Canola variety trial 2014

Background

Over the past four years the wheat variety trial has provided a valuable benchmark for varietal performance on Kangaroo Island. In 2014 a canola variety trial was run on the Island for the first time. The trial included 8 TT varieties of hybrid and open pollinated canola.

The variety Crusher was included twice (with and without stubble). This enabled us to look at the effect of stubble on crop emergence, blackleg infection and yield. The remainder of the trial was sown into a burnt wheat stubble. Note that the whole trial site was burnt, and then reserved stubble added back to the "Crusher plus stubble" plots after sowing.

What was done

The trial was located on a well-drained site at S & W Veitch's lease property on Margries Rd. The soil was a sandy loam with good fertility. It had Colwell P of 90mg/kg, Colwell K of 170mg/kg and sulphur of 13.2mg/kg, all adequate. The soil was acidic with pH ($CaCl_2$) of 4.2.

The trial received 405mm of rain for 2014 compared to the average for the area of 600mm. The trial did not get waterlogged but suffered moisture stress at flowering/grain fill, with September - November rainfall totalling 31mm.

Trial management

The trial was sown on the 21st of May. All varieties were sown at 4kg/ha with 90kg/ha Mapstar™, providing 12 units N, 16 units P and 11 units of S per ha. At emergence the trial was treated with 1l/ha Lorsban™, 40ml/ha Talstar™ and 20kg/ha snail bait to eliminate the impact of pests on small plots. In addition to nitrogen at sowing, 110kg/ha SOA was applied on 13th July and 100kg/ha urea on 12th Aug.

The trial was a completely randomised block design with 4 replicates; this means that each variety appeared 4 times in the trial, once in each of the four blocks. Each plot was 8.5m long by 1.1m wide.

Grain yield

Statistically significant differences at the 95% confidence level can be summarised in TABLE 1. Varieties are all listed across the top in bold. The variety across the top yielded significantly higher than the varieties listed in itallics below, if any.

FIGURE 1: **Graphic comparison of average yield over four replicates.**

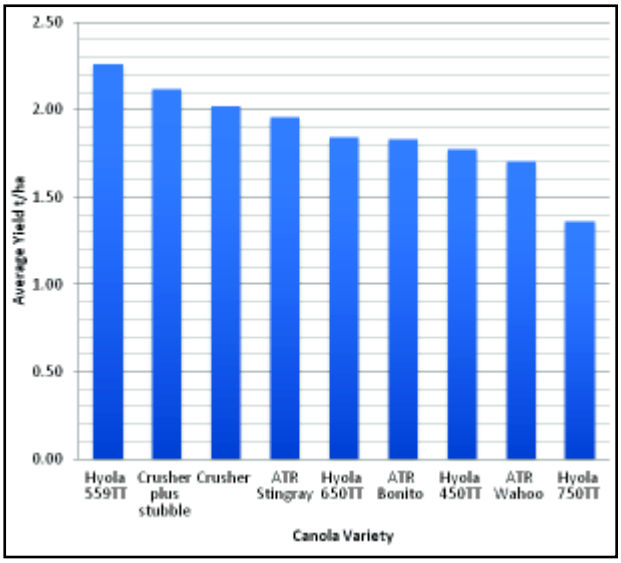


TABLE 1: **Summary statistically significant differences at 95% confidence level.**

559TT	Crusher	Stingray	650TT	Bonito	450TT	Wahoo	750TT
Crusher	*650TT*	*450TT*	*750TT*	*750TT*	*750TT*	*750TT*	
Stingray	*Bonito*	*Wahoo*					
650TT	*450TT*	*750TT*					
Bonito	*Wahoo*						
450TT	*750TT*						
Wahoo							
750TT							

Hyola® 750TT was the lowest yielding variety. Hyola® 750TT is a late season muturity while Hyola® 559TT is a midseason. The below average rainfall and dry spring would not have favoured Hyola® 750TT. Given an average season the relative performance of Hyola® 750TT may have been better. Hyola® 559TT was the best yielding variety, with yield statisitically higher than all other varieties in the trial. Crusher TT and ART Stingray performed well also and being open pollinated have the benefit of lower seed cost.

Grain quality

TABLE 2 shows oil content of the different varieties. All oils are good but there is a reasonable range from Hyola® 450TT at 44.2% to Hyola® 559TT at 47%. This accounts for $23 difference in price per tonne. Hyola® 559TT was also the higher yielding variety and had the highest oil content, putting it in a good positon for gross margin analysis.

TABLE 2: **Grain oil content**

Variety	Oil content %
ATR Bonito	46.8
ATR Stingray	46.6
ATR Wahoo	46.4
Crusher TT	44.6
Crusher TT plus stubble	44.4
Hyola® 450TT	44.2
Hyola® 559TT	47.0
Hyola® 650TT	45.3
Hyola® 750TT	45.4

Gross margin

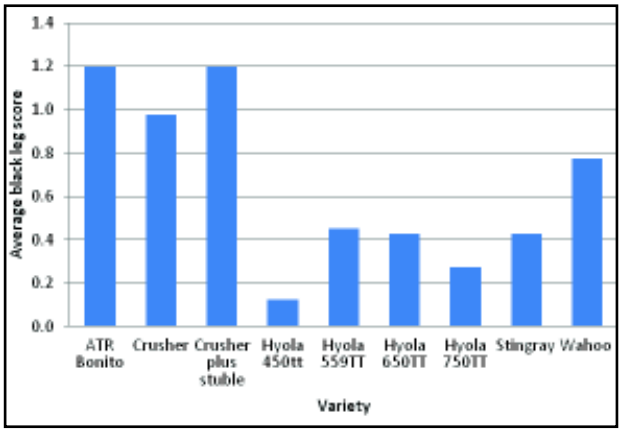
There are differences in the cost of growing the varieties due to variation in seed cost and end point royalties. Income per tonne also varies depending on oil content. For these reasons gross margin provides a better comparison of varietal performance than yield alone.

