Plant Growth Regulator (PGR) to Reduce Height and Lodging

Overview: A plant growth regulator (Palisade) was applied at 12 oz/acre after jointing but prior to flag leaf emergence from 2016-2018. Trials included 3-4 replications of treated and non-treated strips sprayed with cooperator equipment along the full length of the field. Harvested strips were weighed in a weigh wagon and sampled to measure moisture, test weight, and protein content.

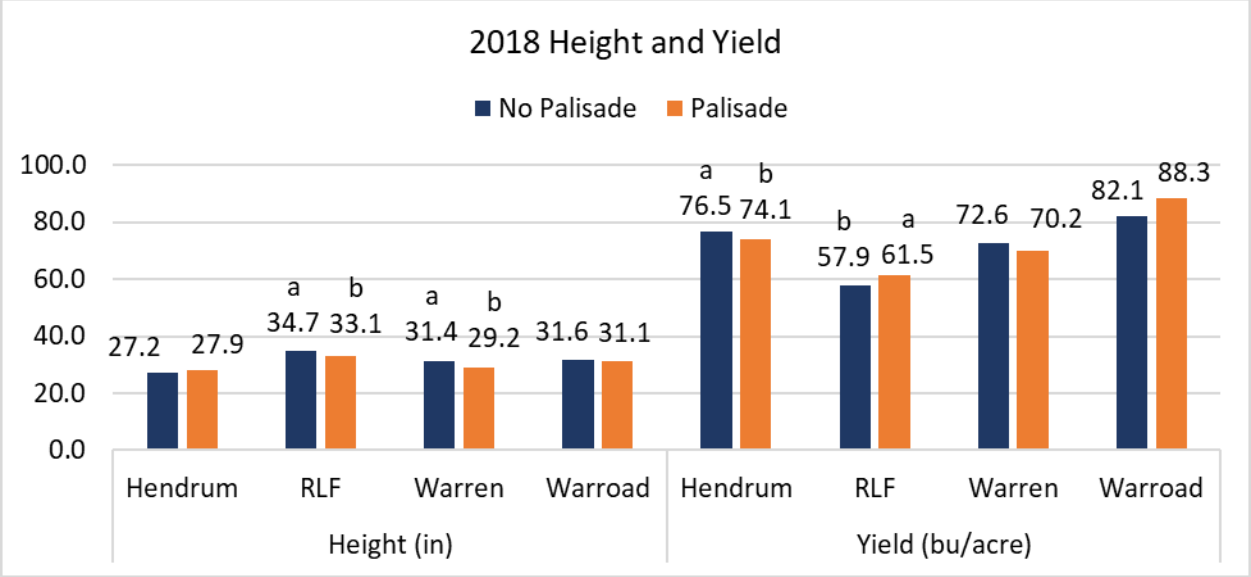

Figure 1. Height and yield at 4 locations in NW MN in 2018. Differing lowercase letters indicate significant differences between treatments at the 90% confidence level.

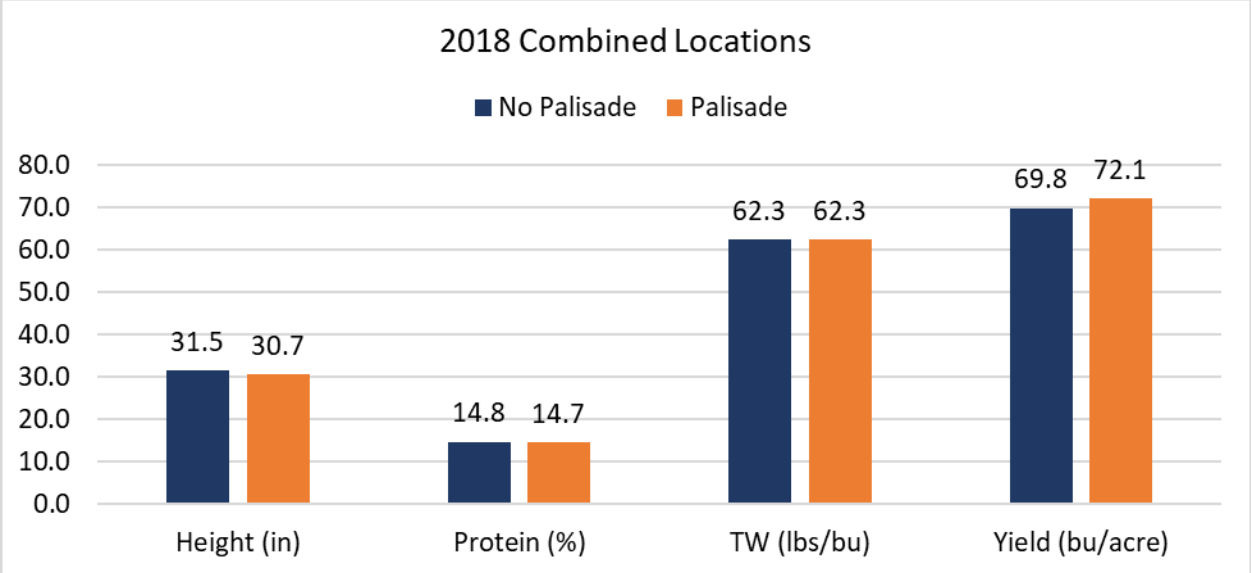

Figure 2. Results from 2018 combined across 4 locations in NW MN. Differing lowercase letters indicate significant differences between treatments at the 90% confidence level.

