

# Legume and oilseed herbicide tolerance

## Key findings

- In the post emergent treatments a range of herbicides produced very good control of all oilseed and legume crops included.

## Why do the trial?

To compare the tolerance of legume and canola varieties to a range of herbicides and timings.

## How was it done?

|                     |                           |                   |                                    |
|---------------------|---------------------------|-------------------|------------------------------------|
| <b>Plot size</b>    | 2.0 m x 3.0 m             | <b>Fertiliser</b> | MAP (10:22) + 2% Zn @ 80-100 kg/ha |
| <b>Seeding date</b> | 2 <sup>nd</sup> June 2016 |                   |                                    |

Thirteen strips of canola, pasture, vetch, chickpea, faba bean, field pea and lentils were sown. Sixty herbicide treatments were applied across all 13 crops at different timings.

The timings were:

|                                  |                         |
|----------------------------------|-------------------------|
| Post seeding pre-emergent (PSPE) | 7 <sup>th</sup> June    |
| Early post emergent (3-4 node)   | 14 <sup>th</sup> July   |
| Post emergent (5-6 node)         | 4 <sup>th</sup> August  |
| Late post emergent (8 node)      | 25 <sup>th</sup> August |

Treatments were visually assessed and scored for herbicide effects approximately four weeks after application (Table 1).

Crop damage ratings were:

- 1 = no effect
- 2 = slight effect
- 3 = moderate effect
- 4 = increasing effect
- 5 = severe effect
- 6 = death

## Results

Many of the herbicides are not registered for the crops that have been sprayed. It is important to check the herbicide label before following strategies used in this demonstration. Herbicide effects can vary between seasons and depend on soil and weather conditions at time of application.

***In 2016, a number of the herbicide treatments produced different crop tolerance affects compared to other seasons and care should be taken when interpreting these results. The trial was located over the previous year's commercial canola (44Y89) crop which received 455 mL/ha of intervix on 23/07/2015. In general it was hard to see any significant carry over herbicide effects in the nil strips for any of the crop types or varieties selected. Hurricane lentils and Angel medic were the only crop/varieties to show minor damage symptoms in the nil strips.***

Majority of the post sowing pre-emergent (PSPE) herbicide applications in 2016 had no effect on crop growth compared to the nil. This would not usually be expected and contrary to many experiences in the field this season.

In 2013 Broadstrike was one of the safest herbicides at the 3<sup>rd</sup> node stage, but in 2016, 2015 and 2014 produced severe effects to both vetch varieties (RM4 and Volga) and Frontier/Zulu II clover and Wilpena Sulla. Simazine caused similar damage on the chickpea and Jumbo 2 lentils compared to 2015. At this timing, metribuzin was also more damaging to both lentil varieties. Ecopar is only currently registered in pastures and its use in other crops is off label. However, at the 3<sup>rd</sup> node stage it appeared to give only slight damage to most of the legumes, but moderate damage to the lentils.

In the post emergent treatments a range of herbicides produced very good control of all the oilseed and legume crops. These included Ecopar, carfentrazone, Conclude, Paradigm, Precept, Velocity, Flight, Triathlon and Banvel M. Ecopar was safer on field peas in 2016, but this result would not normally be expected.

Pixxaro herbicide with Arylex active (16.25 g/L Arylex + 250 g/L fluroxypyr) is a post-emergent herbicide for use in all Winter cereals from 3 leaf to flag leaf for the control of a range of broadleaf weeds, including marshmallow. Use in Summer fallow will also be an option. Pending registration for use in 2017. It gave very good control of the legume crops in 2016.

Rexade is a new post emergent grass plus broadleaf herbicide for use in wheat. It contains the group B herbicide pyroxsulam plus the new Group I herbicide Arylex (halauxifen-methyl). It can be tank mixed with a range of broadleaf herbicides, typically MCPA LVE. Pending registration for use in 2017. It also gave very good control of the legume crops, with improved control of canola.

Talinor (37.5 g/L bicyclopyrone and 175 g/L bromoxynil) is a new fast acting cereal broadleaf herbicide that offers broad spectrum post-emergent weed control in wheat and barley (excluding durum). Talinor controls more than 38 weeds including tough to control weeds like bifora, wild radish, fumitory, wireweed and volunteer pulses. Pending registration for use in 2017. It also gave excellent control of all the legume and oilseed crop types in 2016.

