# Brome grass control in wheat

The aim of this trial was to compare control options for Brome grass in wheat and investigate two new options – Clearfield wheat technology and Atlantis herbicide.

**Summary of trial**
Managing Brome grass populations in wheat is a challenge facing many growers but chemical control options have increased over the past two seasons with the introduction of Clearfield wheat technology and Atlantis herbicide.

In 2002 the Clearfield system (Midas herbicide and JNZ Clearfield wheat) and the two knockdown treatments Gramoxone and RoundUp (applied at the 0.5 leaf crop stage) delivered significantly better Brome grass control than any other treatment.

Atlantis and Monza applied in-crop and Trifluralin + Lexone incorporated by sowing all delivered significantly higher Brome control than Trifluralin, Stomp or Lexone but significantly lower control than the Clearfield system, Gramoxone and Roundup.Trifluralin,

Product selection had a significant impact on crop safety. The two knockdown products, RoundUp and Gramoxone, caused significantly more crop damage than the other treatments. All other treatments caused low levels of crop effect.

Longterm planning and an integrated strategy is essential if effective management of Brome grass populations is to occur. Crop rotation, delayed sowing and promoting healthy, competitive crops will aid in the control of Brome grass.

**Why it was conducted:**
Brome grass is an ever-increasing problem facing grain growers especially those on the lighter soils of the Mallee and northern Wimmera. Pressure from high populations can lead to significant grain yield penalties and even downgrading due to contamination at harvest. Currently very few registered chemicals are available to control Brome grass in wheat. This trial investigated both registered and unregistered chemical control options.

**How it was conducted:**
A trial was established at the Birchip site in the 2002 season to investigate both registered and unregistered chemical control options for Brome grass in wheat.

Yitpi and JNZ Clearfield wheat were sown at 80kg/ha with 80kg/ha of Mallee Mix 1. Sowing occurred on the 27$^{th}$ May. All treatments were pre-drilled with urea at 40kg/ha on the 2$^{nd}$ May.

No knockdown herbicides were applied prior to sowing to ensure high Brome grass populations were present at seeding.

Herbicide treatments were applied as per Table 1.

**Table 1.** Brome grass control options including timing, product and rate.

| Trt # | Timing | Product | Active Ingredient | Rate ( / ha) |
|---|---|---|---|---|
| 1 | - | Control | - | - |
| 2 | IBS | Triflur 480 | *trifluralin* | 1.2L |
| 3 | IBS | Stomp | *pendimethalin* | 1.8L |
| 4 | IBS | Triflur 480 + Lexone | *trifluralin + metribuzin* | 0.8 + 150g |
| 5 | Crop 0.5 leaf | RoundUp Max | *glyphosate* | 0.3L |
| 6 | Crop 0.5 leaf | Gramoxone | *paraquat* | 0.6L |
| 7 | Crop 4 leaf | Lexone | *metribuzin* | 280g |
| 8 | Brome 3 leaf | Monza | *?????* | 20g |
| 9 | Crop 3 leaf<br>Brome 1.5 tillers | Atlantis | *mesosulfuron-methyl* | 330mL |
| 10 | Crop 4 leaf<br>Brome 2 tillers | Midas<br>(Jnz Clearfield) | *imazapic + imazapyr+ MCPA* | 0.9L |

The trial was conduct using a fully randomised replicated block design.

**Results of the trial:**

Crop establishment was below optimum at 131 plants/m$^2$ but none of the chemical treatments had an influence. Brome grass was considered to be present at moderate levels at 24 plants/m$^2$.

The trial was not taken through to harvest to prevent Brome grass seed set however phytotoxicity scores were recorded on two occasions during the season. The results of monitoring conducted in early October 2002 are presented in Table 2.

