TOPCROP State Focus 2001 - "Putting the *N* in ca*N*ola"

The aim of these nearest neighbour demonstration sites was to investigate the most profitable nitrogen application rates for different regions of the state.

Summary
Large plot sites run by TOPCROP groups across the state generated many opportunities for discussing and fine tuning nitrogen management in canola. The season was the main factor influencing yields and gross margins. Nitrogen application of about 10-20 kg/ha for the Mallee and 10-50 kg/ha for the Wimmera gave best yields and gross margins at most sites in a difficult season.

Background

TOPCROP is about informed decision making based on crop monitoring. Participants address industry issues while accessing local, farm-based plots for evaluating technology and sharing knowledge and experience. Groups choose to be involved in the State Focus if it addresses the needs of the group.

The TOPCROP State Focus in 2001 was "Putting the *N* into Ca*N*ola". Canola is a big user of nitrogen and to get the best return on every dollar invested it is important to balance the cost of nitrogen application with potential yield and commodity price risk. TOPCROP groups across the investigated how much nitrogen to apply to maximise profit in their situation.

Methods

There were 19 sites across the state - 5 Mallee, 6 Wimmera, 4 North Central/North East, 2 irrigated and 2 South West sites. Groups sowed and managed the sites using farm equipment, so plots were 5 m or wider by 100 m or longer. Crop monitoring results were used to discuss management implications and options, often with visiting experts providing the latest information.

About hosting a State Focus site: "We were running out of time, so I just rang up one day and said 'I'm putting those plots in today you'd better come and do a soil test', it was as easy as that" Max Golder, Brim group

Large plots improved on-farm relevance, but meant replication wasn't possible. To improve the reliability of conclusions, every third plot at each site was the same treatment – a "control". This meant the replicated "control" results could be used with analysis of variance techniques to estimate residual errors, least significant differences and probability values for comparing the treatments. Results are not as rigorous as for replicated trials and are for one season only.

Basic treatments were base nitrogen, farmer/district practice, point of no return on dollar invested in nitrogen and potential yield. Potential yield was based on average growing season rainfall. The canola calculator developed by Dr Rob Norton (University of Melbourne) was used to assist in calculating the point of no return treatment. Groups modified and added treatments to address local issues.

"It's been interesting to be involved in the State Focus. People have been trampling in and out all year to see what was happening" Colin Freemantle, Laanecoorie group.

Results

Full details of the State Focus results will be available in the final report (contact Marg Evans on 5430 4414 for a copy) and on the TOPCROP website (**http://topcrop.grdc.com.au**) in early March.

Interpretation

Findings from the State Focus included:

- Increasing nitrogen application did not usually result in increased yields. This meant gross margins decreased at higher nitrogen rates at most sites. Nitrogen applications of 10-20 kg/ha for the Mallee and 10-50 kg/ha for the Wimmera usually gave best yields and gross margins in a difficult season.

"This trial has shown that you have wasted your nitrogen if you applied any, given what the soil contains and the season this year" Fyfe Grieves and Denis Demeo, Raywood group.

- Crops at most Wimmera and high rainfall sites had used most or all available 0-60 cm soil nitrate nitrogen (not including mineralisation) by the 4-6 leaf stage. Without applied nitrogen, these sites would have been at risk of nitrogen deficiency early in the season.
- The Kaniva site had low plant numbers (33-58 per m^2) but still achieved great yields (over 3.5 t/ha). High plant densities were not critical for achieving a good yield in 2001.
- Nitrogen uptake by the crop (as measured by combining NIR and dry matter results) at the 4-6 leaf stage was a good predictor of final yield. Further field validation may prove NIR to be a useful nitrogen management tool for canola.

Commercial Practice

- In 2001, nitrogen application rates at the lower end of the normal district/farmer practice range gave the best economic result.
- Where little nitrogen is being applied at or pre-sowing, then it is probably best to broadcast nitrogen at the 4-6 leaf stage at the latest. Results from 2001 State Focus sites suggest that leaving application until later risks subjecting the crop to early nitrogen stress. This is not so important for lower rainfall districts or paddocks with very high soil nitrogen.
- Consider carefully before resowing canola crops that have low plant densities. The 2001 crops had good capacity to yield even with plant densities below recommended.

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