Evaluation of Fungicides for Sunflower Rust Management 2024 and 2025

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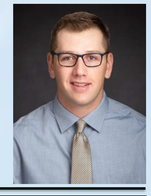


Introduction

- Sunflower rust (caused by *Puccinia helianthi*) is among the most common and destructive sunflower diseases in the USA (Markell et al. 2009).
- Fungicide applications most effectively manage rust when made at the economic threshold of 1% severity on the upper four fully-expanded leaves at or before growth stage R5.
- Fungicides available to USA sunflower growers change over time, and periodic evaluation of efficacy provides important information to growers that help them make the best decisions for their farms.
- The objective of this study was to evaluate efficacy of multiple fungicides.

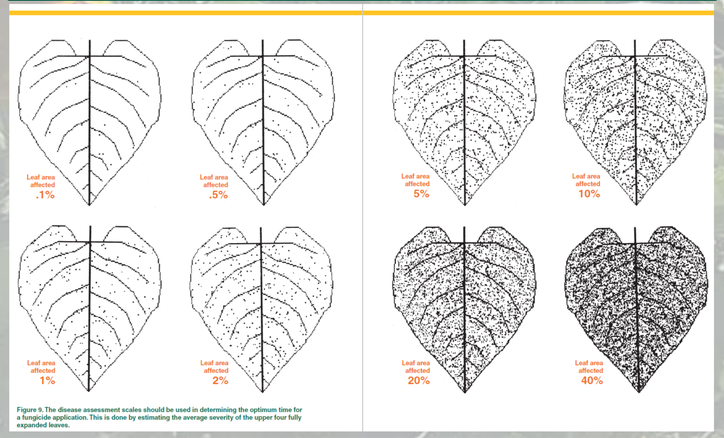
Materials & Methods

- This trial was conducted in Casselton, ND (2024) and Prosper, ND (2025) in a Randomized Block Design with six treatments replicated four times each year.
- Labeled fungicides were chosen based on product availability to growers and diversity of mode of action (Table 1).
- The trial was planted into four-row plots spaced 30 inches and 20 feet long.
- The experiment was inoculated with urediniospores at canopy closure with a field-collection of *P. helianthi* originally collected from North Dakota in 2023 and 2024 in a soltrol suspension using a leaf blower.
- Fungicides were applied at R5 (two weeks after pathogen inoculation) using a hand-held 3 nozzle boom above the sunflower heads with flat fan nozzles at a rate of 20 gal/acre. A non-ionic surfactant was included in all treatments.
- The experiment was evaluated for rust severity by visually examining ten arbitrarily-selected leaves from the upper canopy in each plot using the severity scale (Figure 3; Friskop et al. 2011). Evaluation was conducted two times for each respective year, beginning two weeks after fungicide application.

Figure 1.

a. Prosper trial at growth stage R5
b. Leaf blower used for inoculation
c. Boom sprayer used for fungicide application

Figure 3.
Sunflower rust severity reference rating chart



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Results

Table 1. Treatment number, treatment name, active ingredient, mode of action, and rate utilized for this study are displayed below

Treatment Name	Active Ingredient	Mode of Action and Group	Rate
Non Treated Control (Check)	-	-	-
Onset	Tebuconazole	DMI (3)	4 fl oz/a A
Quadris	Azoxystrobin	QoI (11)	6 fl oz/a A
Luna Experience	Fluopyram + Tebuconazole	SDHI (7) + DMI (3)	9 fl oz/a A
Priaxor	Fluxapyroxad + Pyraclostrobin	SDHI (7) + QoI (11)	4 fl oz/a A
Headline	Pyraclostrobin	QoI (11)	6 fl oz/a A

