DAW00227
Tactical Break Crop Agronomy in Western Australia

14WH10- Timing of nitrogen in low rainfall canola

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Location of trial	Buntine

Summary (Key messages)

- In a dry year, there was no economic response to applied N.

Background

In general, as long as nitrogen is applied within 8 weeks of sowing, there is no yield penalty.

How canola responds to nitrogen applied later than 8 weeks has not been widely researched. Similarly how new generation canola such as RoundupReady (RR) hybrids respond to nitrogen has not been widely tested, particularly in low and medium rainfall areas.

Aim

To investigate the response to changing the nitrogen rate and changing the time of application. Canola yield and oil will be measured and RR hybrids will be compared with open-pollinated TT types (OP TT).

Trial Details

- Property: Liebe Group Main Trial Site: Fitzsimons Farm – 17km East of Buntine along Dinnie Rd, East Buntine
- Growing Season rainfall (GSR, April to Oct) = 136 mm, GSR + stored water (estimate) = 186 mm. Long term average (LTA, 1974on) 242 and 283 mm.
- Soil type: Sand over gravel (0.88% organic carbon), estimated to be 54 kg N/ha available in paddock from soil and plant residues
- Paddock rotation: Wheat 2013, Canola 2012, Wheat 2011, Lupin 2010
- 22 treatments: 2 Cultivars (Sturt TT [TT open-pollinated variety] and Pioneer 43Y23 RR [RR hybrid variety]) x 11 N treatments (kg N/ha) with timing spread between seeding, and up to 12 weeks after sowing –see Table 1;
- 3 replicates
- Sowing date May 1
- Seeding rate – Target density 30 plants/m^2 - Sturt TT 2.4 kg/ha, Pioneer 43Y23 RR 1.5 kg/ha
- Basal Fertiliser: 80 kg/ha of MacroPro Plus (10%N, 14%P, 8.4%K, 8%S, Cu 0.1, Zn 0.2, Mn 0.01) at seeding – error resulting in all plots receiving 8 kg N/ha.

Treatment detail

		kg N/ha at:			
Treatment ment	Name	Seeding	8WAS	12WAS	Total N
1	8N Seeding	8*	0	0	0
2	18N Seeding	18	0	0	10
3	30N in 8weeks	18	12	0	30
4	50N in 8weeks	18	32	0	50
5	70N in 8weeks	18	52	0	70
6	18N seeding and 12N 12WAS	18	0	12	30
7	18N seeding and 32N 12WAS	18	0	32	50
8	18N seeding and 52N 12WAS	18	0	52	70
9	30N in 8weeks and 10N 12WAS	18	12	10	40
10	30N in 8weeks and 20N 12WAS	18	12	20	50
11	30N in 8weeks and 40N 12WAS	18	12	40	70

*Due to MacroPro Plus being used at sowing instead of SuperPhos

Assumptions used in Gross Margins

Oil bonus +/- 1.5% per unit of oil (%) either side of 42%, with no oil ceiling.

Additional costs such as seeding, harvest, insecticides assumed to be $113/ha.

Nitrogen costs $1.33/kg or $1.5/L, application costs $8/ha

RR costs – seed $76/ha, Herbicides $47/ha, Grain worth $513t (5 Year decile price)

TT costs – seed $5/ha, Herbicides $56/ha, Grain worth $535/t

Results

Below average rainfall in June, July and August resulted in low grain yields of around 0.5 t/ha. Consequently the response to N was limited and gross margins were maximised at the lowest rate of applied N of 8 kg N/ha.

Pioneer 43Y23 (RR) and Sturt (TT) performed similarly in terms of grain yield, oil %, oil yield and gross margins.

Grain yield (P = 0.88) and oil yield (P = 0.72) did not respond to applied nitrogen. The highest rates of N of 50 and 70 reduced oil %. Both varieties responded similarly to applied nitrogen with no variety x N rate interaction for grain yield, oil %, oil yield and gross margin. When nitrogen was applied did not alter the response to nitrogen of both varieties for GY (P = 0.42), oil % (P = 0.16), oil yield (P = 0.364) and gross margin (P= 0.38).

Conclusion

In a dry year, there was no economic response to applied N.

Acknowledgements

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Links

For other reports related to this trial see https://www.agric.wa.gov.au/canola/canola-nitrogen-trials

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