

DAW00227

Tactical Break Crop Agronomy in Western Australia

13ED12 - Timing of nitrogen in low rainfall canola

Authors

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Location of trial

Tim Osborne's Salmon Gums

Summary (Key messages)

In this 2013 trial

- Time of nitrogen application had a minor effect on grain yield, oil and gross margins
 - applying 50 kg N/ha in a split application with 25 kg N/ha applied at seeding and 25 kg N/ha applied 12WAS was the equal of any other treatment
- Both CB Telfer and Hyola 404RR responded similarly to nitrogen rate and timing of application.
 - Consequently due to lower seed costs, CB Telfer produced on average higher gross margins of \$415/ha compared to \$307/ha for Hyola 404RR.

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. This trial is one of a series of 13 timing of nitrogen experiments DAFWA conducted in 2013.

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: Tim, Dave and Fiona Osborne's, Eldred Road Salmon Gums
- Agzone 5, Growing Season rainfall (GSR) = 206 mm, GSR + stored water (estimate) = 277 mm
- Soil type: sandy loam (0.8% organic carbon)
- Paddock rotation Wheat 2012, Barley 2011, Canola t/ha 2010
- 34 treatments: 2 Cultivars (CB Telfer [TT open-pollinated variety] and Hyola 404 RR [RR hybrid variety]) x 14 N treatments (kg N/ha) with timing spread between seeding, and up to 12 weeks after sowing –see Table 1;
- 3 replicates
- Sowing date April 17

Trial Details

- Seeding rate – Target density 30 plants/m² - CB Telfer 2.7 kg/ha, Hyola 404RR 3.4 kg/ha
- Fertiliser (kg/ha) 100 kg/ha of Superphos at seeding, 120 kg/ha of Muriate of Potash and 400 kg/ha of gypsum (17% Ca, 14% S) topdressed over whole site 4 weeks after seeding

Treatment detail

Table 1 Treatment details for 13ED12 at Salmon Gums in 2013 (WAS = Weeks after seeding)

No.	Total N	Treatname	N kg/ha			
			Seeding	4WAS	8WAS	12WAS
1	0	0N	0	0	0	0
2	25	0N 25N	0	25	0	0
3	25	0N 0N 25N	0	0	25	0
4	25	0N 0N 0N 25N	0	0	0	25
5	25	25N	25	0	0	0
6	50	50N	50	0	0	0
7	50	0N 50N	0	50	0	0
8	50	0N 0N 50N	0	0	50	0
9	50	0N 0N 0N 50N	0	0	0	50
10	50	25N 25N	25	25	0	0
11	50	25N 0N 25N	25	0	25	0
12	50	25N 0N 0N 25N	25	0	0	25
13	75	25N 25N 25N	25	25	25	0
14	100	25N 50N 25N	25	50	25	0

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 \$100/ha.

Nitrogen costs \$1/kg, application costs \$8/ha

RR costs – seed \$31/kg, Herbicides \$28/ha, Grain worth \$482/t (CBH Pool Esperance 5/11/13).

TT costs – seed \$2/kg, Herbicides \$47/ha, Grain worth \$502/t (CBH Pool Esperance 5/11/13).

Results

1. *Splitting nitrogen applications produced similar or higher canola yield and returns.*

Time of nitrogen application had a minor effect on grain yield, oil and gross margins

2. *Both CB Telfer and Hyola 404RR responded similarly to nitrogen rate and timing of application.*

Consequently due to lower seed costs, CB Telfer produced on average higher gross margins of \$415/ha compared to \$307/ha for Hyola 404RR

3. *Increasing nitrogen fertiliser increased canola yields*

Highest grain yield was produced at the two highest nitrogen rates of 75 and 100 kg N/ha

4. *Gross margins and rates of return were maximised at medium rates of nitrogen – 50 kg N/ha*

Applying 50 kg N/ha in a split application with 25 kg N/ha applied at seeding and 25 kg N/ha applied 12WAS was the equal of any other treatment

