

# Yellow rust control in winter wheat

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## Introduction

In spring of 2024, a field trial was established to evaluate efficacy of three different fungicides to control yellow rust in winter wheat. Yellow rust is a significant disease that can reduce wheat yields and grain quality if not properly managed. The study focused on herbicides Osprey Xtra (mesosulfuron-methyl + iodofenoxifen-sodium), Huskie (pyrasulfotole + bromoxynil), and Brox-M (bromoxynil + MCPA), applied individually and in tank mixes with fungicides Prosaro Pro (tebuzonazole + prothioconazole + fluopyram), Tilt (propiconazole), Delaro (prothioconazole + trifloxystrobin), and Proline Gold (fluopyram + prothioconazole) – products containing fluopyram are not currently labeled for use in wheat in the United States.

The use of emulsifiable concentrates with high loads of petroleum distillates, like Brox-M, can reduce crop safety in complex mixtures. Furthermore, yellow rust prevalence varies from year to year but knowing if there is antagonism between the fungicides and business-as-usual herbicide tank mix is important for producers. Therefore, the objective of this study was to determine (1) crop injury, (2) yellow rust control, and (3) mayweed chamomile (*Anthemis cotula*) control using different fungicide tank mixes.

## Methods

The study was established in winter wheat field near Pullman, WA. Treatments were applied when wheat was 3 to 5 tiller and actively growing (Table 1). Treatments were applied with a CO<sub>2</sub> powered backpack sprayer and a 5 ft boom with 3 Teejet 11002VS nozzles with an effective spray pattern of 8 ft and calibrated to deliver 15 gallons per acre (GPA). The study was conducted in a randomized complete block design with 4 replications. Plots were 12 ft wide by 20 ft long. Treatments were assessed for crop response, yellow rust control, and Mayweed chamomile control at 10, 25, and 40 days after treatment (DAA). Plots were harvested with a Wintersteiger small plot combine with a 5-foot header. Data were subject to ANOVA using the Agricultural Research Manager software (Ver. 2024).

**Table 1.** Treatment application details.

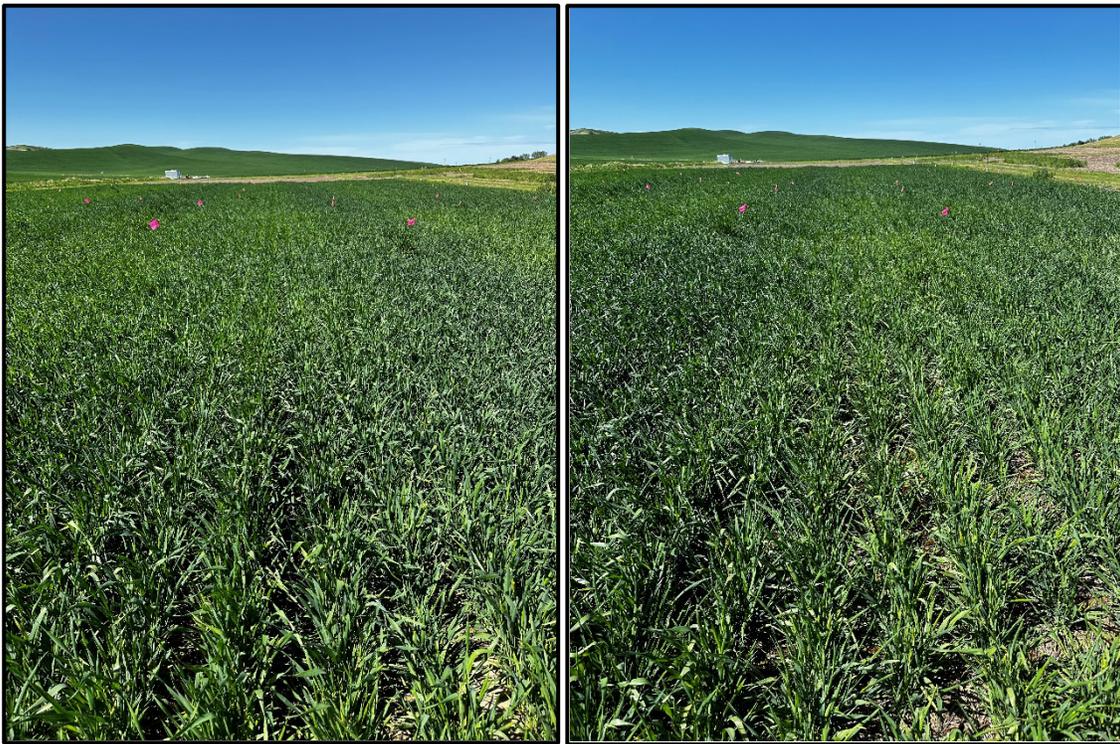
Study Application	
Date	5/3/2024
Application volume (GPA)	15
Timing	Postemergence
Crop Stage	3 to 5 Tiller
Air temperature (°F)	56
Wind velocity (mph, direction)	5, SSE
Relative humidity (%)	47

