

Fungicide Treatment Increases Wheat Yield and Test Weight

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Fusarium Head Blight (Scab) continues to be a persistent problem for small grains in the United States, particularly in regions with frequent rainfall and warm temperatures. In 2024, these conditions were especially conducive to scab development in North Dakota. As part of a grant through the US Wheat & Barley Scab Initiative, the CREC conducted a wheat fungicide control trial under irrigation to assess potential solutions.

The trial aimed to evaluate two wheat varieties - one susceptible and one moderately resistant - and four different commercial fungicide products for scab control (Table 1). The experiment was planted on May 16, and corn spawn inoculum was spread across the plots twice: first on June 25 and again on July 2. Fungicides were applied at early anthesis (Feekes 10.51) on July 12. The trial was rated three weeks after inoculation, shortly before the ripening color change. After harvest on September 6, test weight and protein data were collected. Disease ratings, including incidence (0-9 scale) and severity (percentage spread within a spike), were generated and samples were submitted for DON testing. These results will be included in future presentations and reports.

Table 1. Trial tested both variety effect and fungicide effect on wheat yield.

Factor Category	Specific Factor
Wheat Varieties	ND Thresher (moderately resistant)
	WB9479 (susceptible)
Fungicide Treatments	No fungicide
	No inoculant, No fungicide
	Prosaro® (prothioconazole + tebuconazole) at 6.5 oz/a
	Miravis Ace® (propiconazole + pydiflumetofen) at 13.7 oz/a
	Prosaro Pro® (prothioconazole + tebuconazole + fluopyram) at 10.3 oz/a
Sphaerex® (metconazole + prothioconazole) at 7.3 oz/a	

The environmental conditions in 2024 were highly favorable for scab development, with mean incidences of 2.65 for ND Thresher and 2.4 for WB9479 in the inoculated untreated controls. Scab significantly impacted both yield (Figure 1) and test weight (Figure 2) in both varieties. In ND Thresher, fungicide treatments led to a significant increase in yield compared to the inoculated check, though no significant difference was observed when compared to the uninoculated check. Among the fungicides, Miravis Ace® was the most effective in improving yield. In the susceptible variety WB9479, no significant differences were observed between the inoculated or uninoculated checks, although fungicide treatment did result in increased yield, with Miravis Ace® being the only fungicide to show a significant improvement.

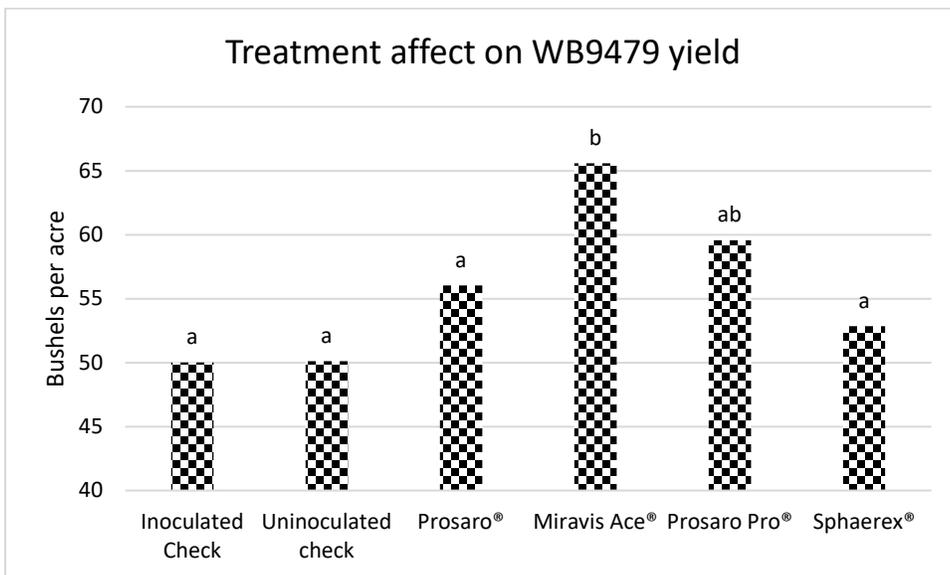
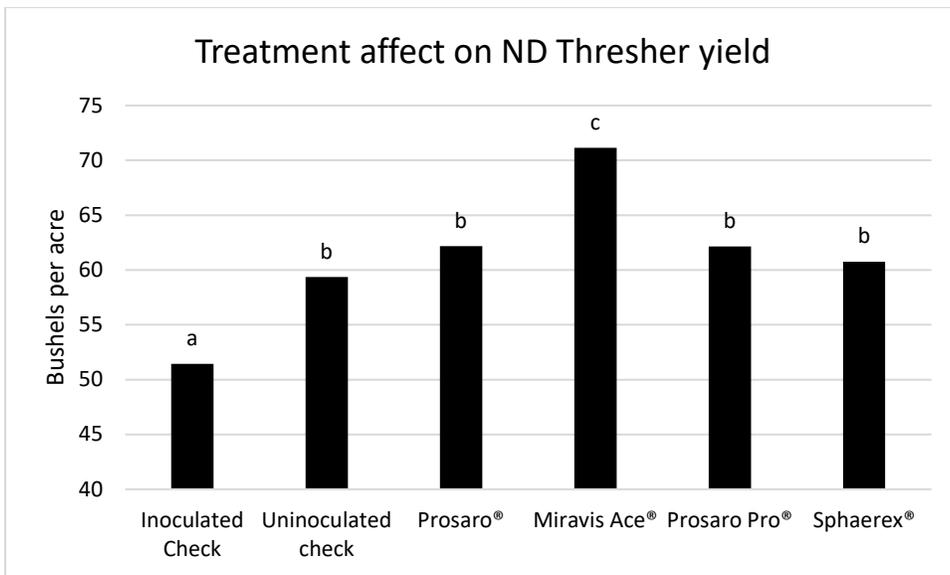
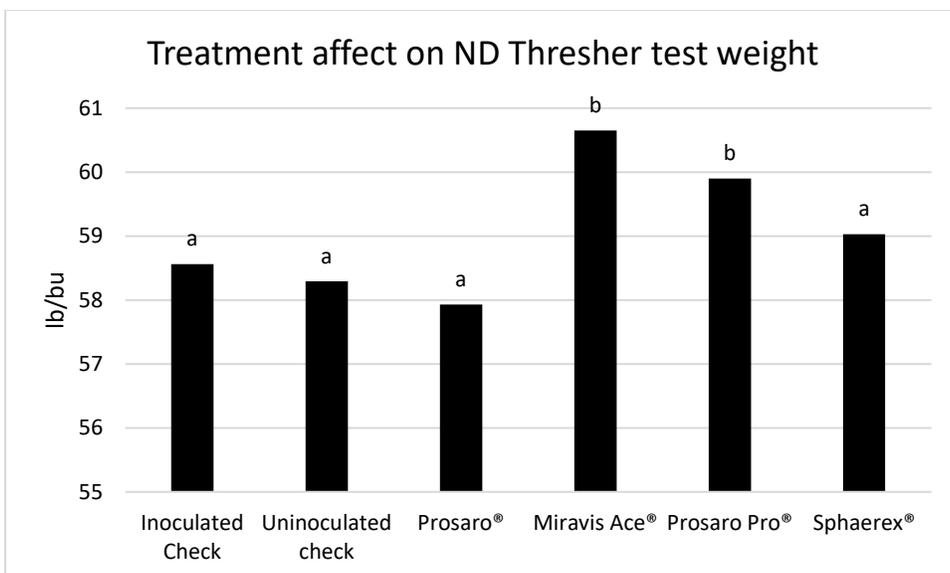