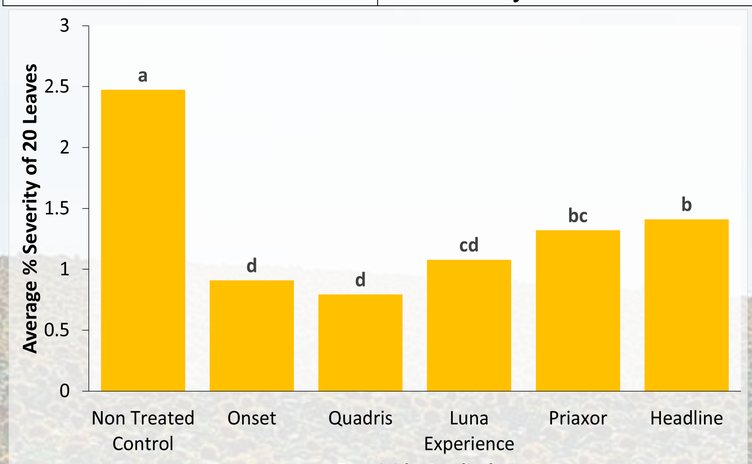

Figure 4. 2024 and 2025 mean rust severity for fungicide treatment at Growth Stage R5

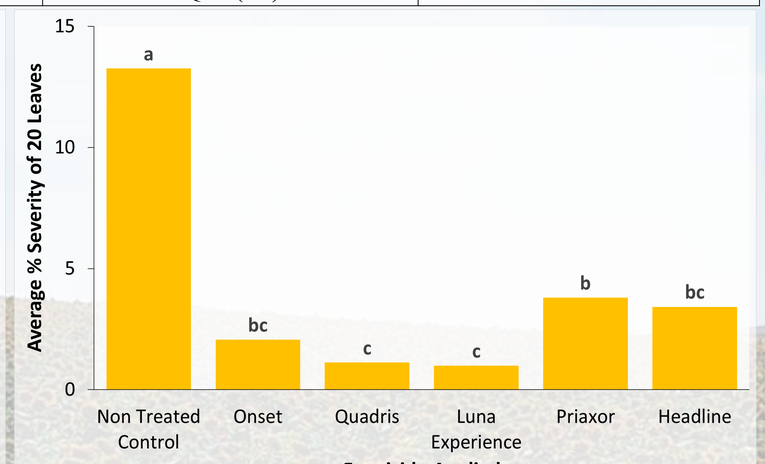

Figure 5. 2024 and 2025 mean rust severity for fungicide treatment at Growth Stage R6/R7

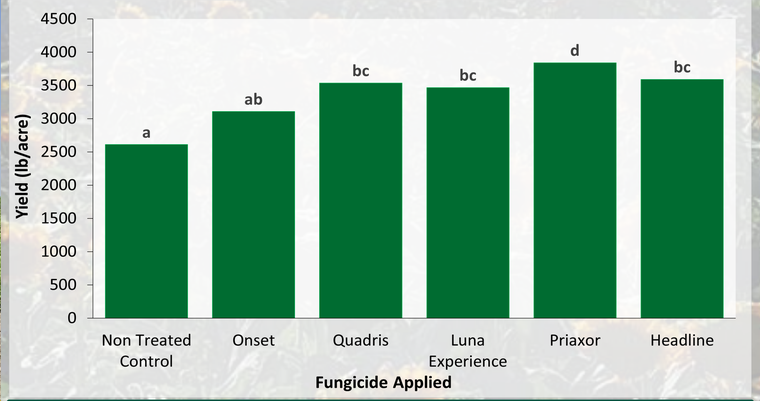

Figure 6. Mean Yield (lb/acre) for 2025

Conclusion/Summary

- High disease severity occurred on the non treated control, demonstrating the rust epidemic was very successful.
- Rust severity on all treatments was significantly lower than on the non-treated control, demonstrating that all fungicides tested were efficacious on rust for both years.
- Statistical differences among treatments occurred at both the R5 and R6/R7 ratings.
- Rust severity on the non-treated control increased from approximately 2.5% to nearly 13.5% from R5 to R6/R7, demonstrating how explosive rust can be. However, relative severity increases of treatments were relatively low in the same time frame (roughly 1 or 2% to 1.5 to 4%), demonstrating how effectively fungicides can limit rust.
- In 2025 all fungicides, with the exception of Onset, preserved yield when compared to the non treated control. Priaxor had the highest yield of all treatments, however, it did not have the lowest mean % severity during either rating period.

Acknowledgements:

We would like to thank The National Sunflower Association, Brent Hulke and his team, the staff at the NDSU Agronomy seed farm in Casselton, Caitlin Bardwell, Gabe Lakoduk, and Rick Hatchett for assisting with this project.

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