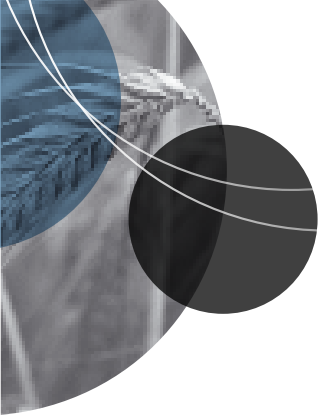

Agronomy – canola

Effect of sowing date on phenology and grain yield of twelve canola varieties – Wagga Wagga 2016

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Key findings

- Sowing canola early highlights the inherent differences in phenology.
- Slow-developing varieties maintained consistent yield across all sowing dates (late March to late April), whereas fast-developing varieties achieved their highest yield from late April sowing.
- Early flowering (from sowing fast-developing varieties early) reduced yield potential and exposed those treatments to greater disease pressure.

Introduction

Traditionally, canola sowing started around 25 April (Anzac Day) and finished in May. Recently there has been an increased interest in sowing canola early (late March to mid April). This experiment was designed to test the response of 12 canola varieties with varying phenologies and plant type to early sowing, compared with the more traditional sowing date in late April.

Site details

Location	Downside, approximately 25 km north-west of Wagga Wagga
Soil type	Gravelly red–brown chromosol
Previous crop	Faba beans
Fallow rainfall	243 mm (November 2015–March 2016)
In-crop rainfall	625 mm (April 2016–October 2016)
Soil pH_{Ca}	5.3 (0–10 cm, 29 April)
Soil nitrogen	133 kg/ha (0–120 cm, 29 April)
Nitrogen applied	Urea (46% nitrogen) 217 kg/ha, 28 March (broadcast and incorporated by plot seeder) Urea 217 kg/ha, 8 June (broadcast)
Soil phosphorus	31 mg/kg (Colwell)
Starter fertiliser	100 kg/ha mono-ammonium phosphate (11% nitrogen, 22.7% phosphorus, 2% sulfur), treated with 2.8 L/t flutriafol (500 g/L)

Treatments

Varieties

Archer, ATR Gem(ϕ), ATR Stingray(ϕ), Hyola® 559TT, Hyola® 575CL, Hyola® 725RT, Hyola® 600RR, IH30 RR, Nuseed Diamond, Nuseed GT-50, Pioneer® 44Y89 (CL), Pioneer® 45Y88 (CL)

Sowing date (SD)

SD1: 31 March
SD2: 13 April
SD3: 29 April

Results

Phenology

Archer was the slowest variety to start flowering from each sowing date (Figure 1). Nuseed Diamond was the fastest variety to start flowering from SD1 but ATR Stingray(ϕ) was the fastest variety to start flowering from SD3. There was 19 days between the start of flowering for SD1 and SD3 for Archer, compared with 59 days for Nuseed Diamond. The ability of Archer to flower in a relatively tight flowering window, regardless of sowing date, means that it has a wide and flexible sowing window.

