

A comparison of Roundup Ready[®], Clearfield[®] and triazine tolerant canola systems, Skipton, Victoria 2010

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ABSTRACT

Roundup Ready canola has been commercially grown in Australia since 2008, during last 3 seasons the area of Roundup Ready canola has grown from 9,600 ha to more than 141,000 ha planted in 2011.. This increase has been driven both by increased uptake in Victoria and New South Wales and also by the addition in 2010 of commercial plantings in Western Australia. Roundup Ready canola performance in terms of yield and weed control has been affected by seasonal conditions however overall weed control has been strong and yield has been around 15% higher than that of the Triazine Tolerant system, the most common alternative. In addition to the commercial production of Roundup Ready canola, during the 2010 season a replicated trial was conducted comparing the system performance of three herbicide tolerant canola systems (Roundup Ready canola, Triazine Tolerant and Clearfield). The trial was conducted using sown annual ryegrass to simulate high weed pressure as annual ryegrass is the most prevalent weed targeted in canola production systems. The trial was designed with a high level of ryegrass pressure to demonstrate weed control and its effect on yield. Roundup Ready canola and Clearfield yielded more than 25% higher than the Triazine Tolerant system, but were not different to each other.

Key words: Glyphosate – herbicide resistance – GMO

INTRODUCTION

Canola is an important part of the crop rotation in the Southern Australian farming system where weed competition is one of the key constraints on the system. Roundup Ready canola which provides growers the option of applying Roundup Ready herbicide over the top of the crop for weed control was first grown in Australia during the 2008 season in New South Wales and Victoria. The introduction followed the lifting of the State government moratorium that had delayed its Australian launch. The commercial launch in Western Australia was in 2010 following trial plantings in the 2009 season. The area of Roundup Ready canola has increased from 9,600 ha at its launch in 2008 to 141,000 ha sown this season (2011).

In the 2010 season Monsanto investigated the weed control and yield potential of the three different herbicide tolerant canola systems available in Australia (Roundup Ready, Clearfield and Triazine Tolerant). The trial was designed to evaluate the performance of herbicide tolerant canola's at a systems level, as opposed to comparing varietal performance. These systems trials were conducted under weed pressure with sown ryegrass used as the model weed. The aim was to compare the yield and level of weed control of the systems.

MATERIALS AND METHODS

The trial was conducted at Skipton in Victoria during the 2010 canola season. Representative varieties for the region from all canola systems were selected with 3 Roundup Ready varieties (Hyola 601RR, Pioneer 46Y20 and GT Mustang), 2 Clearfield varieties (Pioneer 46Y78 and Hyola 571CL) and 2 Triazine tolerant varieties (ATR Marlin and ATR Tawriffic) being grown in 6 x10 meter plots with 4 replicates.

Annual ryegrass was sown as a competing weed species with a target population of 250 plants per square meter. The Ryegrass was commercial seed planted at the time of sowing of the canola plots.

The plots received applications of herbicides to achieve weed control specific to each herbicide tolerant system:-

- Roundup Ready varieties received 2 applications of Roundup Ready Herbicide @ 0.9 kg/Ha, the first at the 2 leaf stage followed by an application at the 6 leaf stage.
- Clearfield varieties received Intervix® @ 600 mL/Ha + Hasten™ @ 0.5% + Select® @ 250 ml/Ha at the 2 leaf stage.
- Triazine Tolerant varieties received a pre sowing application of Simazine 900 @ 1.1Kg/Ha followed by Atrazine 900 @ 1.1 Kg/Ha + Hasten @ 0.5 % + Select @ 250 ml/ha and 1.0% Liase at 2 leaf stage.

Weed control was assessed with visual weed counts of plants 14 -21 days after the 2 and 6 leaf herbicide applications and a panicle count prior to harvest. Yield was assessed with mechanical harvest at maturity.

RESULTS

Weed counts (Table 1) in the treated Triazine Tolerant plots were significantly lower in the first counts taken on the 16/7/10 than the Roundup Ready and Clearfield systems due to the pre emergent application on Simazine 900 providing early weed control. There was no significant difference between the three herbicide systems at the weed count taken on the 16/8/10 or in the final panicle counts taken at the 24/11/10 however the Roundup Ready system showed complete weed control at the end of the season, while the other herbicide tolerant systems both had weed survivors setting seed.

Table 1. Weed control of the herbicide tolerant canola systems.