## Results

The field that the trial was located did not have any detectable yellow rust in the 2024 growing season, so rust control ratings are not presented here. All treatments completely controlled mayweed chamomile when assessed at 25 and 40 DAA (data not shown). Some variability was observed at earlier stages (10 DAA), where control ranged from 17.5% to 80% depending on the treatment and the speed of the herbicide activity.

Phytotoxicity assessments indicated variable visible crop injury in treatments that included all three fungicides at the higher rates. Injury was primarily stunting and yellowing, with no significant impact on yield noted in any treatments. Yield data indicated that treatments did not significantly differ in bushel per acre (bu/A) outputs when compared to nontreated plots. Yields ranged from 210 bu/A (Osprey + Huskie + BROX + Delaro 7.8 oz/A) to 300 bu/A (Osprey + Huskie + BROX + Proline Gold 6.8 oz/A). Proline Gold, Prosaro, and Tilt contributed to the highest injury rates last year. We saw higher injury overall in 2023 compared to 2024.

The application of herbicides and fungicides in mixture is a common practice. Under adverse conditions such mixtures can result in significant injury. Ideally, applications of fungicides and herbicides should be separated. If a complex mixture is being considered, choosing the least injurious fungicide partner is advised to minimize potential yield loss.

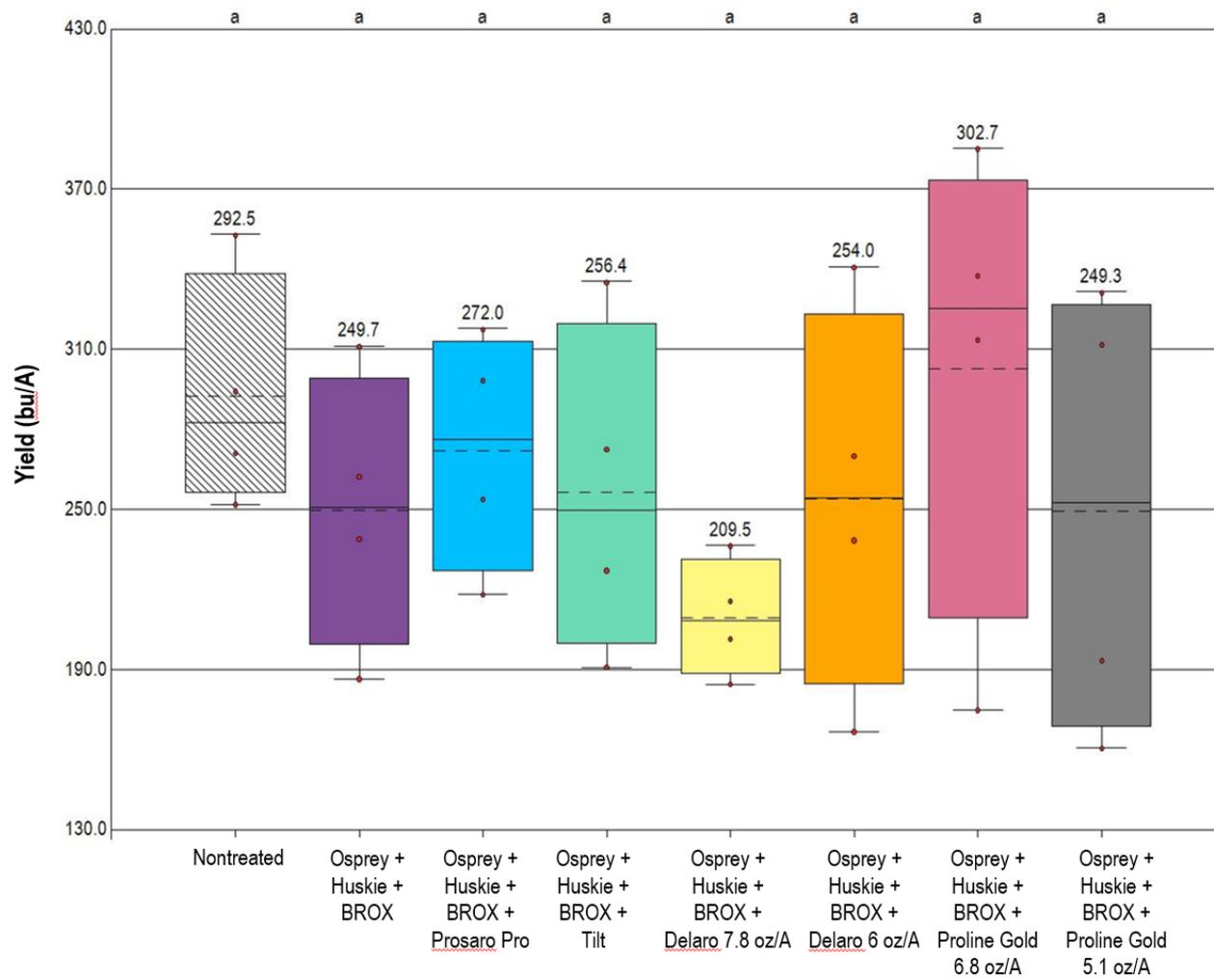


