

The Effect of a Late-season Fungicide Application on Winter Wheat Performance

Mike Ostlie and Blaine G. Schatz

Winter wheat acres are at historic lows in the United States due to relatively low profit margins and corn and soybean acres moving westward across the Great Plains. However, recent dry and droughty weather has raised concern about water availability for late-season crops. Winter wheat represents an opportunity to take advantage of the early-season moisture during dry years. Management of winter wheat needs to be considered prior to growing the crop. Factors such as stubble type and height, fertility, and pest management programs may be different than spring wheat. Two important factors to consider are wheat variety and the use of a fungicide program.

From 2013-2017, a winter wheat variety trial was conducted at Carrington. This trial consisted of 20-30 varieties each year. Each year, half the trial received a fungicide application at anthesis. The fungicide was either Proline or Stratego. Head disease pressure was low in each of the years under evaluation. In 2016, there was a major hail event near crop maturity. No data were used from that year. Varieties within the trial changed from year to year, nevertheless, there were 13 varieties consistently present for the duration of the study, which will be the focus of this report.

In the simplest comparison, Table 1 demonstrates a nearly 6 bu/ac increase in winter wheat yield by using a late-season fungicide. Grain protein was unaffected by the use of a fungicide. That could be the end of the story, however, not every variety had the same increase. Table 2 lists the average yield of each of the 13 varieties for the duration of the study with and without a fungicide. When looking at the difference between fungicide and no fungicide there was a 1 to 12 bu/ac difference. Some varieties responded very well to the fungicide treatment while others were nearly stagnant. Only Lyman Accipiter, Overland, and Flourish had a consistent and statistically significant yield increase across all sites. Protein content was not affected by fungicide for any variety. While *Fusarium* head blight was the target for the fungicide strategy of this trial, none of these environments had infection levels that would typically be of concern. Instead, it is likely that the fungicide was more effective at protecting the flag leaf and lower leaves from tan spot (even low levels) and possibly provided some general plant health benefits. The tan spot pathogen is our most prevalent leaf spot disease of wheat and all our winter wheat varieties are generally susceptible. In comparing with the *North Dakota Hard Winter Wheat Variety Trial Results for 2018 and Selection Guide (A1196-18)* <https://www.ag.ndsu.edu/publications/crops/north-dakota-hard-winter-wheat-variety-trial-results>, there is no apparent and consistent correlation between disease susceptible varieties and fungicide response.

Winter wheat yield with and without fungicide treatment.

Treatment	Yield bu/ac	Protein %
Fungicide	59.2	13.95
No Fungicide	53.6	13.90
LSD (0.05)	2.2	NS



A stripe rust resistant (left) vs. susceptible (right) variety.

Table 2. Average performance of each variety across years, along with the effect of applying a fungicide.

Variety	Yield		Difference ¹
	No Fungicide	Fungicide	
Jerry	58.2	62.6	4.4
Lyman	41.5	53.3	11.8
Peregrine	59.1	60.6	1.4
WB-Matlock	61.1	62.3	1.2
AC Broadview	54.6	56.7	2.1
Decade	48.9	55.2	6.2
Accipiter	58.9	67.6	8.7
Overland	48.2	57.1	8.9
SY Wolf	53.1	58.3	5.2
Ideal	55.3	60.0	4.8
Moats	54.4	59.2	4.8
AC Emerson	53.9	56.1	2.2
Flourish	49.8	60.6	10.8
LSD (0.05)	4.7	4.7	7.7

¹The difference represents the yield of the fungicide treated plots minus no fungicide.

Winter wheat variety selection is important for many reasons. Fungicide response doesn't have to be one of those reasons. However, it would be important to know if the selected variety has a chance to provide a substantial return on investment or not. But, as always, keep track of the crop stage, scout for diseases, and monitor the weather to ensure the right fungicide choice is made.