In the 8 node treatments Gunyah peas were a standout by tolerating MCPA sodium and amine, and a low rate of 2,4-D ester. In the knockdown treatments both vetch lines were the most difficult to control, with the woolly pod vetch being the hardest. Gramoxone B-power or glyphosate mixed with 2,4-D amine or dicamba gave the best control in 2016.

Table 1. Crop damage ratings for legume and oilseed herbicide tolerance trial at Hart 2016.

| Number | Timing                                     | Herbicide (ai/ kg or L)   | Rate (g or mL/ha)     | Pasture       |         | Lentil    |           | Vetch   |       | C/pea | Pea        | Bean   | Canola |               |            |                |
|--------|--|---|-----------------------|---------------|---------|-----------|-----------|---------|-------|-------|------------|--------|--------|---------------|------------|----------------|
|        |  |   |                       | Wilpena Sulla | Zulu II | Sultan SU | Hurricane | Jumbo 2 | Volga | RM 4  | Genesis090 | Gunyah | Nura   | Pioneer 44Y90 | Hyola659TT | Nuseed diamond |
| 1      | PSPE 07/06/2016                            | NIL   |                       | 10            | 8       | 10        | 55        | 45      | 45    | 80    | 100        | 140    | 5      | 5             | 5          |                |
| 2      |  | Diuron (900g/kg)  | 550                   | 6             | 6       | 1         | 1         | 1       | 1     | 1     | 1          | 1      | 1      | 1             | 1          | 1              |
| 3      |  | Diuron (900g/kg)  | 825                   | 6             | 6       | 1         | 1         | 1       | 1     | 1     | 1          | 1      | 1      | 5             | 5          | 5              |
| 4      |  | Simazine (900g/kg)  | 550                   | 4             | 5       | 2         | 1         | 1       | 1     | 1     | 1          | 1      | 1      | 3             | 1          | 2              |
| 5      |  | Simazine (900g/kg)  | 825                   | 5             | 6       | 2         | 1         | 1       | 1     | 1     | 1          | 1      | 1      | 3             | 1          | 4              |
| 6      |  | Diuron (900g/kg)+Simazine (900g/kg)                               | 410 + 410             | 5             | 6       | 2         | 1         | 1       | 1     | 1     | 1          | 1      | 1      | 3             | 3          | 4              |
| 7      |  | Metribuzin (750g/kg)  | 280                   | 4             | 5       | 2         | 1         | 1       | 2     | 2     | 1          | 1      | 1      | 6             | 4          | 6              |
| 8      |  | Metribuzin (750g/kg)  | 420                   | 5             | 6       | 2         | 2         | 2       | 2     | 3     | 1          | 1      | 1      | 6             | 4          | 6              |
| 9      |  | Terbyne (750g/kg)   | 1000                  | 6             | 6       | 5         | 1         | 1       | 1     | 1     | 1          | 1      | 1      | 6             | 1          | 5              |
| 10     |  | Terbyne (750g/kg)   | 1500                  | 6             | 6       | 6         | 1         | 2       | 1     | 1     | 1          | 1      | 1      | 6             | 3          | 6              |
| 11     |  | Spinnaker (700g/kg)   | 100                   | 3             | 1       | 1         | 1         | 5       | 1     | 1     | 1          | 1      | 1      | 1             | 6          | 6              |
| 12     |  | Spinnaker (700g/kg) + Simazine (900g/kg)                          | 40 + 550              | 3             | 4       | 2         | 1         | 2       | 1     | 1     | 1          | 1      | 1      | 2             | 6          | 6              |
| 13     |  | Balance (750g/kg)   | 100                   | 6             | 6       | 6         | 5         | 5       | 3     | 3     | 1          | 2      | 2      | 6             | 5          | 5              |
| 14     |  | Balance (750g/kg) + Simazine (900g/kg)                            | 100 + 550             | 6             | 6       | 6         | 5         | 5       | 3     | 3     | 1          | 2      | 2      | 5             | 5          | 5              |
| 15     | 3-4 Node 14/07/2016                        | NIL   |                       | 1             | 1       | 1         | 1         | 1       | 1     | 1     | 1          | 1      | 1      | 1             | 1          |                |
| 16     |  | Simazine (900g/kg)  | 850                   | 3             | 5       | 3         | 2         | 2       | 2     | 2     | 1          | 1      | 1      | 4             | 1          | 3              |
| 17     |  | Metribuzin (750g/kg)  | 280                   | 1             | 6       | 5         | 4         | 4       | 5     | 5     | 2          | 2      | 3      | 6             | 3          | 6              |
