Smooth Scouringrush control with Finesse® in winter wheat/spring wheat/no-till fallow rotations

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Smooth scouringrush has become a problem in no-till wheat/fallow rotations in the intermediate to low rainfall areas of eastern Washington (Figure 1). We are evaluating control following applications of Finesse (chlorsulfuron + metsulfuron) or Rhonox® (MCPA LV ester) during the no-till fallow phase, and Amber® (triasulfuron) or Rhonox during the crop phase. We have demonstrated that chlorsulfuron, one of the active ingredients in Finesse, is effective for controlling smooth scouringrush for at least two years after application. However, the question remains: is a second application in a subsequent fallow phase needed for long-term control? Furthermore, this study evaluates the application of Amber during the crop phase. Amber is molecularly similar to chlorsulfuron and may be a bridge application between the two fallow Finesse applications. Rhonox is a control treatment for broadleaf weeds in both the fallow and crop phases when either Finesse or Amber are not applied. It initially burns down smooth scouringrush stems, turning them black but does not appear to reduce smooth scouringrush stem density in the year following application.

Figure 1. Smooth scouringrush stems between rows of winter wheat.

Two trials were initiated in 2019, one near Edwall, WA on the Camp farm and a second near Steptoe, WA on the Hall farm. Each site is in a no-till winter wheat/spring wheat/no-till fallow rotation. The Edwall site is in the bottom of a gentle-sloping northwest-facing draw with good moisture and well-drained soil, which is classified as a Broadax silt loam. Soil organic matter and pH measured 2.9% and 5.0, respectively. The Steptoe site is on a low-lying flat with inundated soil during winter and early spring. Soil at Steptoe is classified as Caldwell silt loam. Soil organic matter and pH measured 3.4% and 7.2, respectively. Both sites average around 16 inches of precipitation per year.

At each site, plots measure 10 by 30 ft and are arranged in a randomized complete block design with four replications per treatment. All herbicide treatments are applied with a hand-held spray

boom with six TeeJet® XR11002 nozzles on 20-inch spacing and pressurized with a CO_2 backpack at 3 mph. Spray output was 15 gpa at 25 psi. Treatment sequences and herbicide rates are presented in Table 1.

Table 1. Herbicide sequences for long-term study for control of smooth scouringrush in wheat/fallow cropping systems in eastern Washington.

	Edwall and Steptoe herbicide sequences*						
Trt	Fallow 2019	WW 2020	SW 2021	Fallow 2022	WW 2023	SW 2024	Fallow 2025
1	Finesse	Amber	Amber	Finesse	Amber	Amber	Final evaluations
2	Finesse	Amber	Rhonox	Finesse	Amber	Rhonox	
3	Finesse	Amber	Amber	Rhonox	Amber	Amber	
4	Finesse	Rhonox	Rhonox	Rhonox	Rhonox	Rhonox	
5	Finesse	Rhonox	Rhonox	Finesse	Rhonox	Rhonox	
6	Rhonox	Rhonox	Rhonox	Rhonox	Rhonox	Rhonox	

*Trt=treatment; WW=winter wheat; SW=spring wheat
Finesse (chlorsulfuron/metsulfuron) is applied at 0.5 oz/A.
Amber (triasulfuron) is applied at 0.56 oz/A.
Rhonox (MCPA) is applied at 34.6 oz/A in fallow and 24 oz/A in crop.
All treatments include NIS surfactant at 0.33% volume/volume concentration.

At each evaluation, stem density is measured in each plot and presented as number of stems/yd^2. Identical treatments at the time of evaluation are grouped together for each analysis. All applications in 2020 were applied in the winter wheat phase of each rotation. At both Edwall and Steptoe, Finesse applied in the previous fallow year resulted in densities less than 1 stem/yd^2, and at each site, which were statistically different than the Rhonox only sequence (Table 2). No statistical difference was seen between Finesse followed by Amber and Finesse followed by Rhonox. Stem density in the Rhonox only treatment at Steptoe was considerably lower than the initial density in 2019 (818 vs 25 stems/yd^2). This site was inundated with water through the winter which appeared to substantially reduce stem emergence in the 2020 winter wheat crop.

Harvest yields at Steptoe were not different between treatments and averaged 67 bu/A. At Edwall, the Rhonox only sequence yielded 82 bu/A and was statistically lower than either Finesse followed by Amber or Finesse followed by Rhonox, which yielded 96 and 97 bu/A, respectively. Greater smooth scouringrush stem density at Edwall likely reduced wheat yield in the Rhonox only sequence.

This research continues to show that Finesse results in good control of smooth scouringrush (Figure 2). The three-year rotation will stretch the time between Finesse applications, which may be a good test for long-term control. In the spring wheat phase, smooth scouringrush may be emerged by the time Amber is applied, thus providing a better opportunity to test the efficacy of this herbicide.

Table 2. Control of smooth scouringrush in winter wheat/spring wheat/no-till fallow rotations with Finesse – Edwall and Steptoe, WA.

Time	Sequence*	Smooth scouringrush density**
		----------stems per square yard----------
Fallow 2019 – Edwall		
	Initial	85
Fallow 2019 – Steptoe		
	Initial	818
WW Harvest 2020 - Edwall		
	Finesse/Amber	0.2 b
	Finesse/Rhonox	0.3 b
	Rhonox/Rhonox	185 a
WW Harvest 2020 - Steptoe		
	Finesse/Amber	0 b
	Finesse/Rhonox	0 b
	Rhonox/Rhonox	25 a

*See Table 1 for application rates.
** Means are based on four replicates per treatment. Means within a column for each location 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.

Figure 2. Smooth scouringrush in winter wheat near Steptoe, WA. The area highlighted in red was treated with Finesse the previous year while in no-till fallow.