3.3.2 BARLEY GROWTH REGULATOR TRIAL (LAKE BOLAC)

Location:
McMasters Paddock, Lake Bolac SFS Ltd site.

Researcher:
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Background:
Lodging of barley has been a significant harvesting, and yield loss issue. Growth regulators are registered for use in wheat and barley, and have a demonstrated ability to prevent lodging by reducing crop height and improving stem strength, with no negative effect on yield or grain protein.

Aim:
The aim of the trial was to evaluate the ability of two different growth regulators over a range of rates and timings to reduce crop height, and therefore reduce the problem of lodging in barley. Secondly to assess the potential yield and or protein variation following a single application of growth regulators.

Trial Method:
Gairdner barley was sown on the 18th of June 2002, at 100 kg/ha, with 115 kg/ha Pivot 13.16.0.7 (Lime had been applied to the paddock).

The first application of growth regulators were sprayed on the 11th of September – the barley was in the mid-tillering stage. Originally it was planned to apply the first timing at the 5 – 7 leaf stage, however due to seasonal conditions this was not possible. The second application was applied once the flag leaf of the barley was visible which occurred on the 10th of October. The following treatments have been applied to three replicated plots.

Treatments:
- Control
- Ethrel @ 750 ml/ha @ Tillering
- Cycocel @500 ml/ha + BS1000 wetter @ 0.1% @ Tillering
- Cycocel @ 1 L/ha + BS1000 wetter @ 0.1% @ Tillering
- Ethrel @ 750 ml/ha @ Flag leaf visible
- Ethrel @ 500 ml/ha @ Flag leaf visible
- Cycocel @ 500 ml/ha + BS1000 wetter @ 0.1% @ Flag leaf visible

The trial was harvested on the 5th of January 2003 using the DNRE trial plot equipment.

Ethrel is produced by Bayer CropScience. Active constituent is 480 g/L Ethephon (an anticholinesterase compound). It is registered for barley for anti-lodging @ 750ml/ha, to be applied once only between early to late boot stage, but before awns or spikes emerge. It penetrates the plant tissues, is translocated and progressively is decomposed to ethylene which effects the growth process. Cycocel is produced by BASF. Active constituent is 582 g/L Chlormequat present as Chlormequat Chloride. It is registered for dryland wheat @ 500ml/ha at the 5-7 leaf stage. It inhibits cell elongation causing shorter internodes and stronger stems.

Table 25: There was Variability Across All Plots Due to Soil Type/Moisture Content Differences and Disease Hot Spots.

Treatment	Average Yield t/ha	Average Protein	Price[9] /ha	Average Height at 29th Nov
Control	3.98[10]	14.9	$1,114	76 cm
Ethrel @ 750ml/ha @ tillering	4.39	14.9	$1,229	63 cm
Cycocel @ 500ml/ha @ tillering	4.63	14.7	$1,296	70 cm
Cycocel @ 1 L/ha @ tillering	4.57	15.1	$1,280	70 cm
Ethrel @ 750ml @ Flag leaf emerg	4.59	14.8	$1,285	50 cm
Ethrel @ 500 ml/ha @ Flag leaf emerg	4.24	14.8	$1,187	50 cm
Cycocel @ 500 ml/ha @ Flag leaf emerg	4.52	15.1	$1,266	70 cm

[9] *Barley = $280/T*
[10] *These plots had low yield for no apparent reason.*

Conclusion:
The Ethrel @ 500ml & 750 ml @ flag leaf emergence produced the shortest crops, and therefore in broad acre situations this product may be the most effective at reducing crop height and preventing lodging. The results suggest that there was no significant effect on yield or protein of the barley following any of the applications of growth regulators. The control plots however did have slightly less yield which is thought to be due to other factors. The height was reduced by some of the growth regulators, even in a year when the barely was relatively short compared to other years.

Currently the growth regulators used in the trial are commercially available, however there is no registration for Cycocel on barley.

The approximate cost for the chemicals at the respective rates are:

- Ethrel @ 500ml/ha = $10/ha
- Ethrel @ 750ml/ha = $15/ha
- Cycocel @500ml/ha = $8/ha
- Cycocel @ 1 L/ha = $15/ha

If you receive $280/t on farm for your barley you only have to save 35 kg/ha of barley to pay for the $10/ha (Ethrel @ 500 ml/ha) growth regulator chemical cost. This indicates growth regulators have the potential to significantly decrease the harvesting loss and therefore increase the return of broad acre barley crops.

Growth regulators also have the potential to significantly decrease the cost and time associated with harvesting lodged barley crops. This work confirms the ability of low cost growth regulator chemicals currently available to reduce crop height and have no effect on protein, and little, if any effect on yield.