

## Trial 2. Canola YieldMax trial (FAR NSW C23-02)

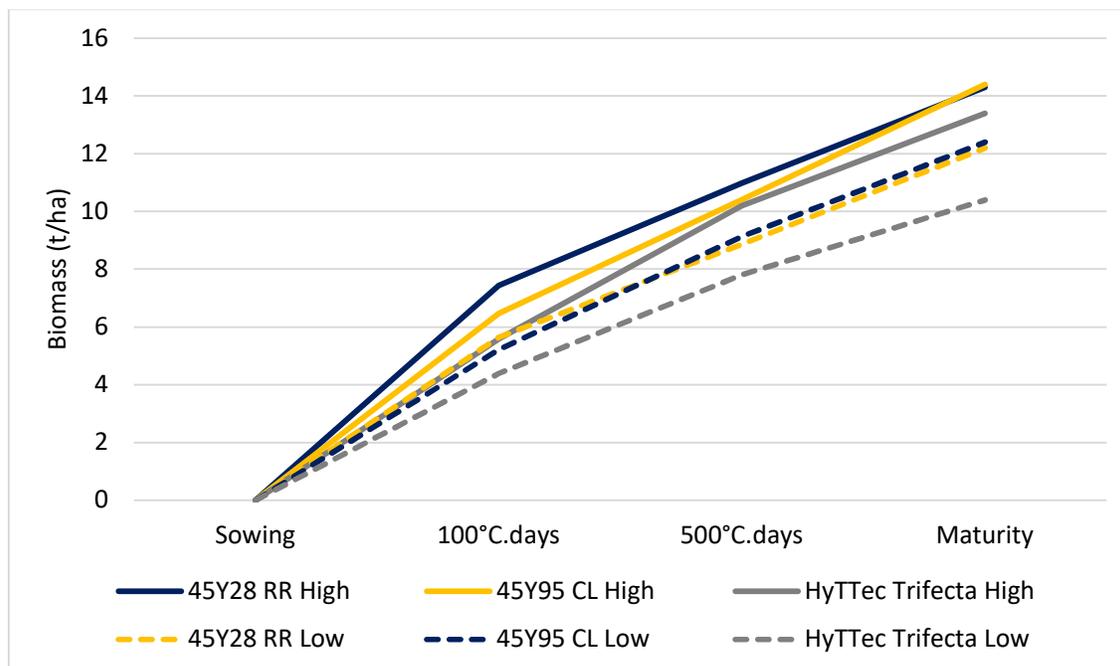
**Objectives:** To determine the response to nutrient input across nine hybrid canola varieties.

### Key points:

- *Crop biomass of three hybrids was measured at early flowering (100°C.days after the start of flowering), late flowering (500°C.days after the start of flowering) and again at maturity.*
- *Differences between varieties and nutrition were observed at the early flowering assessment, with 6.5 t/ha of biomass for the high input nutrition treatment and 5.1 t/ha for the low input treatment. 45Y28 RR and 45Y95 CL both had higher biomass than the TT variety HyTTec Trifecta.*
- *Growth of these treatments remained consistent across the treatments for the two subsequent assessments, with final biomass rankings similar at crop maturity to the rankings observed at early flowering.*
- *A 0-10 cm soil test was completed on the high and low input treatments at the early flowering biomass assessment. Despite the large differences in N rate applied, mineral N was the same across the two treatments (~63 kg N/ha in 0-10 cm), but there were large differences in Colwell P between treatments, with high input at 58 mg/kg and low input at 31 mg/kg.*
- *Grain yield was measured on these three hybrids plus a further six hybrids that did not have biomass assessments. InVigor R4520P was the fastest variety in the trial and had the highest grain yield in a warm and relatively dry spring. Other varieties with relatively high yield included 45Y28 RR, 45Y95 CL and Nuseed Eagle TF.*
- *The High Input treatment (45 kg P/ha, 225 kg N/ha + 3 t/ha chicken manure) yielded 0.76 t/ha more than the Low Input treatment (15 kg P/ha, 75 kg N/ha).*
- *Oil concentration was highest in NCH22K902 and 45Y28 RR. The high input treatment reduced oil (down 1.7%) and increased protein (up 2%) across all varieties.*
- *Detailed yield component assessment including harvest index, seeds/pod and pods/m<sup>2</sup> was completed on two input levels of 45Y28 RR, 45Y95 CL and HyTTec Trifecta. The High Input treatment increased final biomass of all varieties, but also increased harvest index i.e. more biomass was converted to grain, even at higher biomass levels. The High Input treatment increased seeds/pod, pods/m<sup>2</sup> and seed size.*
- *The warm and dry finish to the season combined with good early growth was the conditions where it could be expected to see a crop 'hay-off', but these trials show that the opposite, where higher nutrition gave higher biomass, better conversion of biomass to grain and higher yield.*

### Treatments

Eight canola varieties were subjected to two levels of management described as high and low input. The details of these two management approaches are described in Table 5.



