

# CLEARFIELD® Tolerant Juncea Canola Crop tolerance evaluation



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## Take home messages

- DPI-Horsham are currently breeding Clearfield® tolerant Juncea canola varieties
- The Clearfield® tolerant varieties express a high level of tolerance to recommended rates of the imidazolinone herbicides.
- These Clearfield® tolerant varieties will most likely be commercially available in 2009

## Methods

These trials were conducted by BCG for the Department of Primary Industries as part of a pre-release evaluation (crop tolerance testing) of potential new canola quality *Brassica juncea* varieties (J05Z-08920 and J05Z-08960) for tolerance to the appropriate CLEARFIELD® (imidazolinone) herbicide products. Comparator varieties were Dune (intolerant Juncea canola) and Pioneer 44C73 (tolerant *B. napus* canola).

Trials were sown at Birchip (1 June 2007) and Longerenong (8 June 2007) with a seeding rate of 5kg/ha, MAP applied at 60kg/ha and 50kg/ha of nitrogen predrilled as urea. A split-plot design was used with varieties as main plots and herbicide treatments as sub-plots, with 3 replicates. TriflurX (1.5 L/ha) and Endosulfan (500 ml/ha) were applied at the Birchip site immediately post sowing and incorporated using rolling harrows.

Intervix herbicide was applied at the 4 leaf stage at 3 rates (0, 750 ml/ha and 1.5 L/ha) using a hand boom at Birchip and a 3m boomspray at Longerenong. Crop injury assessments were conducted 10 days post application and 21 days post application. Flowering dates were recorded and grain yield harvested at the Longerenong site.

## Results

At both Longerenong (Table 1) and Birchip (Table 2) the Clearfield® Juncea canola lines JO5Z-08920 and JO5Z-08960 displayed a high level of tolerance to both the 1X (750 ml/ha) and 2X (1.5 L/ha) rates of Intervix, compared to the intolerant control variety Dune. The Clearfield® tolerant canola variety Pioneer 44C73, used as a tolerant check, was also highly tolerant of both the 1X and 2X rates.

For the IMI tolerant varieties, there was no effect on the flowering dates at either site through the application of either the 1X or 2X rate of Intervix. However, plant death occurred for both rates of Intervix for the intolerant check variety Dune.

Grain yields were also harvested at the Longerenong site. Virtually no yield was recorded for the variety Dune, even at the nil rate of Intervix; this result is very difficult to interpret given the visual observations that the level of biomass at the nil herbicide treatment was similar to the other varieties at maturity. Yields of the two new Clearfield® tolerant Juncea canola breeding lines were not significantly different to the tolerant *B. napus* variety Pioneer 44C73. Interestingly, there was a significant yield response to the application of Intervix to the tolerant varieties of both *B. juncea* and *B. napus*. Whilst this may be in response to improved weed control in these plots, visual inspection indicated that the level of weeds (predominately *Lamium* spp.) within the plots was unlikely to cause such yield losses.



**Table 1:** Percentage plants expressing symptoms of herbicide damage following the application of 1X and 2X rate of Intervix, Julian day for 50% flowering and grain yield (kg/ha) for *B. juncea* and *B. napus* varieties at Longerenong.

| Variety      | Intervix Rate | % plants expressing symptoms |       | Mean Julian day* at 50% flowering | Grain Yield (kg/ha) |
|--------------|---------------|------------------------------|-------|-----------------------------------|---------------------|
|              |               | 10DAA                        | 21DAA |                                   |                     |
| Dune         | 0             | 0                            | 0     | 261                               | 60                  |
| Dune         | 1X            | 18                           | 80    | DNF                               | 2                   |
| Dune         | 2X            | 35                           | 100   | DNF                               | 0                   |
| JO5Z-08920   | 0             | 0                            | 0     | 260                               | 206                 |
| JO5Z-08920   | 1X            | 0                            | 0     | 260                               | 519                 |
| JO5Z-08920   | 2X            | 0                            | 0     | 259                               | 571                 |
| JO5Z-08960   | 0             | 0                            | 0     | 255                               | 230                 |
| JO5Z-08960   | 1X            | 1                            | 0     | 255                               | 522                 |
| JO5Z-08960   | 2X            | 1                            | 0     | 255                               | 440                 |
| Pioneer44C73 | 0             | 0                            | 0     | 256                               | 285                 |
| Pioneer44C73 | 1X            | 1                            | 0     | 255                               | 394                 |
| Pioneer44C73 | 2X            | 1                            | 0     | 255                               | 452                 |

\* Julian Day is based on the number of days in the calendar year – Julian Day 255 = 12th Sept

**Table 2:** Percentage plants expressing symptoms of herbicide damage following the application of 1X and 2X rate of Intervix, and the mean Julian day for 50% flowering for *B. juncea* and *B. napus* varieties at Birchip.

| Variety      | Intervix Rate | % plants expressing symptoms |       | Mean Julian day* at 50% flowering |
|--------------|---------------|------------------------------|-------|-----------------------------------|
|              |               | 10DAA                        | 14DAA |                                   |
| Dune         | 0             | 0                            | 1     | 249                               |
| Dune         | 1X            | 65                           | 46    | DNF                               |
| Dune         | 2X            | 80                           | 76    | DNF                               |
| JO5Z-08920   | 0             | 0                            | 4     | 244                               |
| JO5Z-08920   | 1X            | 3                            | 4     | 244                               |
| JO5Z-08920   | 2X            | 0                            | 5     | 244                               |
| JO5Z-08960   | 0             | 0                            | 1     | 242                               |
| JO5Z-08960   | 1X            | 1                            | 0     | 242                               |
| JO5Z-08960   | 2X            | 0                            | 0     | 242                               |
| Pioneer44C73 | 0             | 0                            | 11    | 249                               |
| Pioneer44C73 | 1X            | 0                            | 13    | 249                               |
| Pioneer44C73 | 2X            | 1                            | 11    | 249                               |

## Commercial practice

Clearfield® tolerant Juncea canola varieties will provide an option for Mallee growers to include an alternative Brassica species in their crop rotations. Both Clearfield® Juncea canola lines evaluated will undergo further commercial seed production and further yield and crop tolerance testing in 2008. If their performance is satisfactory they will be commercially available in 2009.