3.4.2 Canola variety trial - Lake Bolac, Vic

Location: SFS Lake Bolac Research Site

Funding:
This was an SFS Streatham Branch Funded Trial

Researcher(s):
Southern Farming Systems

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Thanks to Neil Vallance for providing the land for this trial.

Summary of findings:

- 2011 proved to be a high yielding year for Canola. The site mean from this trial was 3.47 t/ha.
- The Roundup Ready varieties performed particularly well with 6 of the 7 cultivars yielding above the site mean. Of these, 45Y21 RR was the top performer and achieved the highest yield from the trial at 4.41 t/ha, 127% of site mean.
- Crusher TT & Thumper TT (103% of site mean), Hyola 575 CF (106% of site mean) and Garnet Conv. (120% of site mean) were the top performing lines within their respective canola category.
- Oil content was generally high in 2011. The mean oil content from this trial was 46.1 %.

Background/Aim:
To evaluate a range of commercially available varieties. These reflect the most widely grown varieties in the area and include others that may be considered in the future. They include a number of different grades, reflecting market options in Southern Victoria.

Rainfall:

2011 Total:	595 mm
Avg. Annual:	540 mm
2011 G.S.R.:	347 mm
Avg. G.S.R.:	400 mm

Paddock History:

2009:	Barley
2010:	Wheat

Soil Characteristics:

Soil Type:	Brown clay loam
pH (1:5 CaCl):	6.8
Deep N (kg/ha):	56.9
P (Colwell) (mg/kg):	42
K (Colwell) (mg/kg):	350
Organic Carbon %:	2

Yield Potential: The Water Limited Yield Potential (WLYP) for this trial was 2.98 t/ha.

*WLYP: Calculated using WUE values of 15kg/ha per mm rainfall for Wheat/Barley and 7kg/ha per mm rainfall for Canola, 130mm assumed evaporation and GSR of 30% Jan & Feb + 50% Mar (only if >20mm) + April to November. This calculation makes an allowance for a % of stored moisture from the summer

Variety: Various

Sowing rate: Aiming to establish 60 plants/m^2

Sowing date: 5-May-11

Plot size: 10m x 1.45m x 4 reps.

Plot type: Flat

Measurements: Cultivar yield is the primary component to be measured in this trial; however oil and test weight have also been measured in line with commercial practices.

Tillage type: The trial was sown with the SFS cone seeder on 20cm row spacing's using 2.5cm knifepoints. Stubble burnt prior to sowing.

Disease: Blackleg was seen early on in the season during the wet conditions. Effective control methods and the season drying out resulted in the disease being kept at low levels.
Slugs provided a challenge to establishment across the region and this was no different at the trial site. Populations were monitored and controlled through two applications of slug pellets during the early phases of crop development.

Table1. Dates and rates of chemical applications to canola varieties at Lake Bolac

	Clearfield	*Triazine Tolerant*	*Roundup Ready*	*Conventional*
Fertiliser	**4-May-11** MAP 100kg/ha **23-Aug-11** Urea 150kg/ha	**4-May-11** MAP 100kg/ha	**4-May-11** MAP 100kg/ha	**4-May-11** MAP 100kg/ha **23-Aug-11** Urea 150kg/ha
Herbicide	**4-May-11** Trifluralin 3L/ha, Roundup DST 2L/ha **6-May-11** Dual Gold 300ml/ha **9-Jun-11** Liase 1L/ha, Intervix 600ml/ha, Hasten 500ml/ha **27-Jul-11** Select 500ml/ha, Hasten 1L/ha **29-Jun-11** Lontrel 300ml/ha	**4-May-11** Trifluralin 3L/ha, Roundup DST 2L/ha **6-May-11** Dual Gold 300ml/ha **9-Jun-11** Liase 1L/ha, Atrazine 900Wg 1.5kg/ha, Hasten 1L/ha **29-Jun-11** Lontrel 300ml/ha	**4-May-11** Trifluralin 3L/ha, Roundup DST 2L/ha **6-May-11** Dual Gold 300L/ha **9-Jun-11** Liase 1L/ha, Roundup Ready 900ml/ha **3-Aug-11** Liase 1L/ha, Roundup Ready 900g/ha	**4-May-11** Trifluralin 3L/ha, Roundup DST 2L/ha **6-May-11** Dual Gold 300ml/ha **17-Jun-11** Select 500ml/ha, Hasten 1L/ha, Lontrel 300ml/ha **26-Jun-11** Select 500 ml/ha, Hasten 1L/ha, Lontrel 300ml/ha **29-Jun-11** Lontrel 300ml/ha
Fungicide	**27-Jun-11** Prosaro 425ml/ha, Hasten 1L/ha	**27-Jun-11** Prosaro 435ml/ha, Hasten 1L/ha	**27-Jun-11** Prosaro 435ml/ha, Hasten 1L/ha	**27-Jun-11** Prosaro 435ml/ha, Hasten 1L/ha
Insecticide	**6-May-11** Lorsban 2L/ha, Metarex 3-5kg/ha **19-May-11** Talstar 40ml/ha, Lorsban 2L/ha **10-Jun-11** Metarex 5kg/ha **29-Jun-11** LeMat 120ml/ha,	**6-May-11** Lorsban 2L/ha, Metarex 3-5kg/ha **19-May-11** Talstar 40ml/ha, Lorsban 2L/ha **10-Jun-11** Metarex 5kg/ha **29-Jun-11** LeMat 120ml/ha	**6-May-11** Lorsban 2L/ha, Metarex 3-5kg/ha **19-May-11** Talstar 40ml/ha, Lorsban 2L/ha **10-Jun-11** Metarex 5kg/ha **29-Jun-11** LeMat 120ml/ha	**6-May-11** Lorsban 2L/ha, Metarex 3-5kg/ha **19-May-11** Talstar 40ml/ha, Lorsban 2L/ha **10-Jun-11** Metarex 5kg/ha **29-Jun-11** LeMat 120ml/ha

