



EVALUATION OF THE ROLE OF PLANT GROWTH REGULATORS (PGRs) ON FUSARIUM HEAD BLIGHT INFECTION IN SPRING WHEAT

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KEY POINTS

- ▶ Use of a PGR did not significantly affect anther retention and FHB resistance level of the 5 tested cultivars
- ▶ Producers could benefit from the high levels of FHB resistance often found in taller cultivars, and use a PGR to manage plant height and lodging, without increased risk of FHB infection

BACKGROUND

- Cultivars with the most effective genetic FHB resistance are often tall and prone to lodging
- Presence of a semi-dwarfing gene within a cultivar increases the frequency of anther retention. This could contribute to FHB susceptibility by providing an initiation site for infection
- The objective of this study was to determine the effect of PGRs (Manipulator™ and Ethrel™) on five spring wheat cultivars that differ in height and level of FHB resistance

MATERIALS & METHODS

- Main treatment – combination of PGR application (either Manipulator™ or Ethrel™) and FHB inoculation
- Subplot treatment – cultivar



Table 1. Five spring wheat cultivars used in field experiments conducted in Winnipeg and Carman, MB, in 2019 and 2020, with wheat end-use class, height, FHB resistance level, and the presence of semi-dwarfing alleles.

Cultivar	End-Use Class ^a	Height (cm) ^b	FHB Resistance ^c	Semi-Dwarfing Allele (<i>Rht-B1</i> or <i>Rht-D1</i>) ^d
AAC Tenacious	CPSR	Tall (101)	R	None
AAC Penhold	CPSR	Short (71)	MR	<i>Rht-D1b</i>
AAC Brandon	CWRS	Intermediate (81)	MR	<i>Rht-B1b</i>
AAC Cameron	CWRS	Tall (94)	I	None
Prosper	CNHR	Intermediate (84)	I	<i>Rht-B1b</i>

^a CPSR = Canada Prairie Spring Red, CWRS = Canada Western Red Spring, CNHR = Canada Northern Hard Red

^b Plant Height, from Seed Manitoba 2018

^c FHB Resistance Level where R = Resistant, MR = Moderately Resistant, I = Intermediate

^d Information sourced from Dr. Santosh Kumar – Agriculture and Agrifood Canada



RESULTS

- Combined data showed Ethrel™ reduced plant height by 5 cm, while Manipulator™ only slightly reduced plant height
- PGR application did not have a significant effect on anther retention or FHB infection in any of the 5 tested cultivars
- **Results from this study indicate that growers could choose to grow a taller, FHB resistant variety and use a PGR to control plant height and reduce lodging risk**

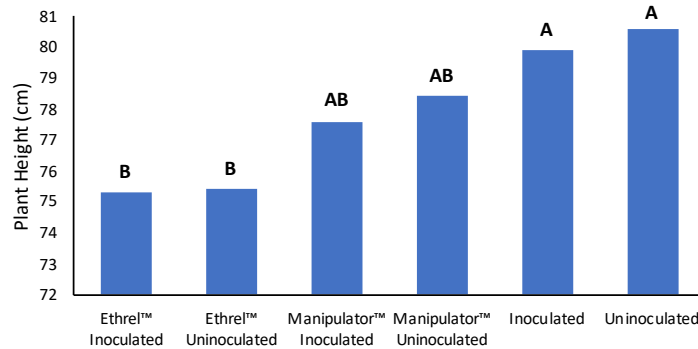


Figure 1. Least square means for plant height across all five cultivars and four growing environments.

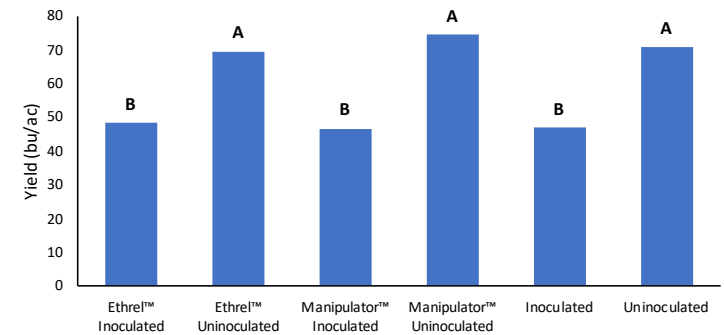


Figure 2. Least square means for grain yield across all five cultivars and four growing environments.

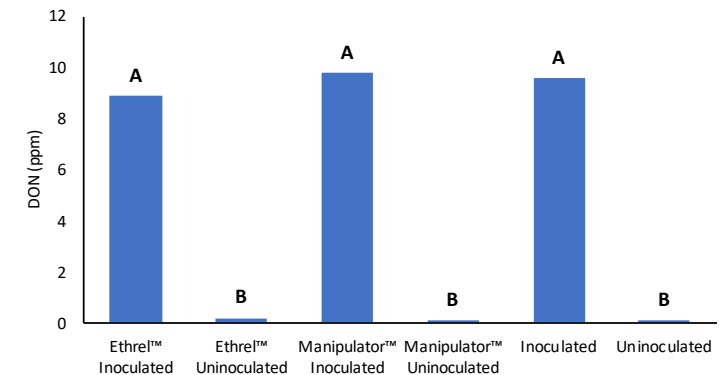


Figure 3. Least square means for deoxynivalenol (DON) content across all five cultivars and four growing environments.



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