Figure 1. Fungicide treatment improves yield under high scab disease pressure. Different letters on each indicates statistically different at alpha = 0.10.



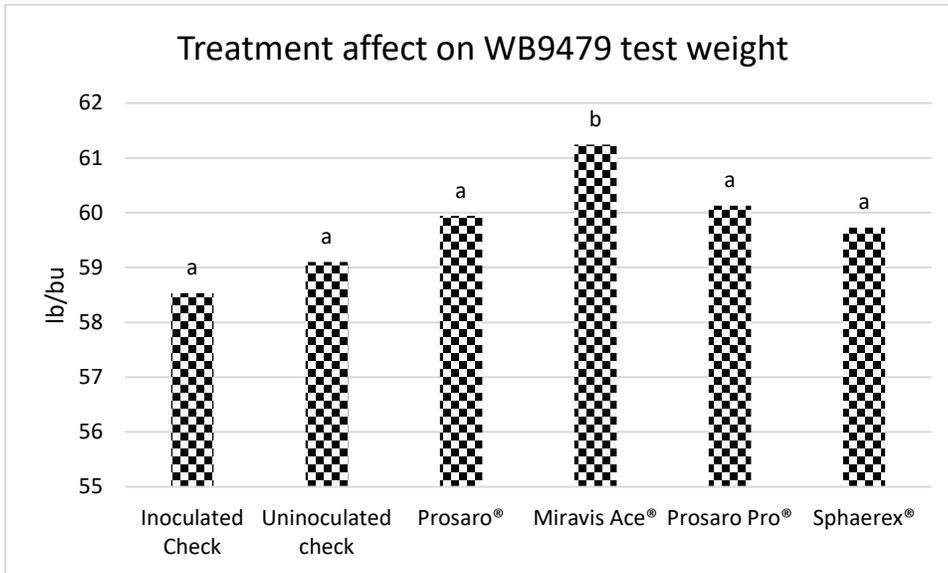


Figure 2. Fungicide treatment improves test weight under high scab disease pressure. Different letters on each indicates statistically different at alpha = 0.10.

Test weight was also affected by scab infection (Figure 2). In ND Thresher, only two treatments - Miravis Ace® and Prosaro Pro® - resulted in significantly higher test weights than the other treatments. In WB9479, only Miravis Ace® significantly increased test weight.

In conclusion, Miravis Ace® proved to be the most effective fungicide, significantly improving both yield and test weight in both the resistant and susceptible lines. Notably, planting a resistant variety offers some protection in years with low disease pressure, as evidenced by the yield differences in ND Thresher. Future analyses will focus on additional seed characteristics, which will be generated and reported later.

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