

Southern Irrigated Canola Varieties Achieving Target Yields - Hillston 2014

Barry Haskins and Rachael Whitworth – Ag Grow Agronomy and Research
Tony Napier - NSW Department of Primary Industries, Yanco

Introduction

Previous research by industry identified that there was potential to significantly increase the area and profitability of irrigated canola. Growers and researchers identified varietal suitability and decision support systems in making fertiliser and irrigation decisions as two of the key priority areas for irrigated canola.

This trial has been designed to test the regional suitability of current commercially available canola cultivars as well as to determine nitrogen application and rate recommendations for specific canola varieties. It is one of the satellite sites of the Southern Irrigated Cereal and Canola Achieving Target Yields project.

Site Details

Location:	Hillston, NSW
Soil type:	Grey clay loam
Sowing date:	23 rd April
Available N at sowing:	228 kg/ha (0-60 cm)
Previous crop:	Fallow 2013
Starter Fertiliser:	50 kg MAP (25kg pre-drilled, 25kg with seed)
Rainfall:	125 mm January–March + 163 mm April–October
Irrigation:	2 Spring Irrigations (3 ML/ha), August and September
Harvest Date:	19 th November

Treatments

12 canola varieties	Pioneer®45Y88CL, ATR-Gem, Pioneer®44Y84CL, Hyola®559TT, Pioneer®44Y87CL, Victory®V3002, Hyola®577CL, Hyola®450TT, AV-Garnet, Pioneer®43C80CL, ATR-Bonito and Hyola®50
4 nitrogen rates/timings	50 kg N/ha at sowing 100 kg N/ha at sowing 150 kg N/ha at sowing 50 kg N/ha at sowing + 50 kg N/ha topdressed

Results

An error at sowing had an effect on the randomisation of the trial. As a result there is no statistical analysis for this trial. Measurements that were taken on this trial, and included in this report, are establishment counts (plants/m²), Normalised Digital Vegetation Index (NDVI), lodging scores and grain yield (t/ha).

Establishment counts were taken on the 28th May 2014. The targeted plant establishment for this trial was 40 plants/m². Establishment varied with plant counts ranging from 26 plants/m² for the variety ATR-Gem up to 52 plants/m² for the variety 44Y87CL (Figure 1). The average establishment count was 40 plants/m². Even though nitrogen was predrilled as urea, the higher the nitrogen rate, the lower the establishment (Figure 2). There was a reduction in establishment from 47 plants/m², where no fertiliser was pre-drilled, to 35 plants/m² where 150kg N/ha was pre-drilled.

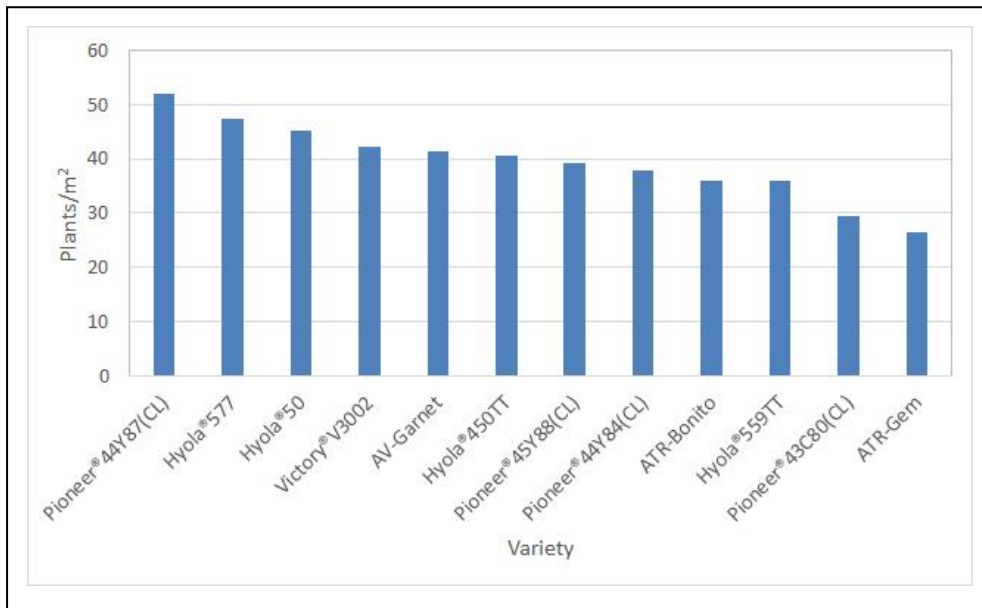


Figure 1: Canola establishment counts (plants/m²), taken 28th May, 2014.

