10.5 TO DETERMINE THE INTERACTION BETWEEN PGR STRATEGY AND STROBILURIN FUNGICIDE APPLICATION - GNARWARRE

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Funding:
Grains Research and Development Corporation

Location & Variety:
Gnawarre, Victoria (SFS)
Gairdner (winter malt barley)

Summary:
Plant growth regulators significantly reduced the yield and quality of Gairdner malting barley, irrespective of which fungicide programme was employed.
The effects were statistically significant with the highest rate of the PGR Moddus (0.4l/ha) and those treatments where Moddus (0.2) and Chlormequat (1.5) were mixed together, though all treatments gave negative results. There was no lodging in the trial and PGR's only served to reduce crop height, an effect that in the drier finish reduced yield. The largest reductions in stem height (cm) correlated to the greatest reductions in yield. Under the strobilurin/triazole fungicide programme, Moddus significantly increased screenings compared to the chlormequat treated plots and the untreated. Thus PGR's were not cost effective in this experiment.

There was no interaction with the use of the fungicide programme, due to lack of disease and no manifestation of an extended grain fill period.

Objectives:
To assess the impact of strobilurin application on the need for PGR application. The individual objectives for the trial are as follows:

- To compare the performance of single applications of Plant growth regulator in crop canopies treated and untreated with strobilurin fungicide.
- To compare the lodging control and yield effect of Moddus and Chlormequat applied at early stem extension.

Background:
In New Zealand and Europe it has been noted that use of strobilurin fungicides can increase susceptibility to lodging, since disease free canopies that potentially increase grain fill duration have been noted to use more nitrogen and create larger crop canopies. If such crops are stiff strawed then this larger canopy maybe unaffected, however with weaker strawed crops larger canopies increase the lodging risk and thus the risk of not securing the benefits of disease control.

In this trial two plant growth regulator products were evaluated alone and in mixture to assess their impact on winter barley yield and quality, when combined with triazole and triazole/strobilurin based fungicide programmes.

Treatment list and trial design:
The trial had two variables

Table 79: PGR Treatment

Treatment	PGR applied at GS30 - 31
A1	Untreated
A2	Chlormequat 1.5 l/ha
A3	Moddus 0.2 l/ha
A4	Moddus 0.2 l/ha + Chlormequat 1.5 l/ha
A5	Moddus 0.4 l/ha
B1	Untreated
B2	Chlormequat 1.5 l/ha
B4	Chlormequat 1.5 l/ha + Moddus 0.2

With a limited number of treatments not all PGR treatments were tested with triazole fungicide programme i.e. Bumper only

Table 80: Fungicide Programme

	Sprayed at GS30 – 31	**Sprayed at GS39 - 49**
A	Bumper 250ml/ha + Az 500ml/ha	Bumper 250ml/ha + Az 500ml/ha
B	Bumper 250ml/ha	Bumper 250ml/ha

Results:

Table 81: Influence of PGR and Fungicide Program on the Yield (t/ha) and Grain Test Weight (kg/hl) of Winter Malting Barley

Plant Growth Regulator GS30-31 (ml/ha)		Triazole Fungicide Program		Strobilurin/Triazole Program	
treatment		**Yield t/ha**	**Test wt Kg/hl**	**Yield t/ha**	**Test wt Kg/hl**
A1	Untreated	5.77	67.8	5.79	67.8
A2	Chlormequat 1.5 l/ha	5.66	66.9	5.68	66.9
A3	Moddus 0.2 l/ha	----	----	5.77	65.2
A4	Moddus 0.2 l/ha + Chlormequat 1.5 l/ha	5.41	64.2	5.37	64.7
A5	Moddus 0.4 l/ha	----	----	5.42	64.0
LSD		**0.35**	**1.6**		
CV 4.3%					

The high rate of Moddus (0.4 l/ha) and the Chlormequat/Moddus mix significantly reduced the yield and grain test weight in this trial. Applications of lower rate Moddus and Chlormequat alone reduced the test weight, but it was only the Moddus 0.2 that significantly reduced test weight, all other reductions were not statistically significant.

Table 82: Influence of PGR and Fungicide Program on Crop Height (cm) and Screenings of Winter Malting Barley

Plant Growth Regulator GS30-31 (ml/ha)		Triazole Fungicide Program		Strobilurin/Triazole Program	
treatment		**cm**	**% Screen**	**cm**	**% Screen**
A1	Untreated	75	3.7	81	3.4
A2	Chlormequat 1.5 l/ha	74	3.6	75	3.0
A3	Moddus 0.2 l/ha	----	----	66	5.6
A4	Moddus 0.2 l/ha + Chlormequat 1.5 l/ha	63	3.7	61	4.0
A5	Moddus 0.4 l/ha	----	----	59	6.8
LSD			**1.6**		**1.6**
CV 4.3%					

The largest reductions in stem height (cm) correlated to the greatest reductions in yield. Under the strobilurin/triazole fungicide program, Moddus significantly increased screenings compared to the chlormequat treated plots and the untreated.