# MALLEE CANOLA NVT SUMMARY

Brooke Bennett and Claire Browne (BCG)

### TAKE HOME MESSAGES

- Pioneer® 43Y29 RR, InVigor® R 4022P (RR) and InVigor® T 4510 (TT) were the highest yielding varieties in Birchip.
- Pioneer® 43Y29 RR, InVigor® R 4022P (RR) and Saintly CL were the highest yielding varieties in Hopetoun.
- New Hybrid TT varieties are consistently outperforming older OP varieties. InVigor® T 4510 outperformed ATR Stingray by an average of 0.6t/ha across the two sites.
- Hybrid TT varieties yielded as well as the best performing Clearfield varieties.

#### BACKGROUND

The area of canola grown in the southern Mallee increased in 2019 after large rainfall events over some areas in December 2018. Some growers elected to grow hybrid canola for the first time to capitalise on the yield potential. Although there was high sub-soil moisture and favourable in-season early rainfall, the season wasn't without its challenges. Canola was dry sown throughout April. The first significant rain came in early May, however good establishment in canola crops was still observed across the Mallee. Further challenges occurred late in the season, when aerial blackleg caused concern for some growers in the Southern Mallee – due to wet weather in August, combined with thick crop canopies – and there was an outbreak of native budworm (*Heliothis punctigera*). While these issues did not cause large or widespread yield losses, it prompted growers to ask if they should spray. Some canola was lost due to unfavourable weather conditions in late November, particularly in cases where windrowing had not occurred. Overall yields were positive in the southern Mallee whereas the northern Mallee experienced below average yields.

Canola variety options change regularly: eight new varieties were released and three varieties discontinued this year. There are new herbicide tolerance options such as TruFlex® and stacked herbicide tolerance, which provide alternative options for weedy paddocks and plant back following various herbicide residues. In some cases, these may not be the highest yielding varieties but do offer a different benefit. This makes comparisons over multiple seasons difficult, so investigating newer varieties each year is important.

This research was conducted through the National Variety Trial (NVT) program delivered by the Grains Research and Development Corporation (GRDC).

## AIM

To assess the performance of existing and emerging canola varieties in the Mallee GRDC funded NVT trials in 2019.

# PADDOCK DETAILS

Location:	Karyrie (near Birchip)	Hopetoun
Crop year rainfall (Nov-Oct):	418mm	310mm
GSR (Apr-Oct):	197mm	152mm
Soil type:	Clay loam	Sandy clay loam
Paddock history:	2018 Fallow	2018 Lentil
	2017 Lentil	

#### TRIAL DETAILS

Crop type:	Canola
Target plant density:	40 plants/m <sup>2</sup>
Seeding equipment:	Knife points, press wheels, 30cm row spacing
Sowing date:	Karyrie 30 April, Hopetoun 26 April
Replicates:	Three
Harvest date:	Karyrie 15 November, Hopetoun 17 November
Trial average yield:	Karyrie 2.5t/ha, Hopetoun 1.8t/ha

## **TRIAL INPUTS**

Fertiliser Birchip:	Sowing	Granulock® Supreme Z + Flutriafol (200mL/100kg) @ 60kg/ha
	24 June	Urea @ 100kg/ha
	25 July	Urea @ 100kg/ha
Fertiliser Hopetoun:	Sowing	Granulock® Supreme Z + Flutriafol (200mL/100kg) @ 60kg/ha
	19 June	Urea @ 60kg/ha
	5 Aug	Urea @ 100kg/ha

Weeds, pests and disease were controlled according to best management practice.

## METHOD

This summary was undertaken using yield data from the NVT Online website. These trials are managed to maximise genetic potential yields, rather than profitability. They receive multiple fungicide applications and are managed to ensure they are not nitrogen limited. This is to ensure there are no confounding factors when assessing the genetic potential of these varieties.

## **RESULTS AND INTERPRETATION**

#### Birchip

Favourable conditions throughout the season, after 199mm of December rainfall at Birchip, delivered a mean trial yield of 2.5t/ha (Figure 1). The trial was sown on 30 April and received substantial rainfall in the following days which was conducive to good germination and establishment.

The Roundup Ready<sup>®</sup> (RR) varieties yielded the highest in the trial averaging 2.6t/ha with Pioneer<sup>®</sup> 43Y29 RR and InVigor<sup>®</sup> R 4022P yielding 121 and 115 per cent of the site mean.

The Clearfield (CL) varieties performed well (2.5t/ha), with the top performing varieties Pioneer<sup>®</sup> 44Y90 and Saintly CL yielding 105 and 101 per cent of the site mean.

In the triazine tolerant (TT) varieties the hybrids performed similarly to the open pollinators (OP). The top performing variety was InVigor® T 4510 yielding 2.7t/ha or 112 per cent of the site mean, while the top performing OP variety was ATR Bonito yielding 2.6t/ha (106 per cent of the site mean). InVigor® T4510 is an early-mid maturing variety with a disease package suitable to the Mallee region.



The top varieties in the TT and CL herbicide groups were equal, with average yields of 2.7t/ha.