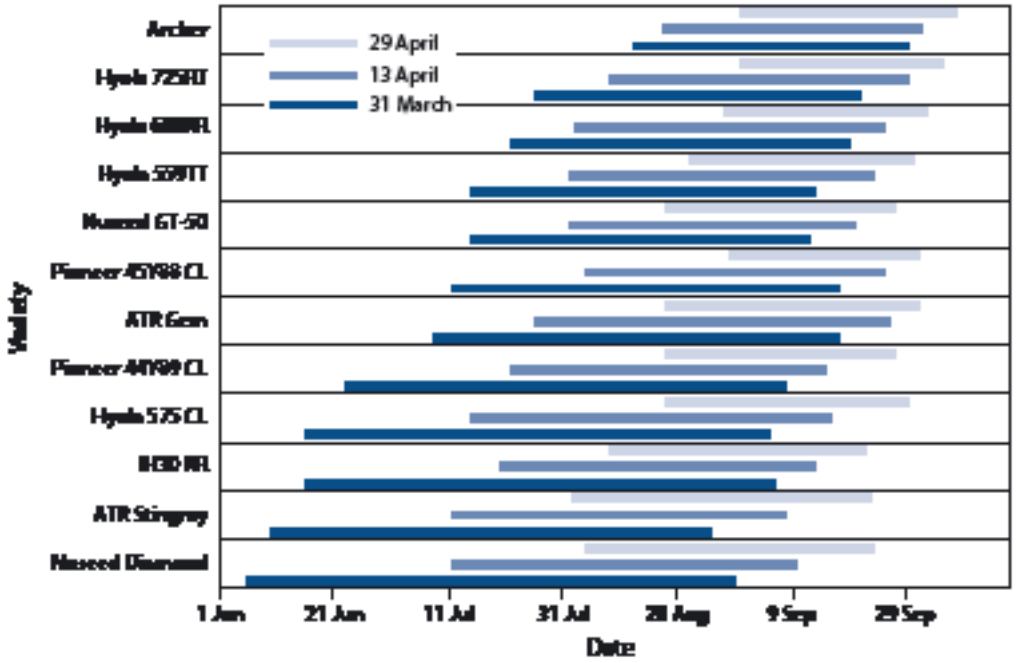

Figure 1. Flowering window of 12 canola varieties sown on three sowing dates at Wagga Wagga, 2016. The date at the left hand end of each line is the start of flowering (50% of plants with one open flower). The date at the right hand end of each line is the end of flowering (95% of plants with no flowers).

Grain yield

Slower developing varieties such as Archer, Nuseed GT-50 and Hyola® 600RR maintained consistent grain yield across sowing dates (Table 1). Nuseed GT-50 was the only variety to yield above 4 t/ha from each sowing date. The highest individual yield was Nuseed Diamond sown on 29 April at 4.8 t/ha.

Fast-developing varieties such as Nuseed Diamond, ATR Stingray(ϕ), Pioneer® 44Y89 (CL) and Hyola® 575CL yielded less from early sowing. These varieties flowered too early to maximise biomass and seed number, and were exposed to more disease pressure (upper canopy blackleg and sclerotinia stem rot) from the early flowering.

Oil concentration

Oil concentration increased for all varieties as sowing was delayed from 31 March to 29 April. This result was not expected, as many experiments over a number of years have shown a decline in oil concentration with later sowing. The variety with the highest oil concentration,

averaged across sowing dates, was Hyola® 600RR. The variety with the lowest average oil concentration was IH30 RR.

This experiment showed a strong interaction between variety and planting date. Fast-developing varieties flowered too early, which limited grain yield potential and exposed them to increased disease pressure. Slower-developing varieties flowered in a tighter window (across sowing dates) and maintained relatively consistent yield.

Table 1. Grain yield (t/ha) and oil concentration (at 6% moisture) of 12 canola varieties sown on three sowing dates at Wagga Wagga, 2016.

Variety	Grain yield (t/ha)			Oil concentration (%)		
	Sowing date			Sowing date		
	31 March	13 April	29 April	31 March	13 April	29 April
Nuseed Diamond	3.1	4.4	4.8	42.1	44.7	44.6
ATR Stingray	2.6	3.4	3.9	42.5	44.8	45.9
IH30 RR	3.4	3.1	3.9	41.4	42.9	44.4
Hyola 575CL	3.5	3.8	3.3	41.7	43.1	45.2
Pioneer 44Y89 CL	3.4	4.2	4.3	42.0	42.9	45.4
ATR Gem	3.5	3.8	3.3	44.1	45.3	47.0
Pioneer 45Y88 CL	3.7	3.8	4.1	41.8	43.4	44.8
Hyola 559TT	3.4	3.8	3.8	44.0	46.7	45.9
Nuseed GT-50	4.1	4.1	4.2	43.8	44.9	45.2
Hyola 600RR	3.9	4.1	4.4	43.8	46.0	47.1
Hyola 725RT	3.0	4.0	3.5	43.3	46.3	47.1
Archer	4.0	3.6	4.1	44.9	44.8	45.7
l.s.d. ($P<0.05$)	0.46			1.2		

Conclusion

Selecting a canola variety is difficult as the decision is often made long before a grower knows the likely planting date. This research shows that there are varieties, such as Archer, Hyola® 600RR and Nuseed GT-50, that are more flexible in their planting window. These varieties are able to regulate their development from early sowing so that they do not flower in early winter. Faster developing varieties such as Nuseed Diamond and ATR Stingray(b) are inflexible in their planting window, therefore best suited to a later sowing time.

Acknowledgements

This experiment was part of the project 'Optimised Canola Profitability', CSP00187, 2014–19, with joint investment by NSW DPI, CSIRO and GRDC.

Thank you to the site cooperator Ben Beck and to technical support from Jess Simpson and Hayden Petty.