Image 1. Canola variety trial at Lake Bolac

Results and discussion:

2011 proved to be a high yielding year for Canola. The site mean from this trial was 3.47 t/ha (table 1 below). This is almost 0.5 t/ha better than at Inverleigh.

The Roundup Ready varieties attained the top mean yield of 3.68 t/ha, followed by Conventional varieties at 3.55 t/ha, Clearfield varieties at 3.37 t/ha and then Triazine Tolerant at 3.29 t/ha.

In terms of oil percentage, the site mean was 46.1%. This is 4.1% above the base level of 42% and so there would have been no deductions or rejections at receival. Given this season's market price of approximately $500/t non-GM canola, this equates to an oil premium of $30.75 ($7.5 per percentage over the base level). This is reflected in what was seen amongst broad acre growers in the region who, generally speaking, also experienced high oil contents for the 2011 canola crop.

Generally speaking the mid to earlier maturing varieties in each category performed the best in this season, in this trial. Spring time rainfall (Aug-Nov) at the trial site in 2011 was 56.7mm down against the long term average. This would have suited varieties that mature earlier rather than later.

Table 2. Yield and oil content of canola varieties.

Variety	Yield (t/ha)		% Site Mean	Oil Content (%)		Maturity
Clearfield						
Hyola 575 CF	3.69	a	106%	45.8	a	Mid
07N406I CF	3.51	ab	101%	46.3	a	
Hyola 474 CF	3.35	abc	96%	45.8	a	Mid Early
45Y82 CF	3.25	bc	94%	45.6	a	Early Mid
46Y83 CF	3.04	c	88%	46.1	a	Mid Early
LSD 5%	*0.38*			*0.8*		
CV	*7.36*					
Mean	*3.37*			*45.9*		
Roundup Ready						
45Y21 RR	4.41	a	127%	45.9	a	Mid Early
45Y22 RR	4.28	ab	123%	45.1	a	Mid Early
Hyola 505 RR	3.90	bc	112%	46.2	a	Mid Early
Hyola 404 RR	3.81	c	110%	46.2	a	Mid Early
Mustang RR	3.68	c	106%	45.6	a	Mid Late
46Y20 RR	3.50	c	101%	48.0	a	Mid
104 RR	2.19	d	63%	45.3	a	Late
LSD 5%	*0.41*			*3.2*		
CV	*7.42*					
Mean	*3.68*			*46.0*		
Triazine Tolerant						
Crusher TT	3.58	a	103%	45.3	bc	Mid
Thumper TT	3.56	ab	103%	47.1	a	Mid Late
Hyola 555 TT	3.50	ab	101%	44.9	c	Mid Early
Jardee TT	3.23	bc	93%	45.0	c	Mid
Monola 605 TT	3.09	c	89%	45.9	b	Early Mid
Hyola 751 TT	3.07	c	89%	44.7	c	Mid Late
Jackpot TT	2.98	c	86%	47.6	a	Mid Early
LSD 5%	*0.34*			*0.7*		
CV	*6.94*					
Mean	*3.29*			*45.8*		
Conventional						
Garnet Conv	4.15	a	120%	47.3	a	Mid
Hyola 433 Conv	3.96	a	114%	46.5	a	Early Mid
Hyola 50 Conv	3.30	b	95%	46.2	a	Early Mid
Taurus	2.80	c	81%	47.4	a	Late
LSD 5%	*0.43*			*1.3*		
CV	*7.63*					
Mean	*3.55*			*47.0*		
Site Mean	***3.47***			***46.1***		

Means followed by same letter do not significantly differ (P=.05, LSD)

Pioneer's hybrid Roundup Ready variety, 45Y21, was the top yielding cultivar in the trial at 4.41t/ha (table 2). All RR varieties, with the exception of 104 RR, yielded above the site mean. The late maturity of 104 RR meant it was harvested separately and this combined with the dry finish to the season at the trial site meant that it underperformed compared to the rest of the trial.