Variety	Herbicide Treatment	Mean Number of Ryegrass/m ²		No Panicles/m ²
		16.7.2010	16.8.2010	24.11.2010
GT MUSTANG	Untreated	124.2 b	71.7 bc	275.0 b
GT MUSTANG	0.9 kg/Ha Roundup Ready Herbicide at 2 and 6 leaf	105.0 b	1.7 a	0.0 a
HYOLA 404 RR	Untreated	128.3 b	84.2 bcd	210.0 b
HYOLA 404 RR	0.9 kg/Ha Roundup Ready Herbicide at 2 and 6 leaf	115.8 b	0.0 a	0.0 a
46Y20 RR	Untreated	113.3 b	83.3 bcd	395.0 b
46Y20 RR	0.9 kg/Ha Roundup Ready Herbicide at 2 and 6 leaf	109.2 b	3.3 a	0.0 a
HYOLA 676 CL	Untreated	135.8 b	75.0 bc	242.5 b
HYOLA 676 CL	600 mL/Ha Intervix® + 0.5% Hasten™ + 250 ml/Ha Select® at the 2 leaf	57.5 b	18.3 a	7.5 a
46Y83 CL	Untreated	117.5 b	65.8 bc	252.5 b
46Y83 CL	600 mL/Ha Intervix® + 0.5% Hasten™ + 250 ml/Ha Select® at the 2 leaf	60.0 b	5.4 a	17.5 a
HYOLA 2522 TT	Untreated	114.2 b	90.8 cd	377.5 b
HYOLA 2522 TT	1.1Kg/Ha Simazine 900 pre sowing + 1.1 Kg/Ha by Atrazine 900 + 0.5% Hasten™ + 250 ml/Ha Select® + 1.0% Liase at the 2 leaf	18.3 a	2.5 a	12.5 a
MARLIN TT	Untreated	111.7 b	70.0 b	345.0 b
MARLIN TT	1.1Kg/Ha Simazine 900 pre sowing + 1.1 Kg/Ha by Atrazine 900 + 0.5% Hasten™ + 250 ml/Ha Select® + 1.0% Liase at the 2 leaf	15.8 a	1.7 a	2.5 a
F Probability		<.001	<.001	<0.001
LSD 5 %		32.30	22.40	106.660

Although there was no significant difference in yield, Roundup Ready and Clearfield canola had a yield approximately 25% higher than the Triazine Tolerant system (Figure 2).

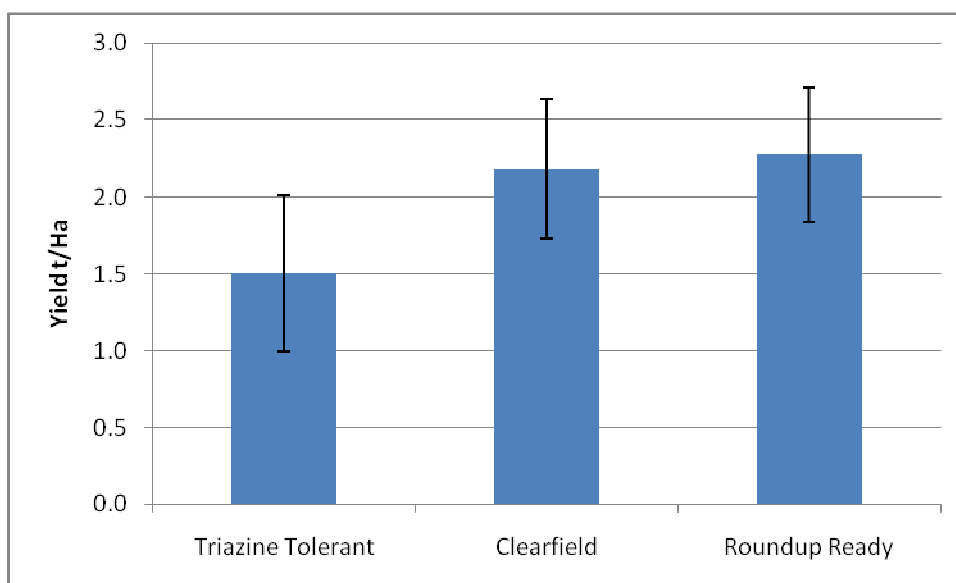


Figure 2. Average yield of the 3 herbicide tolerant systems (N=2).

DISCUSSION

Commercial data (not presented) shows that ryegrass is the key weed growers are targeting using Roundup Ready canola with it being identified in over 85% of fields. The weed control results from this trial have shown Roundup Ready canola provided complete control of the sown target weed species of annual ryegrass. The weed control achieved demonstrates the Roundup Ready system has a good fit in the Southern Australian farming system where weed control in the rotation is extremely important.

While not significant in this trial, the Clearfield and Roundup Ready canola yield results were higher than that of Triazine Tolerant canola which is consistent with results from National Variety Trials and seed company trials in 2009 and 2010.

Roundup Ready canola is an important alternative to Clearfield and Triazine Tolerant canola particularly where there are significant issues with Group A and Group B herbicide resistance.

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