efficacy (34% – 64%) and high costs of these herbicides (\$25.7 to \$35.5/ha).

Table 2. Effect of pre and post emergent herbicide treatments on the control of brome grass in Sloop barley, at Warooka in 2003.

Herbicide treatment	Brome density (plants/m ²)	% Control	Rank	Herbicide cost (\$/ha)
Pre-emergent—Metribuzin (incorporated by sowing)				
Metribuzin 150g/ha (IBS)	23	12	8	10.80
Metribuzin 200g/ha (IBS)	16	41	=5	14.40
Treflan 1.2L/ha + Metribuzin 150g/ha (IBS)	16	41	=5	20.00
Treflan 1.2L/ha + Metribuzin 200g/ha (IBS)	12	53	=4	23.60
Pendimethalin 1.8L/ha + Metribuzin 150g/ha (IBS)	9	66	2	20.90
Pendimethalin 1.8L/ha + Metribuzin 200g/ha (IBS)	8	70	1	24.50
Post-emergent - Metribuzin (Zadok 12 or 2 leaf barley)				
Metribuzin 200g/ha (Z12)	9	65	3	14.40
Treflan 1.2L/ha + Metribuzin 200g/ha (Z12)	16	40	6	23.60
Pendimethalin 1.8L/ha + Metribuzin 200g/ha (Z12)	12	33	=4	24.50
Treflan 1.2L/ha (IBS)	22	19	7	9.20
Pendimethalin 1.8L/ha (IBS)	24	9	9	10.10
Control (no herbicide)	26	-	10	-
LSD (0.05)	5			

*Metribuzin treatments were either applied pre-emergent and incorporated by sowing (IBS) or post-emergent (Zadok 12) as barley's 2nd leaf was emerging.

Brome control in barley

Metribuzin (Lexone®) applied at 200 g/ha incorporated at sowing (IBS) with 1.8 L/ha of pendimethalin (Stomp®) resulted in a 70% reduction in brome density (8 plants m⁻²) as compared to the control treatment (26 plants m⁻²)(Table 2). Previous field studies have shown that when metribuzin is applied as a pre-emergent IBS treatment, under ideal conditions (moist soil) >80% control of brome is achievable. However, at this site, metribuzin applied alone at 200g/ha as a pre-emergent IBS treatment, only gave 41% reduction in brome density. The inability of metribuzin to control brome at this site when applied either alone or in combination with treflan or pendimethalin, could be a result of the herbicide being leached from the upper soil profile, following significant rainfall (50mm) at sowing. This herbi-

cide is noted for its water solubility and rapid mobility in the soil, particularly on light textured soils low in organic matter. Leaching of the herbicide at depth would dilute its concentration in the zone where brome seeds are germinating, resulting in poor residual activity and overall control of brome. Considering the timing and amount of rainfall received at this site the rates of metribuzin applied (150 & 200 g/ha) would have been sub-lethal for brome. In retrospect higher rates of metribuzin (250 to 300g/ha) were required.

However, caution needs to be taken when using high rates of metribuzin as crop damage can occur, particularly on light textured soils.

CONCLUSIONS & INTO THE PADDOCK

Although there are now more herbicides available for the control of brome in wheat, only Midas[®] herbicide appears to provide consistent control of brome grass. Atlantis[®] and Monza[®], which can be used in all wheat cultivars, were found to provide less effective control of this weed species. Furthermore, surviving brome plants following applications of Atlantis[®] and Monza[®] show varying levels of recovery resulting in considerable seed set. Considering the herbicide costs alone for Midas[®] (\$35.9/ha), Atlantis[®] (\$25.7/ha) and Monza[®] (\$26.3), a better option to tackle a situation of escalating brome could be to change the rotation, replacing wheat with a more competitive barley crop in which metribuzin (\$10.8/ha) could be applied. Although the level of control of brome with metribuzin was moderate in barley at this site (70%), barley provides much greater weed suppression and would have been able to minimise weed seed set. Higher rates (250 to 300 g/ha) of metribuzin will be assessed in this high rainfall environment in 2004. Metribuzin (Lexone[®]) at \$10.8/ha remains a cost effective option for the control of brome in barley.

ACKNOWLEDGEMENTS

Grains Research & Development Corporation (GRDC)
for project funding.

Farmer collaborators – Roger and Jamie Murdoch



Graham Betts Spray Day , 6th August 2003