Garnet conventional canola from Nuseed continues to produce high yields in the high rainfall zone of southern Victoria. It is leader amongst the open pollinated varieties on offer and still exhibits yield gains over the hybrids in this class. Blackleg management is strongly recommended for Garnet even though it has a resistance rating of MR.
The performance of the Taurus cultivar bought the average for this class down and set amongst its hybrid neighbours, the two Hyola lines from Pacific Seeds, it compares unfavourably. However, as with 104 RR, Taurus matured late and was not harvested until 9 days after the rest of the trial. These later maturing varieties suffered from the dry spring at Lake Bolac, with below average rainfall and warm temperatures not conducive to maximising yield during the grain fill period. It is also likely that there were losses from shattering by this time and in future such late maturing lines will be grouped together amongst other later varieties for improved management.

Graph 1. Yield performance of Canola varieties, complete with site mean.

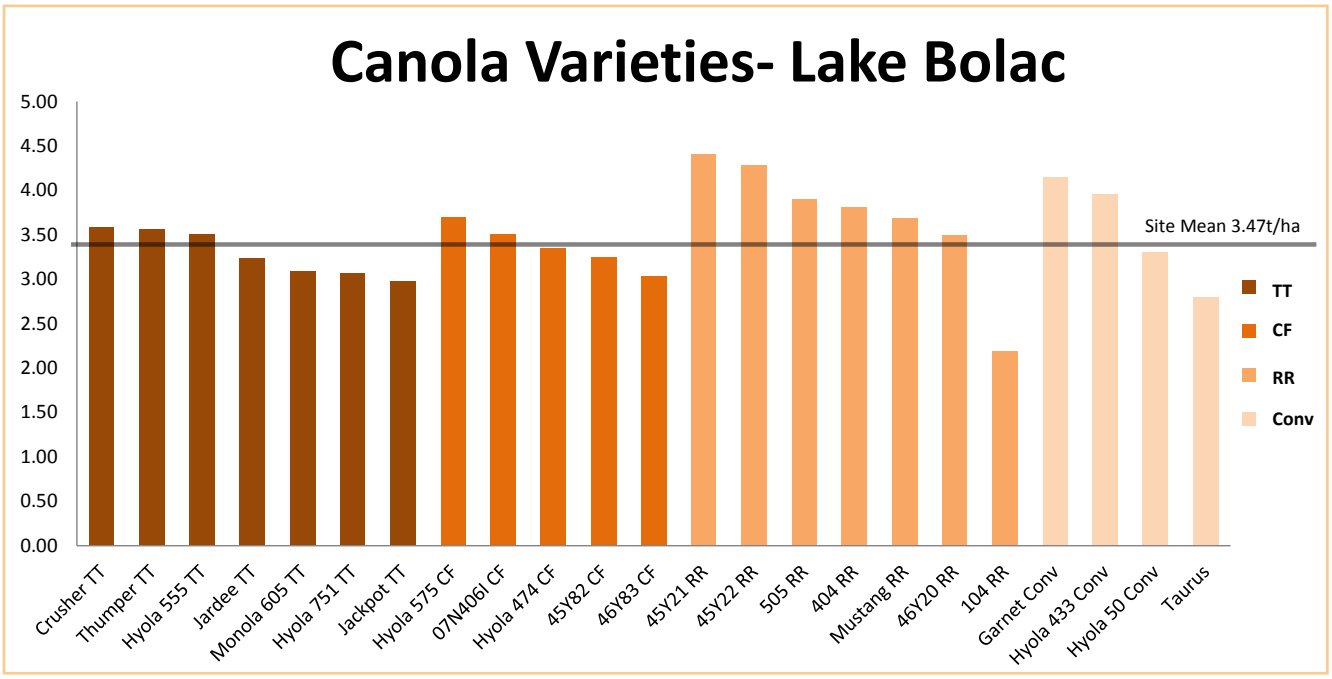
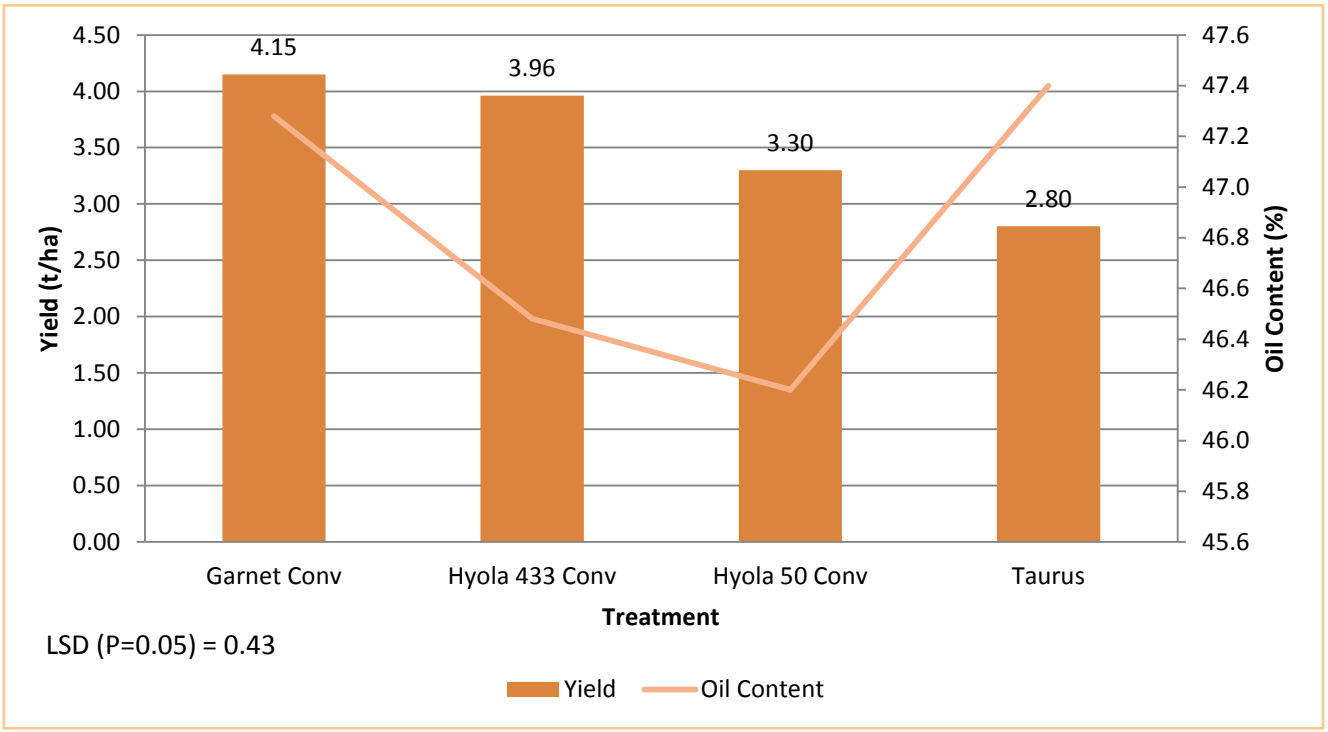


