Tolvera® safety and efficacy in spring wheat

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Introduction

In 2024, a field trial was conducted to assess the performance of Tolvera in spring wheat. Tolvera, registered in Washington earlier this year, is specifically designed to target broadleaf weeds, making it a valuable tool for wheat growers seeking new modes of action for effective weed control. The goal of this trial was to evaluate the safety and efficacy of Tolvera at various application rates, both alone and in combination with other herbicides.

Methods

The study was established at the Palouse Conservation Field Station near Albion, WA in spring 2024. Treatments were applied when weeds were 2 to 4 inches and wheat was 2 to4 tiller and both were actively growing (Table 1). Treatments were applied with a CO_2-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 10 ft wide by 30 ft long. Treatments were assessed for crop response and weed control 8, 15, and 26 days after treatment. 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	6/6/2024
Application volume (GPA)	15
Timing	Postemergence
Crop Stage	3 to 5 Tiller
Air temperature (˚F)	72-74
Soil temperature (˚F)	70
Wind velocity (mph, direction)	2-3, SW
Relative humidity (%)	40

Results

All treatments were effective at controlling Mayweed chamomile (*Anthemis cotula*), with Tolvera + NIS having the lowest numerical control at 85% (Table 2). Control of common lambsquarters (*Chenopodiam album*) varied but treatments were similar. Huskie and Talinor treatments completely controlled common lambsquarters. Prickly lettuce (*Lactuca seriola*) control was not different between treatments, with all herbicide treatments having 100% control (data not shown).

Minor crop injury, including chlorosis and stunting, was observed with certain treatments (Figure 1). Injury was most pronounced with combinations involving Tolvera + OpenSky, Tolvera + Axial Star, or Tolvera at 14 oz/A but did not significantly impact yields. Yield ranged from 45 bu/A (Tolvera + OpenSky, Tolvera + Axial Star) to 85 bu/A (Tolvera at 14 oz/A), with higher weed control generally correlating with greater yield. Both OpenSky and Axial Star have high loads of petroleum distillates, and combined with more aggressive surfactant packages may be injurious when used with Tolvera.

The trial demonstrated that Tolvera, especially at higher rates (14 oz/A), was effective in controlling problematic weed species in spring wheat. The importance of selecting the right herbicide combination as well as surfactant is underscored by the need to balance weed control efficacy with crop safety. Future work will focus on mixtures with other herbicides and surfactants to optimize activity and crop safety.

Figure 1. Nontreated plot (left) and Tolvera + OpenSky + Activator 90 (right).

Table 2. Crop injury and weed control in response to increasing rates of Tolvera alone and in tank mix. Means with the same letters are not significantly different from each other (alpha = 0.05).

			Chlorosis (%)		Injury (%)	Mayweed Control (%)	Lambsquarters Control (%)	Yield (bu/A)
Treatment	**Rate**		**6/14/2024**		**6/21/2024**	**7/2/2024**	**7/2/2025**	**8/29/2024**
Tolvera	11	oz/A	10	ab	5	95	90	72
MSO	0.5	%v/v						
Tolvera	14.7	oz/A	15	a	5	95	97	82
MSO	0.5	%v/v						
Tolvera	11	oz/A	15	a	5	90	97	44
OpenSky	16	oz/A						
Activator 90	0.5	%v/v						
Amsol	60	oz/A						
Tolvera	11	oz/A	10	ab	0	97	95	78
Axial Star	16.4	oz/A						
Tolvera	11	oz/A	10	ab	0	92	97	84
Harmony SG	0.3	oz/A						
Express 50 SG	0.3	oz/A						
MSO	0.5	%v/v						
Huskie	15	oz/A	5	b	0	100	100	80
NIS	0.5	%v/v						
Talinor	18.2	oz/A	5	b	0	95	100	69
CoACT+	3.6	oz/A						
NIS	0.5	%v/v						
Tolvera	14.7	oz/A	0	b	0	85	90	86
NIS	0.5	%v/v						