

8.1.2 EVALUATION OF PLANT GROWTH REGULATORS IN CANOLA (CRESSY, TAS)

Abstract:

Three plant growth regulators: metconazole, tebuconazole and uniconazole were applied to canola to reduce plant height and determine yield effects. There was a reduction in plant height with all three treatments and this was generally rate responsive. As in a previous trial conducted in 2003-04 there was little effect on grain yield.

Researcher:

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Acknowledgments:

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Funding Organization:

GRDC

Location:

Cressy Research Station, Cressy, Tasmania

Growing season rainfall (April-Nov): 436 mm

Background/Objectives:

Excess vegetative growth can result in decreased crop yields through lodging and difficulties in harvesting. In addition yield may be reduced through less plant assimilates and nutrients being available for grain fill. Plant growth regulators (PGR's) have been used for a number of years on cereals in Europe to reduce plant height and strengthen the stem.

To date PGR trials on canola in Australia have focussed on using cereal growth regulators. It appears that two PGR's registered for use on canola in the UK have not been evaluated in Australia. The aim of this trial was to evaluate plant growth regulators currently used on canola in the UK.

Methodology:

Three chemicals (tebuconazole, metconazole and uniconazole) were applied at 3 rates at the yellow bud stage (27th Sept 2004). Tebuconazole (better known as Folicur) and metconazole were applied at the range of recommended rates used in the UK ie tebuconazole: 125 g/ha and 250g/ha ai and metconazole: 35g/ha and 70g/ha ai. In addition a rate equal to 3X the lower rate of each chemical was applied.

There were 3 replicates in a randomised block design.

In addition uniconazole, a PGR recently registered for commercial use in poppy crops, was also trialled. A similar range of rates was used ie (37.5, 75.0, 112.5g/ha ai) but as this was an initial evaluation treatments were not replicated. Treatments were applied through a knapsac sprayer with a 1.2m boom.

To analyse the performance of uniconazole, results from the 3 rates were pooled. Prior to grain harvest the height of each plot was measured (mean of 3 values).

Variety: ATR Grace
Sowing date: 7th June 2004
Sowing rate: 5 kg/ha

Harvest date: 22nd Dec 2004

Fertiliser: basal - 9:14:17 + B at 300kg/ha,
topdressing – urea at 93 kg/ha x 2

Pest Control:

Lemat, Atrazine @ 2l/ha (17th Aug)



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Results and Discussion:

The 2004-05 season can be summarised as initially very wet (June and early July) then relatively dry for the rest of winter/early spring with reasonably good finishing rains.

Final crop height was short due to relatively low temperatures in winter and spring. Within two weeks of treatment, height differences were visually apparent, particularly with the higher rates of uniconazole and metconazole. There was no apparent bounce-back effect and these height differences carried through to harvest. There was no lodging in any treatments.

Application of all PGR's resulted in a height reduction compared with untreated plots and this effect increased with rate. The height reduction was greatest with application of uniconazole (not replicated). In the replicated treatments, all three rates of metconazole resulted in a reduction in plant height but there was no significant difference between the two higher rates.

With tebuconazole the effect was less and only the higher rate produced a significant decrease in height.

The individual rates of PGR's had no significant effect on grain yield ($P=0.17$). However when data for each active ingredient was pooled, the tebuconazole treated plot yields were significantly higher than for the metconazole plots. Metconazole appears to be more active than tebuconazole and this may be to the detriment of grain yield. There was a trend towards lower yields at higher rates of all PGR's. In addition there may be greater anti-fungicidal properties associated with the application of tebuconazole despite no disease being evident in the crop.

In a similar trial in 2003-04 metconazole resulted in a significant height reduction at the two higher rates whereas the tebuconazole had little effect. As in the current trial there were no significant effects on grain yield.

Table 1: Effect of Growth Regulators on Plant Height and Grain Yield of Canola (Variety ATR Grace)

Treatment	height (cm)	yield (t/ha)
Nil	109.44	3.22
Tebuconazole 125 g/ha ai	107.78	3.32
Tebuconazole 250 g/ha ai	104.44	3.38
Tebuconazole 375 g/ha ai	100.56	3.26
Metconazole 35 g/ha ai	103.33	3.19
Metconazole 70 g/ha ai	96.11	3.12
Metconazole 105 g/ha ai	93.33	3.05
Uniconazole (all 3 rates)	91.67	3.22
LSD (5%)	5.92	NSD
CV	3.4	4.3

Conclusions:

Application of metconazole, tebuconazole and uniconazole (unreplicated) resulted in a reduction in plant height in canola and this was generally rate responsive. As in a previous trial conducted in 2003-04 there was little effect on grain yield.

In seasons where excess vegetative growth is a problem, increases in grain yield following treatment could be expected through improved harvest efficiency (less lodging and/or redirection of plant assimilates to the grain). Increases in grain yield per se may be optimistic. Trials with these treatments will continue next year with two application dates.

Further details:

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