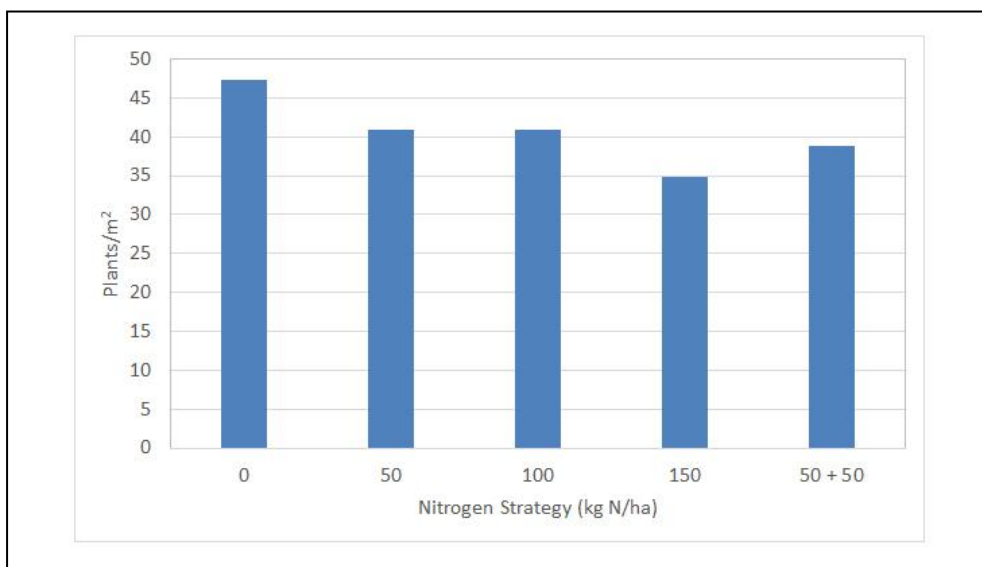


Figure 2: Canola establishment counts (plants/m²) for different nitrogen treatments (kg N/ha).

Crop vigour was measured at full ground cover on 25th June 2014 using a hand held NDVI unit. The NDVI values recorded ranged from 0.68 for the 150kg N/ha at sowing rate up to 0.78 for the 50kg N/ha at sowing rate (Figure 3). This was closely followed by the 0kg N/ha rate and the split 50+50 kg N/ha rate. These values were affected by the establishment counts as well as the rate of nitrogen applied, ie 150kg N pre-sown had lower NDVI value as a result of less plants establishing.

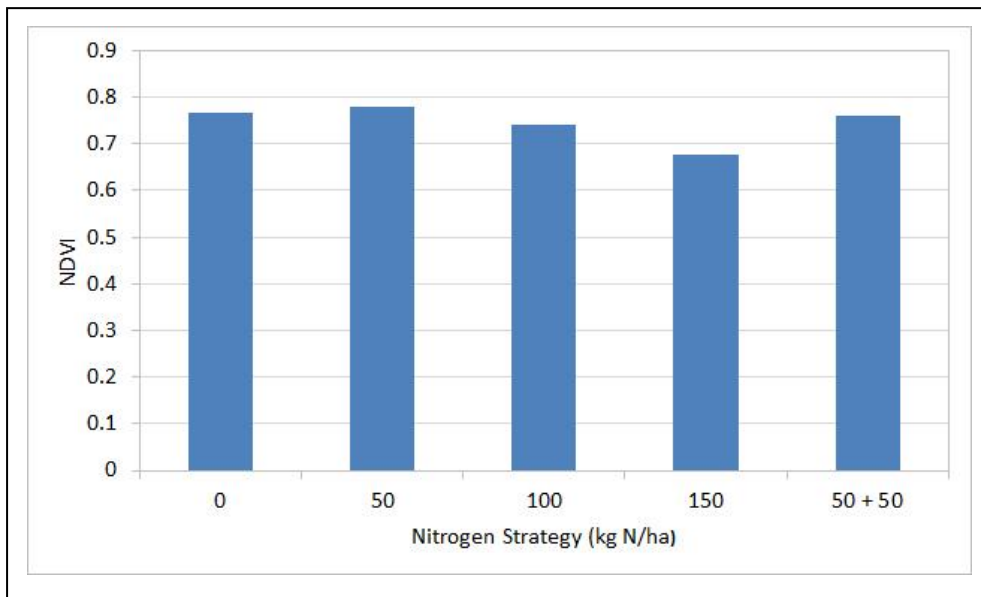


Figure 3: NDVI values for different rates of nitrogen fertiliser across all canola varieties, taken 25th June 2014

