Evaluation of Fungicides for Sunflower Rust Management

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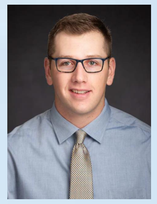


Introduction

- 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 in a Randomized Block Design with six treatments replicated four times.
- Labeled fungicides were chosen based on product availability to growers and diversity of mode of action (Table 1).
- The trial was conducted using hybrid CHS-RH 609 CLP 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 in a soltrol suspention 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). Evaluation was conducted three times, beginning two weeks after fungicide application, Only R5 and R6/7 evaluations are reported.
- Yield data was not collected due to a late planting date of mid June.

Figure 1.
a. Planting trial
b. Pathogen increase
c. Collected pathogen for inoculation

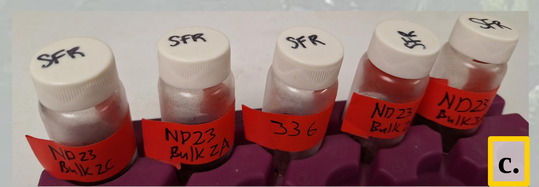
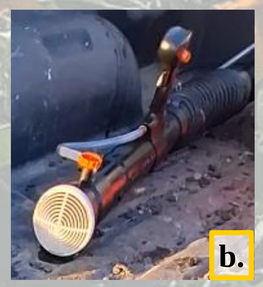


Figure 2.
a. Trial at canopy closure
b. Inoculation equipment



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 & Rate Unit
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

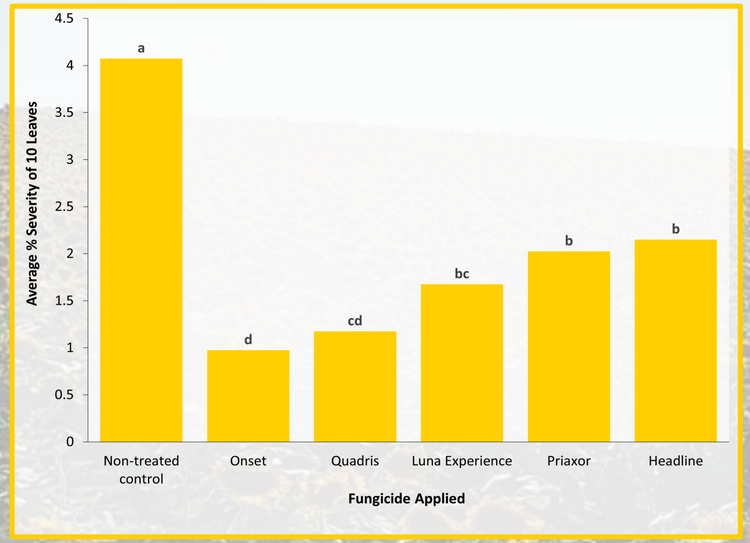


Figure 4. Mean rust severity of 10 leaves by fungicide treatment at Growth Stage R5

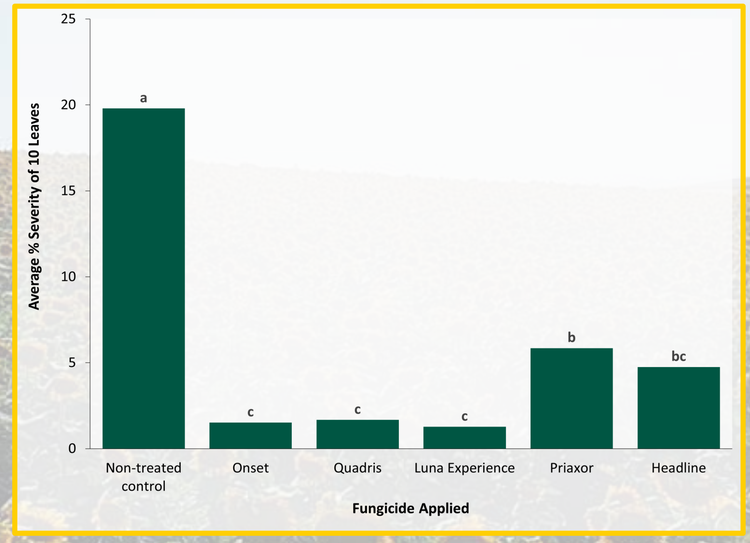
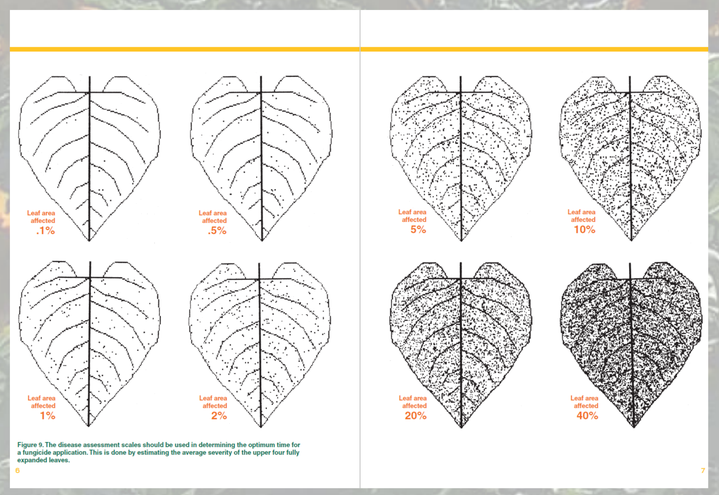


Figure 5. Mean rust severity of 10 leaves by fungicide treatment at Growth Stage R6/R7

Figure 3.
Sunflower rust severity reference rating chart
(Friskop et al. 2011)



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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.
- Statistical differences among treatments occurred at both the R5 and R6/R7 ratings.
- Rust severity on the non-treated control increased from approximately 4% to nearly 20% 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 5%), demonstrating how effectively fungicides can limit rust.
- Yield could not be taken due to a late planting date of mid June.

Literature Cited:

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