| 18     |  | Broadstrike (800g/kg) + wetter                                    | 25/ 0.2%              | 2             | 3       | 1         | 2         | 2       | 4     | 5     | 2          | 1      | 3      | 1             | 5          | 5              |
| 19     |  | Brodal Options (500g/L)   | 150                   | 6             | 4       | 4         | 2         | 2       | 3     | 3     | 4          | 2      | 3      | 5             | 5          | 4              |
| 20     |  | Brodal Options (500g/L) + MCPA Amine (Dimethylamine Salt)(750g/L) | 150 + 100             | 5             | 4       | 4         | 3         | 3       | 4     | 4     | 4          | 2      | 4      | 6             | 5          | 5              |
| 21     |  | Spinnaker (700g/kg) + wetter                                      | 70/ 0.2%              | 2             | 3       | 1         | 1         | 5       | 2     | 1     | 3          | 2      | 1      | 3             | 6          | 6              |
| 22     |  | Raptor (700g/kg) + wetter   | 45/ 0.2%              | 1             | 3       | 1         | 1         | 5       | 1     | 1     | 2          | 1      | 2      | 1             | 6          | 5              |
| 23     |  | Ecopar (20g/L)  | 800                   | 1             | 2       | 1         | 3         | 3       | 2     | 2     | 2          | 2      | 2      | 2             | 3          | 2              |
| 24     | 5-6 Node 04/08/2016                        | NIL   |                       | 1             | 1       | 1         | 1         | 1       | 1     | 1     | 1          | 1      | 1      | 1             | 1          |                |
| 25     |  | Ally + wetter   | 7/ 0.1%               | 6             | 6       | 5         | 5         | 6       | 4     | 6     | 6          | 6      | 6      | 4             | 6          | 6              |
| 26     |  | Eclipse SC + wetter   | 50/ 0.1%              | 4             | 6       | 5         | 5         | 6       | 6     | 5     | 5          | 5      | 5      | 4             | 6          | 6              |
| 27     |  | Ecopar + MCPA Amine (Dimethylamine Salt)(750g/L)                  | 400 + 330             | 4             | 4       | 4         | 4         | 4       | 4     | 4     | 4          | 3      | 4      | 5             | 5          | 5              |
| 28     |  | Carfentrazone + MCPA Amine (Dimethylamine Salt)(750g/L)           | 100 + 330             | 4             | 5       | 5         | 4         | 5       | 4     | 4     | 5          | 4      | 4      | 6             | 6          | 6              |
| 29     |  | Vortex + Uptake   | 820/ 0.5%             | 6             | 6       | 5         | 6         | 6       | 6     | 6     | 6          | 6      | 6      | 6             | 6          | 6              |
| 30     |  | Paradigm + Uptake   | 25/ 0.5%              | 6             | 6       | 6         | 6         | 6       | 6     | 6     | 6          | 6      | 6      | 4             | 6          | 6              |
| 31     |  | Igran   | 650                   | 1             | 1       | 1         | 2         | 2       | 3     | 2     | 3          | 1      | 2      | 4             | 1          | 3              |
| 32     |  | Precept + Uptake  | 1000/ 0.5%            | 5             | 5       | 5         | 6         | 6       | 4     | 5     | 4          | 5      | 5      | 6             | 6          | 6              |
| 33     |  | Velocity + Uptake   | 670/ 0.5%             | 5             | 6       | 5         | 5         | 5       | 5     | 5     | 4          | 6      | 5      | 6             | 6          | 6              |
| 34     |  | Talinor + Hasten  | 750/ 0.5%             | 6             | 6       | 6         | 6         | 6       | 6     | 5     | 5          | 6      | 6      | 6             | 6          | 6              |
| 35     |  | Flight  | 720                   | 5             | 3       | 4         | 5         | 5       | 5     | 5     | 5          | 3      | 5      | 6             | 6          | 6              |
| 36     |  | Triathlon   | 1000                  | 5             | 3       | 4         | 5         | 5       | 5     | 4     | 5          | 3      | 5      | 6             | 6          | 6              |
| 37     |  | Banvel M  | 1000                  | 5             | 5       | 5         | 6         | 6       | 6     | 5     | 5          | 5      | 5      | 6             | 5          | 5              |
| 38     |  | Intervix + Hasten   | 600/ 1.0%             | 4             | 5       | 1         | 1         | 5       | 3     | 3     | 5          | 4      | 3      | 1             | 6          | 6              |
| 39     |  | Hussar OD + wetter  | 100/ 0.25%            | 5             | 6       | 5         | 5         | 6       | 6     | 6     | 5          | 6      | 6      | 2             | 6          | 6              |