Lodging scores were taken twice in October and again at harvest. Lodging was scored on a scale of 0 to 9, with 0 indicating no lodging and 9 indicating the crop lodged flat on the ground. Hyola 450TT had the highest degree of lodging for all 3 timings, followed by 44Y84CL and 43C80CL (Figure 4). Bonito had the lowest degree of lodging for all 3 timings. Most of the other varieties had minimal lodging with scores less than 2.

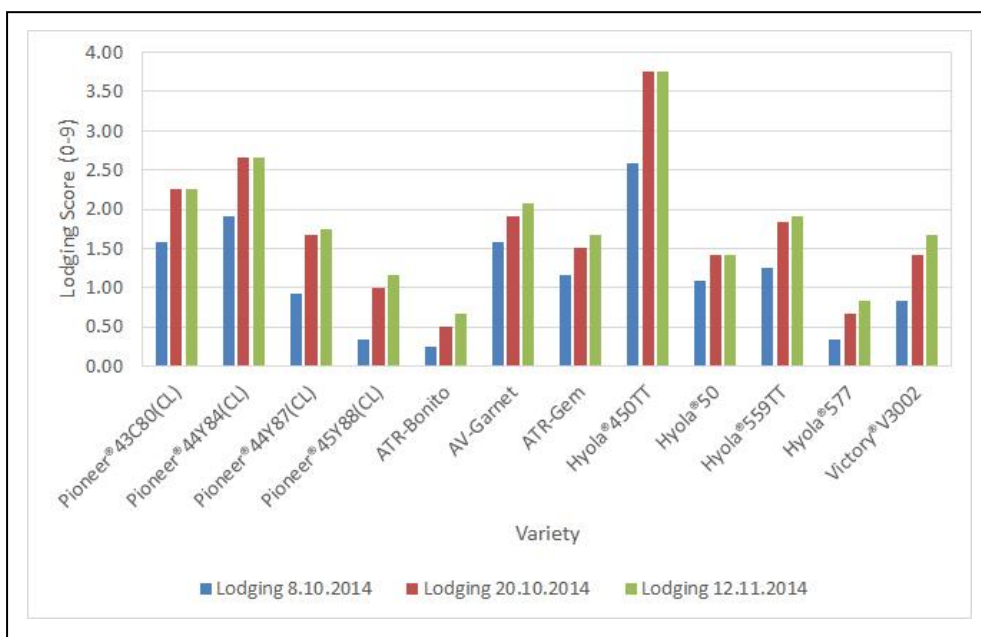


Figure 4: Lodging scores for canola varieties taken twice in October and once before harvest

Significant grain loss occurred through shattering at harvest as the trial was direct headed, and the finish to the 2014 season was extremely hot and dry, creating very dry plants. Due to the edge effect in trials, plants on the end of plots took longer to dry, which delayed harvest.

The variety Hyola 50 was the standout canola variety. Grain yield ranged from 1.83 t/ha for Bonito up to 2.92 t/ha for Hyola 50 (Figure 5). The varieties Garnet and 44Y87CL also performed well yielding over 2.5 t/ha.

