

Evaluation of herbicide tolerant canola varieties



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Take home messages

- The performance of the canola varieties evaluated in this study indicates that this crop is a viable option for inclusion as a non-cereal break crop in northern Wimmera and southern Mallee rotations.

Background

Below average growing season rainfall over the last decade has reduced grower confidence in the use of non-cereal crop options in cropping rotations. Therefore, the frequency of cereal crops, primarily wheat, across the Wimmera and Mallee regions has continued to increase. A consequence of the focus on wheat production is the reduced diversity of cropping systems where there is an increased risk of weed, pest and disease problems and reduced options for controlling these problems.

Aim

To compare the productivity of herbicide tolerant canola varieties grown in the southern Mallee and northern Wimmera environments.

Method

The suitability for production of 21 herbicide tolerant and susceptible canola cultivars was assessed at 2 sites, Woomelang and St Arnaud. Seeding rates for all lines were adjusted to meet a target establishment plant density of 50 plants/m² and planted at a depth of 2 – 3 cm between the rows of the previous season's wheat stubble. Regardless of maturity, all lines were sown and harvested on the same dates.

The following herbicide treatments were applied at both sites:

- Immediately prior to sowing, Gesaprim (900 g/kg) at 1.1 kg/ha was applied to plots to be planted with the triazine tolerant lines and was subsequently incorporated by sowing.
- At the 4 – 6 leaf stage of canola, Roundup Ready (glyphosate 600g/kg) at 0.9kg/ha, Gesaprim (atrazine 900g/kg) at 1.1kg/ha plus 1.0% Hasten crop oil, Intervix (imazamox 33g/L + Imazapyr 15g/L) at 750mL/ha plus 0.5% Hasten were applied to the Roundup Ready, triazine tolerant and imi-tolerant lines respectively. Select (clethodim 240g/L) at 500mL/ha was applied to the Roundup susceptible varieties.

Location:	Woomelang and St Arnaud
Replicates:	3
Sowing date:	13 May 2009 (Woomelang), 28 May 2009 (St Arnaud)
Seeding density:	50 plants/m ²
Crop type/s:	Canola varieties (see table 1)
Seeding equipment:	Knife points and press wheels, 30cm row spacing
Weed control:	As per above for herbicide tolerant lines and grass weed control in susceptible lines. There were no broad leaf weeds at either the Woomelang or St Arnaud sites.

Results

There were very few if any differences for any of the parameters measured between canola varieties evaluated at either the Woomelang or St Arnaud sites. At both sites there were only a few differences between canola lines in emergence counts, dry matter production and grain yield. Additionally, the differences that were observed were not consistent across both sites. The highly variable data, an inherent issue in canola plot trials, contributed to these results.

On the heavier soils at St Arnaud, canola yields were generally lower than those recorded on the lighter soils at Woomelang. This is despite the production of consistently much higher mid-flowering biomass levels for canola cultivars grown at St Arnaud. The dry finish to the season is likely to have prevented the conversion of this biomass into yield.

Table 1. Plant establishment, dry matter production and grain yield of herbicide tolerant and susceptible canola varieties grown at Woomelang and St Arnaud.

Variety and type	Maturity	Herbicide tolerance	Woomelang			St Arnaud		
			Emergence (plants/m ²)	Dry matter (t/ha)	Yield (t/ha)	Emergence (plants/m ²)	Dry matter (t/ha)	Yield (t/ha)
GT 61 OP	early-mid	RR ⁺	33	3.2	0.7	35	4.5	0.6 (0.12)*
46Y20 hybrid	mid-late	RR	53	3.0	0.9	58	4.7	0.4 (0.14)
Eclipse RR hybrid	early-mid	RR	44	3.4	0.8	44	4.5	0.6 (0.13)
Hyola 502 hybrid	early-mid	RR	48	3.0	0.8	41	5.3	0.7 (0.08)
Hyola 601 hybrid	mid-late	RR	50	3.0	0.7	43	5.3	0.4 (0.1)
43C80	early	CL	37	2.2	0.9	48	5.1	0.7 (0.07)
44C79	early-mid	CL	57	3.2	0.8	44	4.3	0.6 (0.06)
45Y77 hybrid	early-mid	CL	49	3.2	0.9	35	4.8	0.5 (0.05)
46Y78 hybrid	mid-late	CL	47	3.2	0.7	37	5.0	0.5 (0.12)
Hyola 571	early-mid	CL	48	2.4	0.9	56	4.9	0.5 (0.18)
06N7851 hybrid	early-mid	CL	42	2.4	0.6	44	5.4	0.7 (0.13)
Argyle	mid	TT	43	2.6	0.8	37	3.5	0.8 (0.01)
Boomer	early	TT	33	2.4	0.8	48	3.7	0.7 (0.03)
Cobbler	early	TT	41	2.6	1.0	27	4.2	0.8 (0.03)
Jardee hybrid	mid	TT	38	2.6	1.0	41	4.2	0.6 (0.05)
Monola 77	mid	TT	59	2.4	0.8	38	4.8	0.8 (0.05)
Scaddan OP	mid	TT	44	2.6	0.9	49	4.5	0.5 (0.07)
Tanami	early	TT	43	2.6	1.2	37	4.9	0.8 (0.07)
Telfer	early	TT	35	2.8	0.9	36	5.1	0.7 (0.02)
Hyola 50	early-mid	susceptible	56	3.2	0.8	58	4.1	0.8 (0.08)
Hyola 76	mid-long	susceptible	32	3.0	0.9	44	5.5	0.7 (0.13)
LSD (P=0.05)			25	1.0	0.3	9	1.7	0.4

+ RR, CL and TT denote Roundup Ready, Imi-tolerant and triazine tolerant respectively

* numbers in brackets are estimated yield loss due to shattering

Interpretation

There were few production differences between canola varieties grown at either the Woomelang or St Arnaud sites in 2009. These studies in general did not identify production effects due to herbicide tolerance. There were also no differences between effects regardless of maturity, herbicide tolerance or breeding system.

Acknowledgments

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