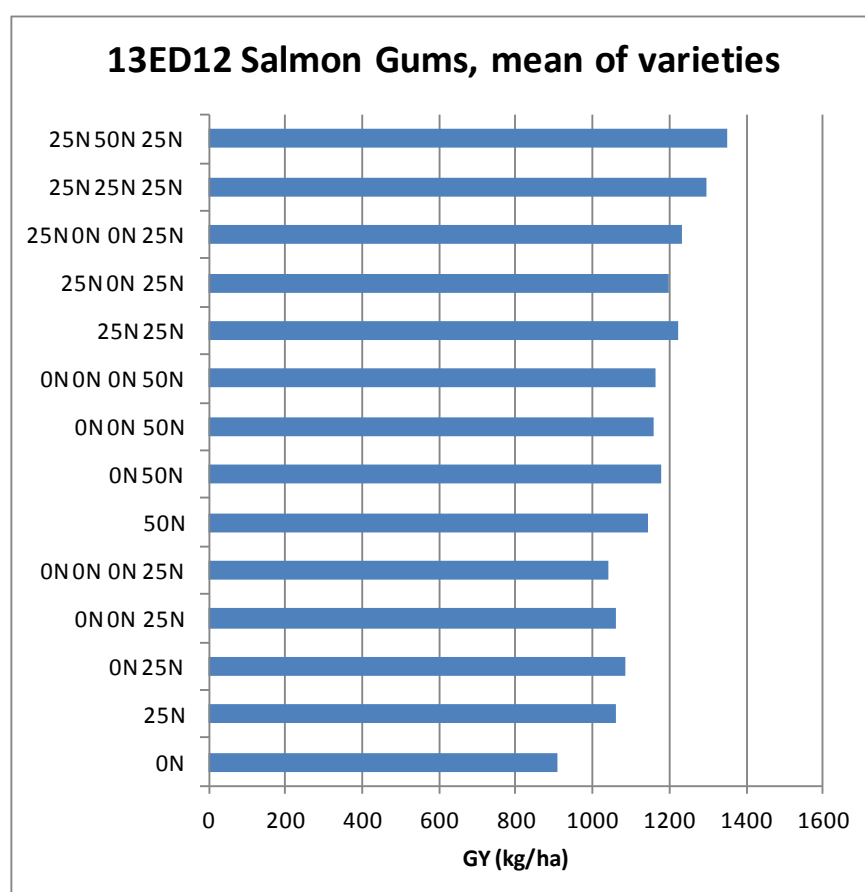


Figure 1 Effect of nitrogen fertiliser and split applications on the grain yield (kg/ha) of canola at Salmon Gums in 2013 (13ED12), LSD = 82 kg/ha.