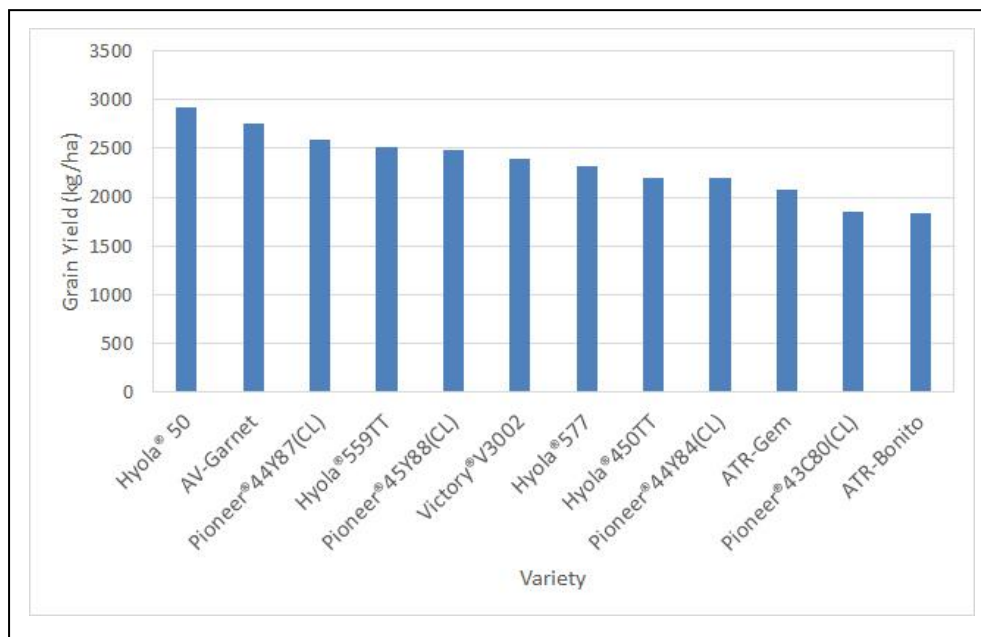


Figure 5: Yield of the canola varieties.

The highest yielding nitrogen treatment was where 100kg N/ha was applied at sowing, yielding 2.36 t/ha (Figure 6). This was closely followed by the split strategy (50kg N/ha at sowing + 50kg N/ha topdressed) yielding 2.34 t/ha. As expected, the lowest yielding nitrogen treatment was where no nitrogen was applied, yielding 1.9 t/ha.

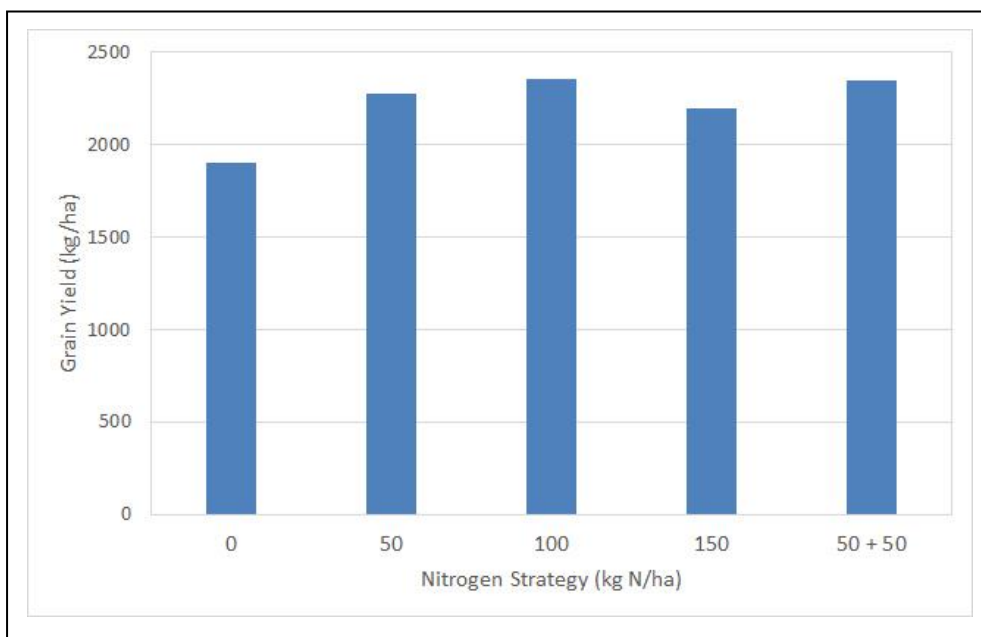


Figure 6: Grain yield (kg/ha) for different nitrogen strategies across all canola varieties.

Summary

As a result of a sowing error the design of the trial became unbalanced, and the conclusions that we can draw from this trial are limited. In saying that, there are some trends that can be noted.

This trial showed that variety choice is one of the key factors in producing high yielding irrigated canola crops. Hyola 50 demonstrated that it is still one of the best varieties for irrigation, out yielding all other varieties in this trial. The variety Garnet also performed well across the board, as did Pioneer 44Y87CL.

Another important factor in this trial was nitrogen application. Applying either 50 kg N/ha or 100 kg N/ha (either all at sowing or split) gave the highest yields. Although having no nitrogen applied at sowing looked as good as the other nitrogen treatments early in the season, it did not yield as well. The effect of nitrogen may have been masked by the high residual nitrogen in this trial paddock.

Acknowledgements

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