**Figure 1.** Biomass of three canola varieties with two nutrient input treatments, measured at 100°C.days (11 days) and 500°C.days (46 days) after the start of flowering, and again at crop maturity.

**Table 1.** Grain yield of nine canola hybrids sown with two levels of nutrient input at Wallendbeen 2023.

| Cultivar                          | Grain Yield (t/ha) |                |             | Flowering*<br>Date |
|-----------------------------------|--------------------|----------------|-------------|--------------------|
|                                   | Low Input          | High Input     | Mean        |                    |
| 1 45Y28 RR                        | 3.24               | 3.97           | <b>3.60</b> | 27 August          |
| 2 Eagle TF                        | 3.33               | 4.01           | <b>3.67</b> | 23 August          |
| 3 InVigor R4520P                  | 3.33               | 4.18           | <b>3.76</b> | 12 August          |
| 4 HyTTec Trifecta                 | 2.87               | 3.93           | <b>3.40</b> | 24 August          |
| 5 Hyola Blazer TT                 | 2.71               | 3.68           | <b>3.20</b> | 20 August          |
| 6 RGT Baseline                    | 2.88               | 3.58           | <b>3.23</b> | 27 August          |
| 7 45Y95 CL                        | 3.22               | 4.02           | <b>3.62</b> | 25 August          |
| 8 Hyola Solstice CL               | 3.10               | 3.71           | <b>3.41</b> | 20 August          |
| 9 NCH22K902                       | 3.11               | 3.60           | <b>3.35</b> | 25 August          |
| <b>Mean</b>                       | <b>3.09</b>        | <b>3.85</b>    | <b>3.47</b> |                    |
| <b>LSD Cultivar p = 0.05</b>      | 0.20               | <b>P value</b> | <0.001      |                    |
| <b>LSD Management p=0.05</b>      | 0.18               | <b>P value</b> | <0.001      |                    |
| <b>LSD Cultivar x Man. P=0.05</b> | ns                 | <b>P value</b> | 0.219       |                    |

\* 50% of plants with one open flower

**Table 2.** Grain oil and protein concentrations of nine canola varieties with two levels of nutrient input at Wallendbeen, 2023.

| Cultivar                          | Oil concentration (%) |                |             | Protein concentration (%) |                |             |
|-----------------------------------|-----------------------|----------------|-------------|---------------------------|----------------|-------------|
|                                   | Low Input             | High Input     | Mean        | Low Input                 | High Input     | Mean        |
| 1 45Y28 RR                        | 51.5                  | 49.6           | <b>50.5</b> | 15.2                      | 17.2           | <b>16.2</b> |
| 2 Eagle TF                        | 49.5                  | 47.8           | <b>48.7</b> | 17.0                      | 19.3           | <b>18.2</b> |
| 3 InVigor R4520P                  | 46.9                  | 45.5           | <b>46.2</b> | 17.7                      | 19.4           | <b>18.6</b> |
| 4 HyTTec Trifecta                 | 49.4                  | 47.9           | <b>48.6</b> | 18.3                      | 19.9           | <b>19.1</b> |
| 5 Hyola Blazer TT                 | 47.7                  | 46.1           | <b>46.9</b> | 18.8                      | 20.9           | <b>19.9</b> |
| 6 RGT Baseline                    | 49.9                  | 48.8           | <b>49.3</b> | 17.7                      | 19.0           | <b>18.4</b> |
| 7 45Y95 CL                        | 46.9                  | 45.4           | <b>46.1</b> | 17.5                      | 19.4           | <b>18.4</b> |
| 8 Hyola Solstice CL               | 49.3                  | 47.1           | <b>48.2</b> | 15.9                      | 18.8           | <b>17.3</b> |
| 9 NCH22K902                       | 52.6                  | 50.2           | <b>51.4</b> | 15.7                      | 18.0           | <b>16.9</b> |
| <b>Mean</b>                       | <b>49.3</b>           | <b>47.6</b>    | <b>48.4</b> | <b>17.1</b>               | <b>19.1</b>    | <b>18.1</b> |
| <b>LSD Cultivar p = 0.05</b>      | 0.45                  | <b>P value</b> | <0.001      | 0.49                      | <b>P value</b> | <0.001      |
| <b>LSD Management p=0.05</b>      | 0.25                  | <b>P value</b> | <0.001      | 0.26                      | <b>P value</b> | <0.001      |
| <b>LSD Cultivar x Man. P=0.05</b> | ns                    | <b>P value</b> | 0.166       | 0.72                      | <b>P value</b> | 0.014       |

