

Rush skeletonweed control with Tordon 22K in no-till fallow is affected by application method, herbicide rate, and field conditions.

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Control of rush skeletonweed (*Chondrilla juncea*) in winter wheat/no-till fallow cropping systems was evaluated by comparing fall and spring applications of Tordon® 22K (picloram) using a WEED-IT™ precision sprayer and a broadcast application. Precision sprayers can be effective at spot spraying weeds in fallow, thus reducing chemical inputs compared to a complete coverage broadcast spray application. Furthermore, Tordon 22K is labeled for fallow applications at 16 oz/A and is an effective herbicide for controlling rush skeletonweed. However, Tordon 22K applied at high rates in fallow can result in subsequent crop injury.



Rush skeletonweed initiating flowering in no-till winter wheat stubble during July 2021.

A fall-applied trial was initiated in October 2020 near LaCrosse in winter wheat stubble. Spring-applied trials were initiated in May 2021, near LaCrosse and Hay, both in no-till fallow following 2020 winter wheat. Tordon 22K was applied at 8, 16, and 32 oz/A with the broadcast applicator and the WEED-IT applicator, if set to spray in the continuous mode. The broadcast

application spray volume was 15 gpa at 3 mph. The WEED-IT continuous application spray volume was 29.4 gpa at 5 mph ground speed; however, the total output per plot in spot-spray mode depended on the density of rush skeletonweed and the volume sprayed per plot was measured to determine the area sprayed per plot and the application rate of Tordon 22K. Soil type at the LaCrosse site was classified as a Bengé Complex and had a pH of 5.9 and organic matter content of 2.1% in the top 6 inches. Soil type at the Hay site was a Walla Walla silt loam and had a pH of 5.9 and organic matter content of 2.4% in the top six inches. All plots measured 10 by 35 ft, but the WEED-IT applicator only sprayed a width of 6.7 ft through the center of each plot. Rush skeletonweed plants were counted in a 6.7-ft strip through each plot at the time of application to establish a baseline density. Treatment efficacy was evaluated in July 2021 by re-counting rush skeletonweed plants in each plot prior to summer no-till fallow burn-down herbicide applications.

Dry fall conditions in 2020 and cold winter and early spring temperatures in 2021 reduced emergence of rush skeletonweed rosettes compared with previous years. The number of plants available for herbicide application by the WEED-IT applicator were few in both fall and spring applications, but especially in spring. Consequently, the broadcast applications outperformed the WEED-IT applications in the fall-applied trial, but all fall applications did reduce rush skeletonweed density compared with the nontreated check (Table 1). Rate was also a prevailing factor with the fall WEED-IT applications as the 16 and 32 oz/A rates resulted in the lowest densities. Emergence of rosettes in spring 2021 was delayed until late April and May due to cold, dry soil conditions. Furthermore, many rosettes quickly initiated bolting within a couple weeks of emergence. This is problematic for spring-applied herbicides because very little long-term control has been observed from applications once bolting begins in spring or early summer. Consequently, very few differences in application method were found with spring applications by the summer 2021 count. However, the 16 and 32 oz/A broadcast rates and the 32 oz/A WEED-IT rate resulted in fewer rush skeletonweed plants compared with the nontreated check by the summer 2021 count at LaCrosse (Table 1). At Hay, none of the treatments had lower plant densities than the nontreated check as bolting was further along at time of spring applications compared with LaCrosse.

The WEED-IT applications were consistently lower in amount of product applied compared with the broadcast applications (Table 2). The fall WEED-IT applications ranged between 21 and 27% of the full Tordon 22K broadcast rate per acre. The spring WEED-IT applications ranged between 5 and 19% of the full broadcast rates; however, the reduced coverage rates also reflect the low rush skeletonweed emergence at the time of application. None of the WEED-IT applications exceeded the labeled 16 oz/A rate. Since Tordon 22K has soil activity, more control may occur from the broadcast applications into the next crop phase. It is evident that the WEED-IT precision applicator may be better suited to years with a higher percentage of potential weed emergence prior to application as only emerged plants will be treated compared to complete area coverage with a broadcast applicator. These trials will be harvested for wheat yield in 2022. An identical trial initiated in the fall of 2019 was harvested for yield in 2021 and no differences were found between treatments.

Table 1. Effect of fall- and spring-applied Tordon 22K on rush skeletonweed density in no-till fallow comparing WEED-IT and broadcast applications.

Application method	Rate oz/A	Rush skeletonweed density measured in July 2021*		
		Fall applied LaCrosse 2020	Spring applied LaCrosse 2021	Spring applied Hay 2021
		-----plants/yd ² -----**		
Nontreated check	0	2.2 a	1.3 a	0.5 b
WEED-IT	8	0.9 b	0.9 ab	0.6 b
Broadcast	8	0.3 cd	0.9 ab	0.9 a
WEED-IT	16	0.3 c	0.9 ab	0.4 b
Broadcast	16	0.1 de	0.6 bc	0.5 b
WEED-IT	32	0.4 c	0.6 bc	0.5 b
Broadcast	32	0.0 e	0.3 c	0.3 b

*Applications were made in October 2020 at LaCrosse and May 2021 at LaCrosse.

**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.

Table 2. Amount of Tordon 22K applied with a WEED-IT precision sprayer compared with a standard broadcast application.

Amount of Tordon 22K applied		Percent of broadcast rate applied using the WEED-IT applicator
Broadcast	WEED-IT	
oz/A	oz/A	
<i>Fall 2020 applied - LaCrosse</i>		
8	2.1	26
16	3.4	21
32	8.7	27
<i>Spring 2021 applied - LaCrosse</i>		
8	0.9	11
16	1.9	12
32	1.6	5
<i>Spring 2021 applied - Hay</i>		
8	1.3	16
16	3.0	19
32	3.8	12

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