

## Rope wick and broadcast herbicide applications for control of smooth scouringrush in winter wheat fallow.

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We compared rope wick applications of RT 3® (glyphosate) with standard broadcast applications of RT 3 and Rhonox® (MCPA) for control of smooth scouringrush in no-till fallow (Figure 1). The advantage of a rope wick application is it places a higher concentration of RT 3 specifically on the target plant; however, broadcast applications have better overall coverage.



Figure 1. Smooth scouringrush in no-till fallow.

Applications of glyphosate have not been successful in the past for controlling

smooth scouringrush in fallow, but it is not known if the lack of control is because of herbicide concentration or timing of application. However, there is a need for control strategies that do not include long residual herbicides that could reduce yields in future crops.

Treatments were applied May 25, 2018 at a site near Omak, WA, and July 5, 2018 near Reardan, WA (Table 1). Both sites were in no-till fallow with a uniform density of smooth scouringrush stems. Plots measure 10 by 30 ft at Omak and 10 by 40 ft at Reardan. At both sites, plots were arranged in a randomized complete block design with four replications per treatment. Broadcast treatments were applied with a hand-held spray boom with six TeeJet® XR11002 nozzles on 20-inch spacing and pressurized with a CO<sub>2</sub> backpack at 3 mph. Spray output was 15 gpa at 25 psi. Rope wick treatments were applied with a 10-ft by 3-inch wick tube with braided polyester wicking ropes (Rodgers Sales Co. Inc., Lyon, MS) mounted on the front of a four wheeler ATV moving approximately 3 mph (Figure 2). The wick tube was supplied by a 3-gal CO<sub>2</sub> pressurized tank with just enough pressure to keep the ropes saturated and dripping.

Treatment were assessed 45 days after treatment (DAT) at Omak, and 33 DAT at Reardan. At the Omak site, stems were counted in two ¼ m<sup>2</sup> quadrat per plot on July 9, 2018. Stems were counted if green living tissue was visible. An accidental cattle grazing incident removed much of the biomass at this site, so biomass sampling would not have been meaningful. At the Reardan site, living portions of stems were collected in two ¼ m<sup>2</sup> quadrat/plot on August 7, 2018. Excessive branching on the lower portion of the stems made stem counts impractical.

Table 1. Application and soil data.

Location	Omak, WA	Reardan, WA
Application date	May 25, 2018	July 5, 2018
Growth stage, smooth scouringrush	stems with strobili	stems, 6 to 20 inches
Crop phase	no-till fallow	no-till fallow
Air temperature	85	79
Relative humidity (%)	23	36
Wind (mph, direction)	4-6, S	3-7, NNE
Cloud cover (%)	60	0
Soil temperature at 6 inches (F)	80	68

At the Omak site, the broadcast RT 3 was the most effective treatment (Table 2). The broadcast RT 3 reduced stem density by 91% compared with the non-treated check and was 3.6 times lower than the rope wick application. However, the rope wick application reduced stem density 68% compared to the non-treated check. At the time of application, some smooth scouringrush stems were lying on the ground, therefore the rope wick did not make contact with all stems.

The Rhonox treatment was not different than the non-treated check. This was partially due to a number of stems with incomplete herbicide control having both living and dead tissue but were counted as living stems; however, a number of stems had regrown since the herbicide application.



Figure 2. Rope wick application of RT 3 on smooth scouringrush.

At the Reardan site, a broadcast application of RT 3 + Silwet®, a nonionic organosilicone surfactant, was added to the trial. The RT 3 + Silwet treatment reduced living green biomass by 56% compared to the non-treated check, and was 54% lower in biomass than the RT 3 broadcast treatment without Silwet (Table 2). In contrast to the Omak site, there was no difference between the RT 3 broadcast without Silwet and the non-treated check. The rope wick application only reduced biomass 24% compared with the non-treated check and was not different than the RT 3 broadcast without Silwet. The Rhonox treatment was as effective as RT 3 + Silwet treatment and had reduced

smooth scouringrush biomass by 51% (Table 2). Better reported performance by Rhonox at Reardan was likely due to collecting only green living tissue during biomass sampling.

Results from these trials indicate that rope wick applications of RT 3 can reduce smooth scouringrush abundance in fallow, but getting good coverage of RT 3 on all stems may be a limiting factor. At Omak, some of the stems were lying flat on the ground and did not contact the wicking ropes. At Reardan, a thick, dense stand may have limited contact with the ropes, as well. However, rope wicking may be a useful tool in reducing smooth scouringrush abundance where applying a high broadcast rate of RT 3 is not desirable.

The May broadcast application of RT 3 at Omak was more effective compared to the same application in July at Reardan. This may suggest that RT 3 uptake by smooth scouringrush diminishes as the stems mature. Smooth scouringrush stems contain a high amount of silica, which may limit absorption if stems accumulate more silica as they age; however, the addition of Silwet adjuvant at Reardan increased the efficacy of RT 3. Silwet contains an organosilicone compound that may be better suited to increasing RT 3 uptake into the silica-rich stems than the surfactants packaged with RT 3. Maximum yearly application of RT 3 is labeled at 170 oz/A (5.3 qt/A); therefore, a follow-up broadcast treatment of RT 3 could be applied as long as the total amount did not exceed the labeled rate. Both trials will be re-evaluated in 2019 to assess potential long-term efficacy.

Table 2. Smooth scouringrush control comparing rope wick with broadcast herbicide treatments 45 days after treatment (DAT) at Omak, and 33 DAT at Reardan.

Treatment <sup>1</sup>	Rate	Smooth scouringrush abundance <sup>2</sup>	
		Omak Stem density (stems/m <sup>2</sup> )	Reardan Biomass (g/m <sup>2</sup> )
RT 3 – rope wick	75% v/v	61 b	57 b
RT 3 – broadcast	96 oz/A	17 c	72 ab
RT 3 + Silwet – broadcast	96 oz/A + 0.25%	--	33 c
Rhonox – broadcast	48 oz/A	170 a	38 c
Non-treated check	-	188 a	75 a

<sup>1</sup> Treatments applied May 25, 2018 at Omak and July 5, 2018 at Reardan.

<sup>2</sup> Values in each column followed by the same letter are not different ( $\alpha=0.05$ ). Omak treatments applied May 25, 2018; Reardan treatments applied July 5, 2018.