**Table 3.** Harvest Index and yield components of three canola varieties and two Input levels at Wallendbeen in 2023.

| Variety           | Harvest Index | Seeds/m <sup>2</sup> | Pods/m <sup>2</sup> | Seeds/pod | TGW Seed |
|-------------------|---------------|----------------------|---------------------|-----------|----------|
| 1 45Y28 RR        | 0.34          | 105329               | 5024                | 21.3      | 3.42     |
| 2 45Y95 CL        | 0.31          | 108248               | 5204                | 20.5      | 3.38     |
| 3 HyTTec Trifecta | 0.32          | 93104                | 4807                | 19.3      | 3.63     |
| <b>LSD P=0.05</b> | 0.08          | 8546                 | ns                  | 0.9       | ns       |
| <b>Input</b>      |               |                      |                     |           |          |
| 1 High            | 0.33          | 111919               | 5335                | 20.9      | 3.57     |
| 2 Low             | 0.31          | 92534                | 4680                | 19.7      | 3.38     |
| <b>LSD P=0.05</b> | 0.05          | 5136                 | 246                 | 0.6       | 0.15     |

**Table 4:** Soil characteristics across two nutrient input treatments, measured 100°C.days after the start of flowering.

|                              | Low Input (0-10 cm) | High Input (0-10 cm) |
|------------------------------|---------------------|----------------------|
| <b>Total Mineral N</b>       | 60.8 kg/ha          | 66.8 kg/ha           |
| <b>Phosphorus (Colwell)</b>  | 31.2 mg/kg          | 58.0 mg/kg           |
| <b>Potassium (Colwell)</b>   | 118 mg/kg           | 224 mg/kg            |
| <b>KCl Sulfur</b>            | 15.5 mg/kg          | 11.8 mg/kg           |
| <b>Organic Carbon</b>        | 1.75 %              | 1.65 %               |
| <b>pH (CaCl<sub>2</sub>)</b> | 5.0 pH              | 5.1 pH               |

**Table 5.** Trial management details for Canola YieldMax trial at Wallendbeen 2023

|                          |                                 |   |
|--------------------------|---------------------------------|---|
| <b>Sowing Date</b>       | <b>27 April 2023</b>            |   |
| <b>Sowing Rate:</b>      | Target 40 plants/m <sup>2</sup> |   |
| <b>Seed Treatment:</b>   | Saltro Duo                      |   |
| <b>Basal Fertiliser:</b> |                                 |   |
| <b>Low input</b>         | 27 April                        | 170 kg/ha Single Super (Broadcast pre-sow)<br>15 kg/ha P + 20 kg/ha S   |
| <b>High input</b>        | 27 April                        | 170 kg/ha Single Super (Broadcast pre-sow)<br>130 kg/ha MAP<br>43 kg/ha P + 20 kg/ha S<br>3 t/ha chicken manure |
| <b>Nitrogen:</b>         |                                 |   |
| <b>Low input</b>         | 3 June                          | 37.5 kg N/ha (82 kg/ha urea)<br>37.5 kg N/ha (82 kg/ha urea)  |
| <b>High input</b>        | 18 August                       | 112.5 kg N/ha (245 kg/ha urea)<br>112.5 kg N/ha (245 kg/ha urea)  |
| <b>Fungicide:</b>        |                                 |   |
|                          | 1 June                          | Prosaro 0.45 L/ha   |
|                          | 4 September                     | Aviator Xpro 0.8 L/ha   |

\*Refer to '[Appendix. HYC Canola NSW Crop Technology Centre](#)' for manure analysis.

**Table 6.** Active ingredients and chemical loading (g/L) for products used.

| <b>Name</b>      | <b>Active 1</b> |         | <b>Active 2</b> |         | <b>Type</b> |
|------------------|-----------------|---------|-----------------|---------|-------------|
| <b>Fungicide</b> |                 |         |                 |         |             |
| Aviator Xpro     | Prothioconazole | 150 g/L | Bixafen         | 75 g/L  | EC          |
| Prosaro          | Prothioconazole | 210 g/L | Tebuconazole    | 210 g/L | SC          |
| Saltro Duo       | Pydiflumetofen  | 200 g/L | ---             | ---     | FS          |