

Application of the WEED-IT precision sprayer for rush skeletonweed control in fallow

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Precision sprayers can be cost-effective tools in fallow management by applying herbicides only to weeds and not to bare ground. This can be especially important when applying high-cost herbicides or herbicides with long residual. Tordon® 22K (picloram) is an effective herbicide for control of rush skeletonweed (*Chondrilla juncea*) (Figure 1), however, there is concern that its long residual may cause yield loss. Tordon 22K is labeled for fallow applications at 16 oz/A, but in the past, it was used as a spot-spray treatment for field bindweed (a.k.a. morningglory) at rates that caused substantial yield reduction for several years following application. By using a precision applicator, the overall acreage sprayed should be less than by using a conventional broadcast sprayer; however, since rush skeletonweed is a spreading perennial, it is not clear if a precision spray application will be effective.

We initiated a trial in 2019 comparing applications of Tordon 22K using a WEED-IT precision sprayer with standard broadcast applications for rush skeletonweed control in no-till fallow. Tordon 22K was applied at 8, 16, and 32 oz/A using each application method on October 3, 2019 to rush skeletonweed in winter wheat stubble following the 2019 harvest at a field site near Hay, WA.



Figure 1. Rush skeletonweed in winter wheat one year after post-harvest Tordon 22K applications. Photo on the left is 8 oz/A; photo on right is 16 oz/A.

Soil type at the site is classified as a Walla Walla silt loam, 7-25% slope, and has a pH of 6.1 and 2.1% organic matter. The WEED-IT was calibrated to apply 29.4 gpa at 5 mph if all nozzles were spraying continuously. The broadcast applications were applied at 15 gpa at 3 mph. The plots measured 10 by 35 ft, but the WEED-IT applicator only sprayed a width of 6.7 ft. The field site was managed in no-till fallow through 2020 and fall-seeded to winter wheat. Treatment efficacy was evaluated with plant density counts on April 15, 2020 in the fallow, and on October 22, 2020 in the newly emerged winter wheat crop.

Rush skeletonweed density differed across the site, therefore, each WEED-IT application would cover an area in relation to the density in each plot. The percentage of area sprayed by the WEED-IT sprayer in relation to the total area covered, was 51, 26, and 28%, for the 8, 16, and 32

oz/A rates, respectively, which translates to 4.1, 4.2, and 9.1 oz/A of actual product for each respective rate. (Table 1).

Table 1. Area sprayed and amount of Tordon 22K applied with a WEED-IT precision sprayer compared with a standard broadcast application.

Tordon 22K applied using the broadcast rate	Percent of total area sprayed with the WEED-IT sprayer	Actual product applied using WEED-IT at each rate
oz/A	%	oz/A
8	52	4.1
16	27	4.3
32	29	9.2

By April 2020, all treatments had statistically fewer plants than the nontreated check that averaged 1.5 plants/yd², and no statistical differences were found between the WEED-IT and broadcast applications (Table 2). By October, density in the nontreated check had increased to 2.5 plants/yd² but was not statistically different from either the WEED-IT or broadcast application of Tordon 22K at 8 oz/A. In contrast, densities for the 16 and 32 oz/A treatments were not statistically different from each other but were less than the 8 oz/A rate and the nontreated check. No statistical difference was found between the WEED-IT and broadcast applications at any of the three rates (Table 2).

This study indicates that applications of Tordon 22K with a precision sprayer can be equally effective compared with broadcast applications for control of rush skeletonweed through the fallow phase of the wheat/fallow rotation. Furthermore, the labeled 16 oz/A rate appears to be as effective as a 32 oz/A rate; however, cutting the labeled rate in half does not control rush skeletonweed completely through the fallow year. These treatments will be evaluated in 2021 for effect on winter wheat yield.

Table 2. Effect of Tordon 22K applications in no-till fallow on rush skeletonweed density.

Application method	Rate oz/A	Rush skeletonweed density*	
		April 15, 2020	October 22, 2020
-----plants/yd ² -----			
Nontreated check	0	1.5 a	2.5 a
WEED-IT	8	0.2 b	1.9 a
Broadcast	8	0.1 b	3.2 a
WEED-IT	16	0.1 b	0.8 b
Broadcast	16	0.0 b	0.7 b
WEED-IT	32	0.1 b	0.4 b
Broadcast	32	0.0 b	0.2 b

*Means are based on four replicates per treatment. Means within each column followed by the same letter are not significantly different at the 95% probability level, which means that we are not confident that the difference is the result of treatment rather than experimental error or random variation associated with the experiment.

Disclaimer

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