| 40     |  | Rexaid + wetter   | 100/ 0.25%            | 4             | 6       | 5         | 5         | 6       | 6     | 6     | 5          | 5      | 6      | 1             | 6          | 6              |
| 41     |  | Atlantis OD + Hasten  | 330/ 0.5%             | 6             | 6       | 5         | 3         | 5       | 6     | 6     | 5          | 5      | 5      | 1             | 6          | 6              |
| 42     |  | Atrazine (900gai) + Hasten  | 833/ 1.0%             | 3             | 6       | 4         | 4         | 4       | 3     | 3     | 5          | 3      | 3      | 5             | 1          | 5              |
| 43     |  | Lontrel Advance   | 150                   | 6             | 6       | 6         | 6         | 6       | 6     | 6     | 6          | 6      | 6      | 1             | 1          | 1              |
| 44     |  | Starane Advance   | 330                   | 1             | 3       | 4         | 6         | 6       | 6     | 5     | 6          | 6      | 4      | 4             | 4          | 4              |
| 45     |  | Pixaro  | 300                   | 5             | 6       | 6         | 6         | 6       | 6     | 6     | 6          | 6      | 5      | 3             | 3          | 3              |
| 46     |  | 8-9 node 25/08/2016   | MCPA Sodium (250 g/L) | 700           | 1       | 4         | 1         | 2       | 2     | 2     | 1          | 2      | 1      | 2             | 2          | 1              |
| 47     | MCPA Amine (750 g/L)                       |   | 350                   | 2             | 2       | 1         | 3         | 2       | 3     | 3     | 3          | 2      | 4      | 4             | 4          | 2              |
| 48     | Amicide Advance 700                        |   | 1200                  | 5             | 4       | 4         | 5         | 4       | 5     | 6     | 6          | 4      | 6      | 6             | 6          | 4              |
| 49     | 2,4-D Ester (680 g/L)                      |   | 70                    | 2             | 1       | 1         | 1         | 2       | 2     | 2     | 3          | 2      | 3      | 2             | 1          | 1              |
| 50     | NIL  |   |                       | 1             | 1       | 1         | 1         | 1       | 1     | 1     | 1          | 1      | 1      | 1             | 1          | 1              |
| 51     | Sprayseed                                  |   | 2000                  | 3             | 5       | 4         | 6         | 6       | 5     | 3     | 6          | 6      | 5      | 6             | 6          | 6              |
| 52     | Gramoxone                                  |   | 1000                  | 2             | 4       | 2         | 4         | 5       | 4     | 2     | 3          | 6      | 4      | 4             | 5          | 5              |
| 53     | Gramoxone B-power + wetter                 |   | 2400                  | 4             | 5       | 6         | 6         | 6       | 6     | 5     | 6          | 6      | 5      | 6             | 6          | 6              |
| 54     | Glyphosate (540 g/L)                       |   | 1000                  | 2             | 5       | 4         | 5         | 5       | 3     | 1     | 4          | 5      | 3      | 5             | 6          | 5              |
| 55     | Glyphosate (540 g/L) + Terrain             |   | 1000 + 30             | 3             | 4       | 5         | 5         | 5       | 3     | 2     | 6          | 6      | 4      | 5             | 5          | 5              |
| 56     | Glyphosate (540 g/L) + Ecopar              |   | 1000 + 150            | 3             | 4       | 6         | 5         | 5       | 4     | 1     | 5          | 6      | 3      | 5             | 5          | 5              |
| 57     | Glyphosate (540 g/L) + Goal (or Cavalier)  |   | 1000 + 75             | 2             | 3       | 5         | 5         | 6       | 4     | 2     | 5          | 6      | 3      | 5             | 6          | 5              |
| 58     | Glyphosate (540 g/L) + Hammer              |   | 1000 + 50             | 3             | 4       | 5         | 6         | 6       | 4     | 2     | 5          | 6      | 4      | 5             | 5          | 5              |
| 59     | Glyphosate (540 g/L) + Amicide Advance 700 |   | 1000 + 650            | 5             | 5       | 6         | 5         | 6       | 5     | 6     | 6          | 6      | 5      | 6             | 6          | 6              |
| 60     | Glyphosate (540 g/L) + Dicamba             |   | 1000 + 240            | 5             | 6       | 6         | 6         | 6       | 6     | 6     | 6          | 6      | 6      | 3             | 4          | 4              |