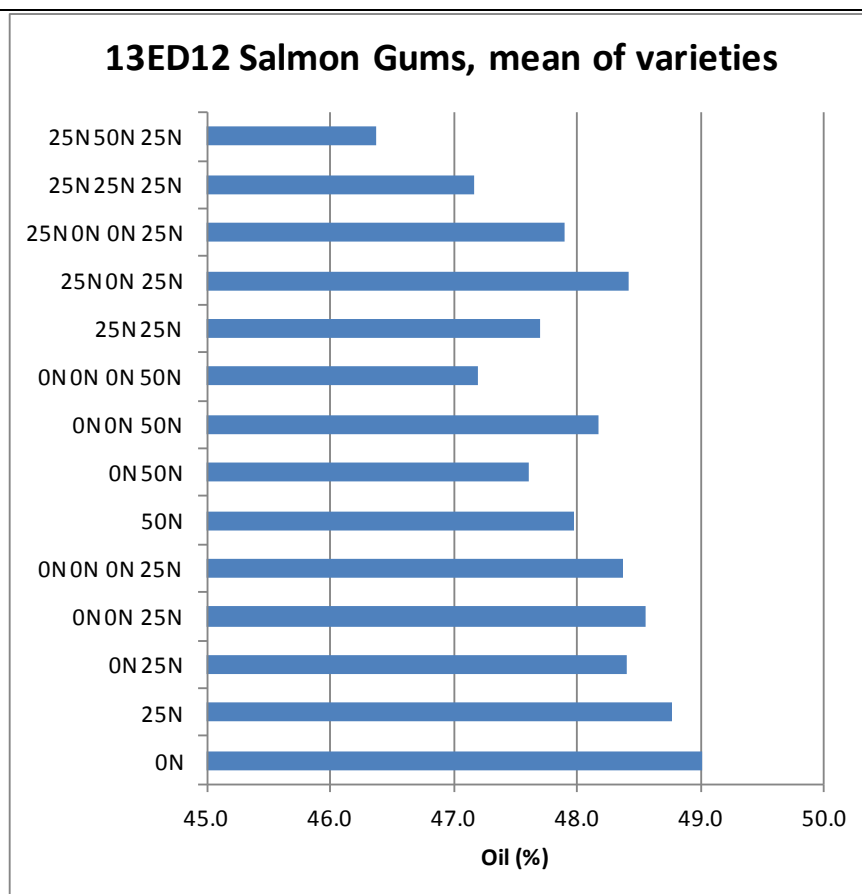


Figure 2 Effect of nitrogen fertiliser and split applications on the oil content (%) of canola at Salmon Gums in 2013 (13ED12), LSD = 0.5%

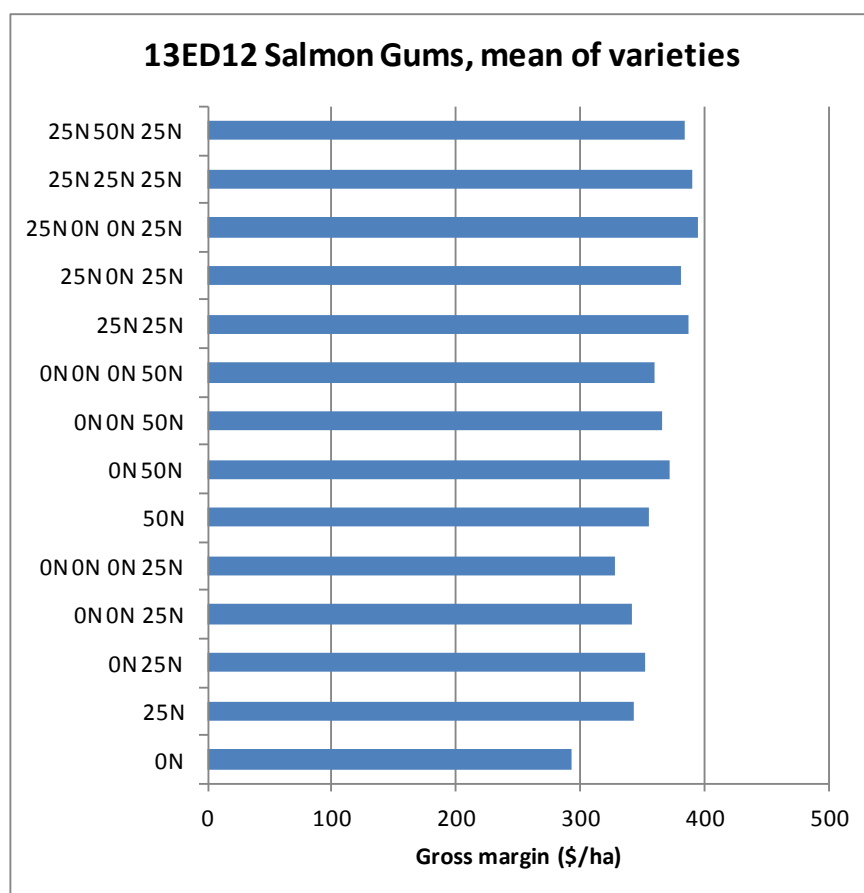


Figure 3 Effect of nitrogen fertiliser and split applications on the gross margin (\$/ha) of canola at Salmon Gums in 2013 (13ED12), LSD = \$42/ha

Conclusion

Surveys conducted at spring field days throughout WA in 2013 indicated that the majority of farmers apply nitrogen at both seeding and 8 weeks after sowing. Very few farmers apply nitrogen later than 8 weeks after sowing. In this experiment we showed that canola continued to respond to nitrogen applied at 12 weeks after sowing. This indicates that farmers may be able to hedge their bets earlier in the season and reduce nitrogen inputs until they have a better idea of their canola crops yield potential and if they believe the crop will respond to further nitrogen inputs they can continue to apply nitrogen to flowering canola.

Acknowledgements

This trial is one of a series conducted throughout WA as part of the GRDC/DAFWA co-funded project "Tactical Break Crop Agronomy in Western Australia". Thanks to the Osborne family for hosting the trial and to the Esperance RSU for trial management. Pam Burgess (DAFWA, Esperance) provided technical assistance to ensure all treatments and measurements occurred in a timely and accurate fashion.

Links

For other reports related to this trial see NVTplus

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