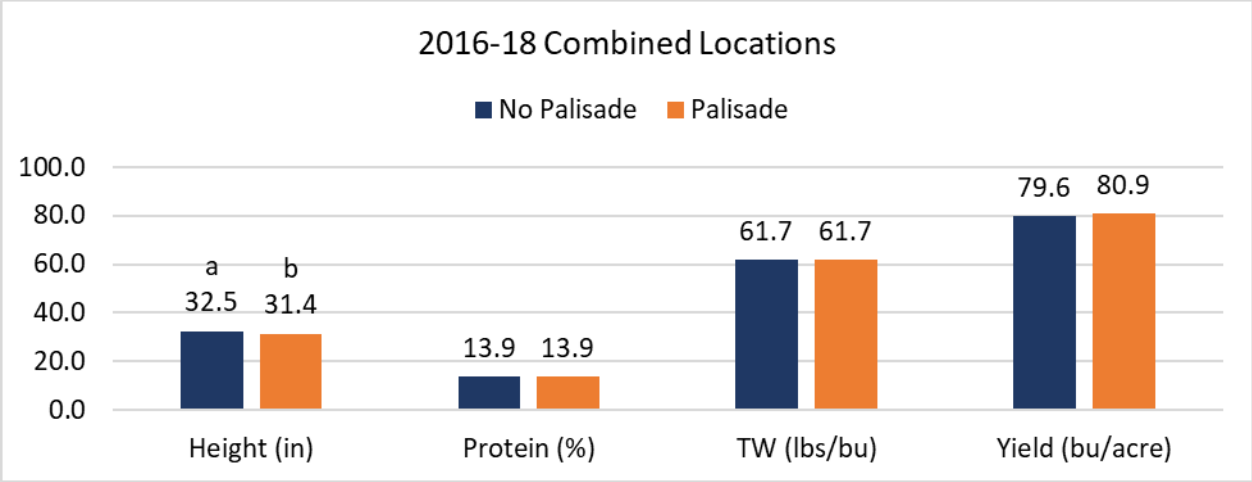

Figure 3. Results from 2016-2018 combined across 15 locations in NW MN. Differing lowercase letters indicate differences between treatments at the 95% confidence level.

- Differences in plant height between treatments varied by environment. Red Lake Falls was the only location where moderate lodging was observed in the trial. Crop height was reduced by 1.6 in, which likely led to the yield increase of 3.6 bu/acre at this location.

- In Warren, crop height was reduced by 2.2 in, but yield was not significantly different between treatments.

- In Hendrum, yield was reduced by 2.4 bu/acre with the PGR application. This may have been due to a lack of rain and stressful growing conditions following the application (Figure 1).

- Overall, there were no differences in plant height, test weight, protein content, or yield between treated and non-treated plots in 2018. In the combined analysis of all locations from 2016-2018, the PGR application reduced plant height by 1.3 in, but did not increase protein content or yield.

Economic analysis of Palisade application for 2018 locations and combined across all years.

Location	Hendrum	RLF	Warren	Warroad	2018	2016-18
Variety	Valda	Lang	Valda	Spitfire	Combined	Combined
No Palisade	76.53	57.86	72.55	82.05	69.80	79.65
Palisade	74.12	61.48	70.17	88.29	72.13	80.93
Yield gain/loss	- 2.41	3.62	- 2.38	6.23	2.33	1.28
$ Yield gain/loss	$ (13.71)	$ 20.61	$ (13.56)	$ 35.47	$ 13.25	$ 7.27
Profit/loss*	$ (33.71)	$ 0.61	$ (33.56)	$ 15.47	$ (6.75)	$ (12.73)

*Calculated at $5.69/bu wheat, $12/acre chemical cost, and $8/acre application cost.

Conclusions: At a price of $5.69/bu, a 3.7 bu yield increase is needed to pay for cost of the application (Table 1). We conclude that in most cases it would be more economical to reduce lodging by choosing a variety with good straw strength and by planting at a seeding rate closer to 1 million plants per acre, especially if there is a risk of reduced yield following the application due to stressful growing conditions.