

## Smooth Scouringrush control in no-till winter wheat/fallow at Omak, WA.

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A multi-year study initiated in June 2017 will examine control of smooth scouringrush in no-till winter wheat/fallow near Omak, WA. The study compares applications of Finesse® (chlorsulfuron plus metsulfuron) or Rhonox® (MCPA) during the fallow phase and Amber® (triasulfuron) or Rhonox during the crop phase. From previous research we know that chlorsulfuron controls smooth scouringrush, but a single application will not maintain control over time. This study compares application of Finesse in one and two fallow years of the rotation. Amber is molecularly similar to chlorsulfuron and is included to determine its activity during the crop phase. 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 control smooth scouringrush over time.

The study site is near Omak, WA on land farmed in a no-till winter wheat/fallow rotation; however, winter canola sometimes replaces winter wheat. 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<sub>2</sub> backpack at 3 mph. Spray output is 15 gpa at 25 psi.

The first-year treatments were applied June 25, 2017 in the no-till fallow phase (Table 1). Glyphosate had been applied over the entire plot area earlier in the year to control volunteer crop and winter annual weeds. Smooth scouringrush emerged following the glyphosate application and was up to 24 inches high and averaged 242 stems/m<sup>2</sup> by June 25 (Table 2). Winter wheat was seeded in November and emerged late due to dry soil conditions. Spring herbicide treatments in the wheat crop were applied April 25, 2018 when the wheat was 6 to 9 inches high and had 1 tiller. This application coincided with the grower's herbicide application to the surrounding field. Smooth scouringrush had not yet emerged by this date.



Figure 1. Smooth scouringrush in winter wheat next to winter wheat treated with Finesse on left.

Table 1. Application and soil data.

Application date	June 25, 2017	April 25, 2018
Growth stage, smooth scouringrush	stems with strobili	not emerged
Growth stage, wheat	n/a	6 to 9 leaves, 1 tiller
Air temperature	85	76
Relative humidity (%)	23	24
Wind (mph, direction)	0-3, NW	2-4, N
Cloud cover (%)	70	0
Soil temperature at 6 inches (F)	86	65
Soil texture	sandy loam	
Soil pH (0-6 inches)	5.7 to 6.3	

Smooth scouringrush stems were initially counted in four  $\frac{1}{4}$  m<sup>2</sup> quadrats per plot on June 25, 2017. Four quadrats were counted per plot in the first census to better measure variability across the study site. In the following censuses, stem density was counted in two  $\frac{1}{4}$  m<sup>2</sup> quadrats placed several paces in from the end of each plot, which is consistent with previous work done with this species. Smooth scouringrush density was counted May 25, 2018 when the wheat crop was heading and again on August 13, 2018 just prior to crop harvest. All plots were harvested with a Wintersteiger plot combine. Grain samples were bagged, cleaned, weighed, and subsampled for grain moisture. Grain weight was converted to bu/A on a 12% moisture basis.

As of the August 2018 census, the 2017 application of Finesse had maintained near 100% control of smooth scouringrush. Due to near complete control with Finesse, it was not yet evident if Amber added to the overall control. Smooth scouringrush density was zero in all 2017 Finesse-treated plots at the May 25 census (Table 2). By the August 13 census, a few plants were counted in several of the Finesse-treated plots but these counts did not correlate with any specific treatment. The Rhonox-only treated plots averaged 254 stems/m<sup>2</sup> on August 13, which was similar to the initial density of 234 stems/m<sup>2</sup> in 2017. This is further evidence that Rhonox does not control smooth scouringrush over time. Wheat yield from the 2018 harvest was not different between any of the treatments (Table 2), which is interesting given the high density of smooth scouringrush in the Rhonox-only plots compared with the Finesse-treated plots.

In 2019, only three treatments will include Finesse, therefore, the 2020 censuses will assess the efficacy of the single Finesse treatment applied in 2017. Final assessments will be made in 2021.



Figure 2. Smooth scouringrush stem with spore-producing strobili.

Table 2. Scouringrush control in wheat/fallow with Finesse – Omak, WA

Herbicide application timing <sup>1</sup>				Scouringrush density <sup>2</sup>			Wheat Yield (bu/A)
Fallow 2017	Crop 2018	Fallow 2019	Crop 2020	Summer 6-25-17	Spring 5-25-18	Summer 8-13-18	
				------(stems/m <sup>2</sup> )-----			
Finesse	Amber	Finesse	Amber	259 a	0 b	0.2 b	27 a
Finesse	Amber	Finesse	Rhonox	201 a	0 b	0 b	28 a
Finesse	Amber	Rhonox	Rhonox	261 a	0 b	0 b	32 a
Finesse	Rhonox	Rhonox	Rhonox	227 a	0 b	0 b	26 a
Finesse	Rhonox	Finesse	Rhonox	271 a	0 b	0.1 b	28 a
Rhonox	Rhonox	Rhonox	Rhonox	234 a	111 a	254 a	32 a

<sup>1</sup> Finesse (chlorsulfuron/metsulfuron) applied at 0.5 oz/A with 0.33% NIS surfactant.

Amber (triasulfuron) applied at 0.56 oz/A with 0.33% NIS surfactant.

Rhonox (MCPA) applied at 34.6 oz/A in fallow and 24 oz/A in crop.

Fallow treatments in 2017 were applied June 28, 2017.

Crop treatments in 2018 were applied May 25, 2018.

<sup>2</sup> Values in each column followed by the same letter are not different ( $\alpha=0.05$ ).