Smooth Scouringrush control with Finesse® three years after application in winter wheat/ spring wheat/no-till fallow cropping systems.

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Smooth scouringrush is a problem in no-till wheat/fallow rotations in the intermediate to low rainfall areas of eastern Washington. In spring wheat, smooth scouringrush has the potential to be more competitive than in winter wheat as the stems can emerge near the same time as the wheat (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 continued long-term control? Furthermore, this study evaluates the application of Amber during the crop phases. 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 in fallow.

Two trials were initiated in 2019, one near Edwall on the Camp farm, and a second near Steptoe on the Hall farm. Each site is in a no-till winter wheat/spring wheat/ 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 a 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 nozzles on 20-inch spacing and pressurized with a CO_2 backpack. Spray output in 2019-2021 was 15 gpa at 25 psi through TeeJet® XR11002 nozzles at 3 mph. In 2022, spray output was 15 gpa at 40 psi through TeeJet AIXR10015 nozzles at 3 mph. Treatment sequences and herbicide rates are presented in Table 1.

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

Edwall and Steptoe herbicide sequences*							
Seq	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	

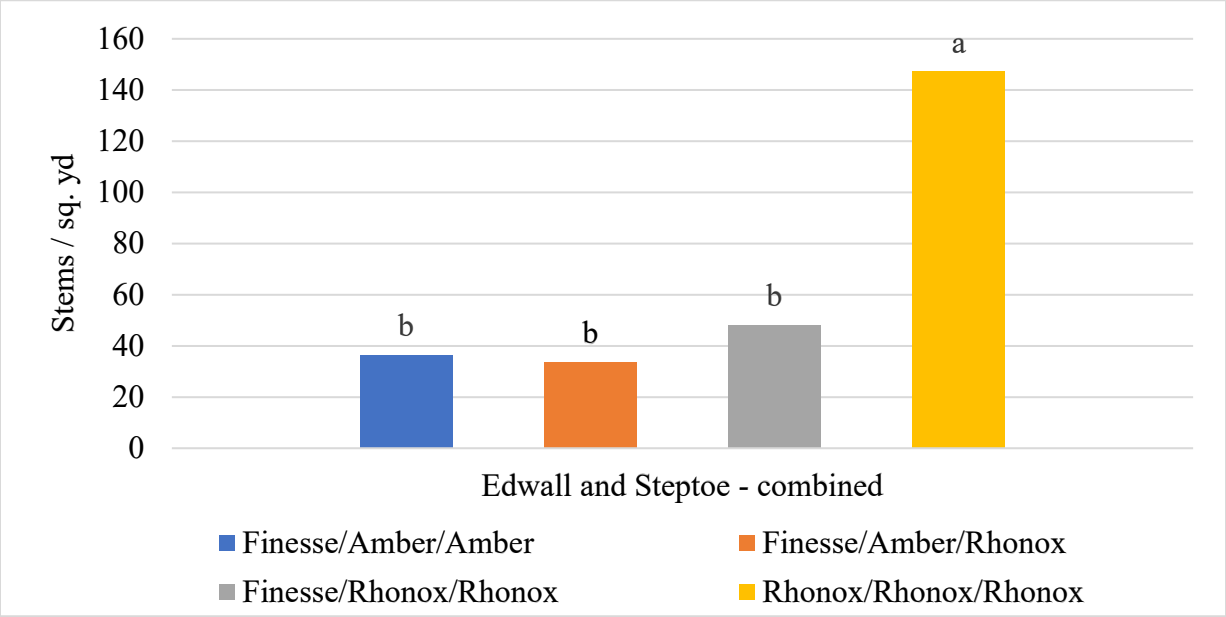
*Seq=sequence; WW=winter wheat; SW=spring wheat
Finesse (chlorsulfuron/metsulfuron) is applied at 0.5 oz/A.
Amber (triasulfuron) is applied at 0.56 oz/A.
Rhonox (MCPA) is applied at 34.6 oz/A in fallow and 24 oz/A in crop.
All treatments include NIS surfactant at 0.33% volume/volume concentration.

On June 30, 2022, all treatments were evaluated during the fallow phase of the three-year rotation at each site. This evaluation follows one complete rotation cycle that began in 2019 (Table 1). Smooth scouringrush stem densities were measured in two subplots in each plot at each location. The Edwall site had been managed without tillage each year. The Steptoe site was plowed following the 2020 winter wheat crop, and then lightly disked following the 2021 spring wheat crop. Treatment results were statistically similar at Edwall and Steptoe; therefore, results from the two study locations were combined. Treatment sequences where Finesse was applied in 2019 were all statistically similar (Figure 2). The treatment sequences where only Rhonox was applied each year had a statistically higher density than treatment sequences with Finesse. After one rotation cycle, Amber applied in the crop phases did not appear to increase smooth scouringrush control (Figure 2). In the 2022 census, densities at Edwall were greater than at Steptoe (data not shown) and this difference may have resulted from post-harvest tillage at the Steptoe location; however, this is only speculation because we did not have a no-till comparison at Steptoe.

Following the 2022 density counts, treatments were applied to all plots; however, only three of the six treatment sequences included Finesse (Table 1). This research continues to show that Finesse reduces smooth scouringrush density for several years following application. The second

rotation cycle will compare the performance of Finesse applied in the initial rotation cycle with and without Finesse applied in the second rotation cycle.

Figure 2. Smooth scouringrush stem density in 2022 fallow following one rotation of winter wheat/spring wheat/fallow cropping systems at Edwall and Steptoe, WA, combined. Each column represents the different herbicides applied in 2019, 2020, and 2021.*



*Means associated with each column are based on four replicates per treatment combined over two locations. Columns with the same letter are not significantly different at the 95% probability level, which may have resulted from similar treatment effects, but also from experimental or random error associated with the trial.