Image 2. Canola variety trial at Lake Bolac

The Pacific seeds Clearfield hybrid variety Hyola 575 topped yields in this category. This yield was significantly better than the Pioneer 45Y82 and 45Y83 CF varieties.

Across the trial, the conventional lines of canola had the highest oil content at an average of 47%. However, it was the TT varieties Jackpot & Thumper, which produced highest individual contents at 47.6% and 47.1% respectively. These were both significantly different to the 5 other TT lines in the trial. In fact, an increased oil content of 1.8% from Thumper over Crusher would make Thumper the more profitable variety in this trial. Increased oil content can make up for any decreases in yield and is worth considering alongside seed yield alone when choosing between two relatively similar varieties. This is true for all varieties across the trial.

Graph 2. Highest yielding varieties – yield difference above site mean



Graph 2, above, displays the highest performing varieties in each category when compared to the site mean yield (3.47 t/ha). This trial has shown that all of these varieties yielded above the site mean, with 45Y21 RR showing a considerable yield improvement at almost 1t/ha. This may be explained in part by the fact that the trial site has a high population of resistant ryegrass. Therefore, Roundup Ready varieties would not suffer to the same extent with yield loss caused by weed competition as other non RR varieties.

The graph also highlights the benefits of growing hybrids when coupled with herbicide tolerant technologies at a high weed pressure site. The early vigour in particular of the Roundup Ready hybrids allowed stronger plants to develop which led to quicker canopy closure than other varieties. This aided emergence and quicker growth out against pests whilst also providing in crop weed suppression. This would have ultimately been beneficial in achieving the higher yields from these varieties.