Figure 1. Grain yield results at Birchip NVT ordered by herbicide group. Herbicide groups analysed separately. Error bars show LSD (t/ha) CLF = 0.18, RR = 0.17, TT = 0.17. CV (%) CLF = 4.4, RR = 3.9, TT = 4.0.

#### Hopetoun

Hopetoun had a large amount of stored sub-soil moisture (117mm plant available water) from summer rain. That was largely responsible for the average yield of 1.8t/ha across the trial site, as in-season rainfall was below average (Decile 1 GSR).

Herbicide group performance was consistent at both sites with CL and RR herbicide groups outperforming the TT varieties at both Birchip and Hopetoun. At Hopetoun, average yields of CL and RR herbicide groups were 0.3t/ha higher than the TT varieties (Figure 2).

The top yielding varieties were also consistent between sites. The top performing CL varieties were Saintly CL and Pioneer® 44Y90, with 107 and 106 per cent of the site mean. The top RR varieties included InVigor® R 4022P and Pioneer® 43Y29 RR, with 119 and 111 per cent of the site mean.

InVigor® T 4510 and InVigor® T 3510 were the best yielding varieties of the TT herbicide group, with 120 and 107 per cent of the site mean. The hybrid varieties outperformed the OP varieties at Hopetoun, yielding 0.2t/ha more. The commonly known OP variety ATR Stingray yielded less than the site means at both trial sites (88 per cent at Birchip and 81 per cent at Hopetoun).



Figure 2. Grain yield results at Hopetoun NVT ordered by herbicide group. Error bars show LSD (t/ha) CLF = 0.14, RR = 0.14, TT = 0.14. CV (%) CLF = 4.9, RR = 4.7, TT = 5.6.

#### COMMERCIAL PRACTICE

Variability in canola yields across the Mallee is not unique to 2019, as a result, canola is often considered a high risk commodity crop. When germination opportunities and a large amount of sub-soil moisture are present, canola can be a very profitable crop. While it is an expensive commodity, it brings many rotational benefits – such as disease and weed break – which can be recouped in the following season.

With new canola varieties constantly entering the market, it can be difficult to choose a suitable variety. The decision around which variety to grow should be based on three factors: phenology response, hybrid versus OP yields and herbicide tolerance.

The phenology response of a variety is extremely important. If a variety that flowers too early is chosen, it will be exposed to a greater frost risk and higher disease risk. If sown too late, it will be at risk of heat stress. Consider choosing a variety that will flower at the right time in your environment.

There were only two OP varieties in the trial (ATR Stingray and ATR Bonito), but the value of hybrid varieties can be seen from their yield, which averaged 0.2t/ha higher than the OP varieties. An OP variety also yielding the lowest or equal lowest at both locations. Hybrid TT varieties are improving every year.

Growers also should assess the weed burden across paddocks before selecting for herbicide tolerance. TruFlex<sup>®</sup> is a new technology that extends the window for spraying RR herbicides and allows for increased rates of chemical, enabling better control of late germinating weeds. Commercially available TruFlex<sup>®</sup> canola varieties in this trial include Hyola<sup>®</sup> 410XX and InVigor<sup>®</sup> R 3520.

Grain quality information from NVT trials was not available at the time of compiling this report.

### **ON-FARM PROFITABILITY**

Yield variability across the Mallee encourages growers to favour open-pollinated varieties because of the vast savings on seed cost. OP varieties are about 10 per cent of the price of hybrid varieties, taking into account savings from retaining OP seed. However, hybrid varieties are more often higher yielding. InVigor® T 4510 was \$78/ha more profitable than the open-pollinated variety ATR Bonito (Table 1). A rule of thumb is 0.1t/ha increase in grain yield is needed to make hybrids more profitable than OP varieties.

It is important to keep updating varieties as older varieties do not have the genetic yield potential of newer varieties. The 10-year-old variety ATR Stingray was \$206/ha less profitable than ATR Bonito (released in 2013) and \$285 less profitable than InVigor® T 4510 (released in 2016).

The price received by growers is affected by oil concentration, however grain quality results for this trial were not available at the time of writing this report.

# Table 1. Partial gross margin for TT open-pollinated vs hybrid. Assumptions are ATR Bonito and ATR Stingray seed farmer retained and treated estimated cost \$5/kg and ATR Bonito with EPR of \$5/t and InVigor® T 4510 seed \$28/kg.

	InVigor® T 4510	ATR Bonito (OP)	ATR Stingray (OP)
Mean crop yield (t/ha)	2.3	2.1	1.7
Gross income (\$/ha)	1311	1186	969
Variable costs (\$/ha)	70	23	12.5
Partial gross margin (\$/ha)	1241	1163	957

#### REFERENCES

Brill R., (Ed), 2019, GRDC, '20 Tips For Profitable Canola'. https://grdc.com.au/20-tips-for-profitable-canola-south-australia

Brown S., and Harris K., 2019, 2020 Victorian Crop Sowing Guide, 2019, Agriculture Victoria, https://grdc.com.au/2020-victorian-crop-sowing-guide

GRDC National Variety Trials yield data, 2019, https://www.nvtonline.com.au/

#### ACKNOWLEDGEMENTS

This research was funded by the GRDC as part of the National Variety Trial program project (BWD00029). This summary has been funded by BCG members through their membership.