**Figure 1.** Nontreated plot (left) compared to treatment that included Osprey XTRA + Huskie + BROX-M + Prosaro Pro. There is slight stunting to the entire plot.

**Table 2.** Crop injury of winter wheat in response to fungicide tank mixes. Discoloration was not significantly different between treatments (alpha = 0.05).

Treatment <sup>1</sup>	Rate		Discoloration	Discoloration
			(%)	(%)
			5/13/2024	5/28/2023
Osprey XTRA	4.75	oz/A		
Huskie	13.5	oz/A	0	0
BROX-M	16	oz/A		
Osprey XTRA	4.75	oz/A		
Huskie	13.5	oz/A	15	5
BROX-M	16	oz/A		
Prosaro Pro	6.75	oz/A		
Osprey XTRA	4.75	oz/A		
Huskie	13.5	oz/A	5	0
BROX-M	16	oz/A		
Tilt	4	oz/A		
Osprey XTRA	4.75	oz/A		
Huskie	13.5	oz/A	15	5
BROX-M	16	oz/A		
Delaro	7.83	oz/A		
Osprey XTRA	4.75	oz/A		
Huskie	13.5	oz/A	10	0
BROX-M	16	oz/A		
Delaro	6.02	oz/A		
Osprey XTRA	4.75	oz/A		
Huskie	13.5	oz/A	5	0
BROX-M	16	oz/A		
Proline Gold	6.84	oz/A		
Osprey XTRA	4.75	oz/A		
Huskie	13.5	oz/A	0	0
BROX-M	16	oz/A		
Proline Gold	5.13	oz/A		

<sup>1</sup>All treatments included NIS (0.25% v/v) and UAN (4 pt/A).



**Figure 1.** Yield of winter wheat in response to different fungicide tank mixes.

## **Off-Label or Experimental-Use Disclaimer**

**Some of the pesticides discussed in this presentation were tested under an experimental use permit granted by WSDA. Application of a pesticide to a crop or site that is not on the label is a violation of pesticide law and may subject the applicator to civil penalties up to \$7,500. In addition, such an application may also result in illegal residues that could subject the crop to seizure or embargo action by WSDA and/or the U.S. Food and Drug Administration. It is your responsibility to check the label before using the product to ensure lawful use and obtain all necessary permits in advance.**