**Table 2:** Crop damage and Brome grass control achieved for a range of chemical treatments

| Trt # | Timing | Product | Rate | Phytoxicity | |
|---|---|---|---|---|---|
| | | | | Crop effect | Brome grass effect |
| 1 | - | Control | - | 1.00 | 1.00 |
| 2 | IBS | Triflur 480 | 1.2L | 2.75 | 1.75 |
| 3 | IBS | Stomp | 1.8L | 2.50 | 2.00 |
| 4 | IBS | Triflur 480 + Lexone | 0.8 + 150g | 2.75 | 4.25 |
| 5 | Crop 0.5 leaf | RoundUp Max | 0.3L | 4.25 | 5.75 |
| 6 | Crop 0.5 leaf | Gramoxone | 0.6L | 3.50 | 5.75 |
| 7 | Crop 4 leaf | Lexone | 280g | 1.75 | 2.00 |
| 8 | Brome 3 leaf | Monza | 20g | 2.00 | 4.25 |
| 9 | Crop 3 leaf<br>Brome 1.5 tillers | Atlantis | 330mL | 2.50 | 4.75 |
| 10 | Crop 4 leaf<br>Brome 2 tillers | Midas (Jnz Clearfield) | 0.9L | 2.00 | 6.00 |
| **Significance** | | | | P<0.001<br>LSD=0.85 | P<0.001<br>LSD=1.12 |

*Phytotoxicity score: 1- no symptoms evident; 3 – slight symptoms; 5- severe symptoms; 7 – heavy damage; 9 – complete loss of plants*

Product selection had a significant effect on both crop health and weed control.

*Weed control*
The Clearfield system (Midas herbicide and JNZ Clearfield wheat) and the two knockdown treatments Gramoxone and RoundUp (applied at the 0.5 leaf crop stage) delivered significantly better Brome grass control than any other treatment.

Atlantis and Monza applied in-crop and Trifluralin + Lexone incorporated by sowing all delivered significantly higher Brome control than Trifluralin, Stomp or Lexone but significantly lower control than the Clearfield system, Gramoxone and Roundup.

Trifluralin, Stomp and Lexone herbicides gave the lowest levels of weed control.

*Crop safety*
Product selection had a significant impact on crop safety. The two knockdown products, RoundUp and Gramoxone, caused significantly more crop damage than the other treatments. All other treatments caused low levels of crop effect.

**Interpretation:**
The Group D products, Trifluralin and Stomp, provided very poor control on Brome. This result was not unexpected as both Trifluralin and Stomp have very little activity on Brome grass and neither product is registered for Brome control.

Lexone (Group C) applied in-crop when the crop was at the 4-leaf stage also displayed poor activity on Brome. Lexone is not registered for use in wheat but past research conducted by the BCG has found Lexone can provide very good control of Brome grass with reasonable crop safety. The window of application for effective and safe application of Lexone is however both small and critical. Soil moisture and rainfall after application are critical to activating this chemical and as both were lacking during the 2002 season Lexone's performance was compromised. Interestingly, the Trifluralin + Lexone treatment applied and incorporated by sowing gave significantly better Brome grass control than either Trifluralin incorporated by sowing or Lexone applied in-crop. This practice is not registered.

RoundUp and Gramoxone when applied before the 0.5 leaf stage gave very good control on Brome grass but significant crop damage resulted. This practice is high risk and is not recommended except as a last resort measure. Of the two products Gramoxone has been found to provide better crop safety than RoundUp. This is because Gramoxone is a contact desiccant whereas RoundUp is a translocated herbicide and may move down the stem and into the root system.

Monza and Atlantis, both Group B sulphonylurea herbicides, provided an acceptable level of Brome grass control in 2002. Both displayed good crop safety and are registered for use in wheat. Plant back restrictions do apply for both products.

The Clearfield system, which consists of Midas herbicide (Group B + I) and an imidazolinone tolerant wheat (JNZ Clearfield), provided the highest level of Brome grass control in 2002. Midas is restricted to use in IT-wheat varieties. Plant back restrictions occur with this product and being an imidazolinone herbicide it will persist longer on acid soils than alkaline soils. Minimum rainfall requirements for breakdown exist so residues may present issues even on alkaline soils.

**Commercial practice:**

Longterm planning and an integrated strategy is essential if effective management of Brome grass populations is to occur. Crop rotation, delayed sowing and promoting healthy, competitive crops will aid in the control of Brome grass.

Chemical control options for Brome grass in wheat have increased over the past two seasons with the introduction of Clearfield wheat technology and Atlantis herbicide.

Monza, Atlantis and Midas are all effective herbicides that have their fit for Brome grass control in wheat, however limitations exist with these products. All three are Group B chemistry with residual activity therefore plant back issues and herbicide resistance issues resulting from further reliance on Group B chemistry in our farming practices must be considered.

*The BCG would like to acknowledge the contribution that Tom Lord, University of Melbourne, Dookie campus has made to this trial.*