TABLE 3 shows that as a general rule varieties that yielded higher produced higher gross margin. An exception to this is Hyola® 650TT which slightly out-yielded ATR Bonito but had a gross margin of $50/ha less. This was due to higher seed cost and lower oil content of Hyola® 650TT. Hyola® 559TT had the highest gross margin and Hyola 750TT the lowest. The difference between Hyola® 559TT and Crusher TT is notable with $110 extra gross margin even when taking the extra seed costs of 559TT into consideration.

Blackleg

Blackleg scores were taken at the ideal time for windrowing on 5th of November with the assistance of Andrew Etherton. The scores were done blind (without knowing the varieties) to rule out the possiblilty of bias. We would like to thank Andrew for his assistance with this. Scores were taken from 10 stems from each plot, a total of 40 stems scored per variety. FIGURE 2 below shows average blackleg score for each variety out of 5 with 0 indicating no infection and 5 being completely dead.

FIGURE 2: **The comparison of black leg infection.**



There is a lot of variation in blackleg infection between varieties. It is interesing to note that there is no strong relationship between blackleg infection and variety yield, meaning that blackleg infection was not a good predictor of yield for the varieties in this trial (relationship not published in this report).

TABLE 3: **Seed cost, end point royalties, gross income and gross margin per ha.**

Variety	Seed Cost/ha#	End Point Royalty Cost/ha	Average yield (t/ha)	On-farm value/t inc. oil bonus	Gross income/ha*	Gross margin/ha^
ATR Bonito	$4	$9	1.83	$476	$870	$357
ATR Stingray	$4	$0	1.96	$476	$933	$429
ATR Wahoo	$4	$9	1.70	$476	$811	$299
Crusher TT	$4	$0	2.02	$461	$930	$426
Crusher TT plus stubble	$4	$0	2.12	$461	$976	$472
Hyola® 450TT	$57	$0	1.78	$461	$818	$261
Hyola® 559TT	$57	$0	2.26	$484	$1,093	$536
Hyola® 650TT	$57	$0	1.84	$468	$863	$306
Hyola® 750TT	$57	$0	1.36	$468	$638	$81

* *Based on KIPG estimated pool returns on-farm Feb 2015 less storage and handling, less freight to mainland, less freight to KIPG silo ($445/t). Oil bonus is included where appropriate.*

^ *Gross margin based on cost of $500 per ha to grow crop excluding seed and end point royalty.*

\# *seed cost assumes retained seed at $1000/t and hybrid seed purchased at $28.50/kg.*

This might indicate that blackleg infection levels were too low to have a significant impact on yield. The long term effect of increased blackleg infection also needs to be considered. The variation in blackleg infection indicates that variety selection can be a valuable tool for blackleg management on the Island.

For more detail on blackleg infection, strains on the Island and implications, please see blackleg report written by Andrew Etheron of Pacific Seed in this Trial Booklet. Note; that both seed companies have been provided with the opportunity to interpret the results.

Seed treatment

All seed was treated with either Jockey™ (Fluquinconazole) or Maxim™ (Fludioxonil + metalaxyl) with the only exception being Hyola® 750TT which had no treatment. This was not ideal but was due to the late availability of seed. Although Hyola® 750TT had no fungicide at sowing and was the lowest yielding, but it had the second lowest blackleg score indicating Blackleg infection was not likely the cause of its lower yield. Hyola® 750TT is a long season variety, hence the poor spring rains would be a better explanation for its low relative yield.

Effect of retained stubble

The current Island standard of Crusher TT canola was included in the trial with and without stubble. Other than the addition of stubble post-sowing on day of sowing, the Crusher plus stubble treatment was treated the same as the Crusher treatment (note both plots were burnt prior to sowing). The Crusher plus stubble treatment had a higher average yield than the Crusher treatment but the difference of 100kg/ha is not statistically significant.

The impact of stubble on plant emergence was also not statistically significant. Plant densities (plants per m^2) measured on 22nd July were 96 for Crusher plus stubble, and 83 for Crusher.

When we compare blackleg scores from FIGURE 2, the Crusher plus stubble treatment had more blackleg infection than the Crusher. This is intuitive given that the retained subble contained some canola stubble from the crop two years prior to the trial. Again it is unlikely that this small difference it statistically significant.

The stubble treatment is a positive result, producing no statistically significant difference in yield, emergence or blackleg infection. It is important to remember that the whole trial site was burnt and received high rates of snail/slug bait, both not common practice in a broadacre no-till system.

Take home messages

- Longer season varieties had lowest yields in dry season.
- Hyola® 559 TT had highest yield, oil content and gross margin.
- Need to consider gross margin over yield as seed and end point royalties (EPR) costs differ.
- Range of varietal resistance to blackleg at this site.
- Addition of stubble had no impact on performance of Crusher TT.

Funding/Sponsors

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- Andrew Ware (SARDI) for statistical analysis.
- More infromation available on varieties in the SARDI Canola Variety Sowing Guide 2015.

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