Smooth scouringrush control with Glyphosate and Finesse® applied in fallow

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Smooth scouringrush (*Equisetum laevigatum*) control in wheat/fallow rotations in eastern Washington has been difficult because of limited effective herbicide options (Figure 1). In different studies, we have shown that applications of either Finesse (chlorsulfuron + metsulfuron) or RT® 3 (glyphosate) during the fallow year can control smooth scouringrush into the following crop year; however, RT 3 has only been effective when applied at a high rate and with Silwet® L77 organosilicone surfactant. In contrast, Finesse is effective for at least two years after application, but when applied alone, does not control other weeds that might be present in the fallow. This study examines the effect of Finesse and RT 3 applied alone or in combination at different rates of RT 3.

Figure 1. Smooth scouringrush in fallow near Dayton, WA.

The study sites are located on the Lambertt farm near Dayton, WA, and the Hall farm near Steptoe, WA. The fields were in the no-till fallow phase of wheat/fallow rotations. The Dayton site is on a 30-40% northwest facing slope with a Walla Walla silt loam well-drained soil. Soil pH measured 5.4 and organic matter measured 2.1%. The Steptoe site is on low-lying flat with a Covello silt loam that is sometimes inundated with water during winter or early spring. Soil pH measured 5.8 and organic matter measured 2.9%. Initial smooth scouringrush density averaged 326 and 279 stems/yd^2 at the Dayton and Steptoe sites, respectively.

At each site, plots measured 10 by 30 ft and were arranged in a randomized complete block design with four replications per treatment. Herbicide treatments were applied on July 6, 2019 at both locations 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. Visual ratings were made 14, 28, and 42 days after treatment (DAT) and assessed the effect of the herbicides in relation to plants in nontreated check plots. Injury symptoms included changes in stem color ranging from light green to yellow or light tan, and reduction in height compared to nontreated plants.

The response to the herbicide treatments differed dramatically at each site. Symptoms were much slower to develop at Dayton than at Steptoe. Control ratings 14 DAT at Dayton did not exceed 40% of the nontreated plots but reached 88% at Steptoe (Table 1). This may be partly related to soil conditions as soil temperatures in the top 2 inches at the time of application measured 67° F at Dayton and 90° F at Steptoe. This trend continued as injury symptoms never exceeded 70% at Dayton, even at 42 DAT, but at Steptoe the most effective treatments exceeded 90% by 28 DAT. By 42 DAT at Dayton the most effective treatments were the 64 or 96 oz/A rates of RT 3 + Finesse, or the 96 oz/A rate of RT 3 alone, which averaged 53 to 66% control (Table 1). In contrast, at Steptoe, control with the 96 oz/A rate of RT 3 alone averaged 84% but was statistically less effective than either the 64 or 96 oz/A rates of RT 3 + Finesse, which averaged 92 and 94% control, respectively. At Dayton, the 64 oz/A rate of RT 3 + Finesse was statistically better than the 64 oz/A RT 3 alone, but at Steptoe no statistical difference was found between these two treatments. However, at Steptoe, the 32 oz/A rate of RT 3 + Finesse was statistically more effective than the 32 oz/a rate alone. No statistical differences between the 32 oz/A rate of RT 3 alone and Finesse alone was found at either location.

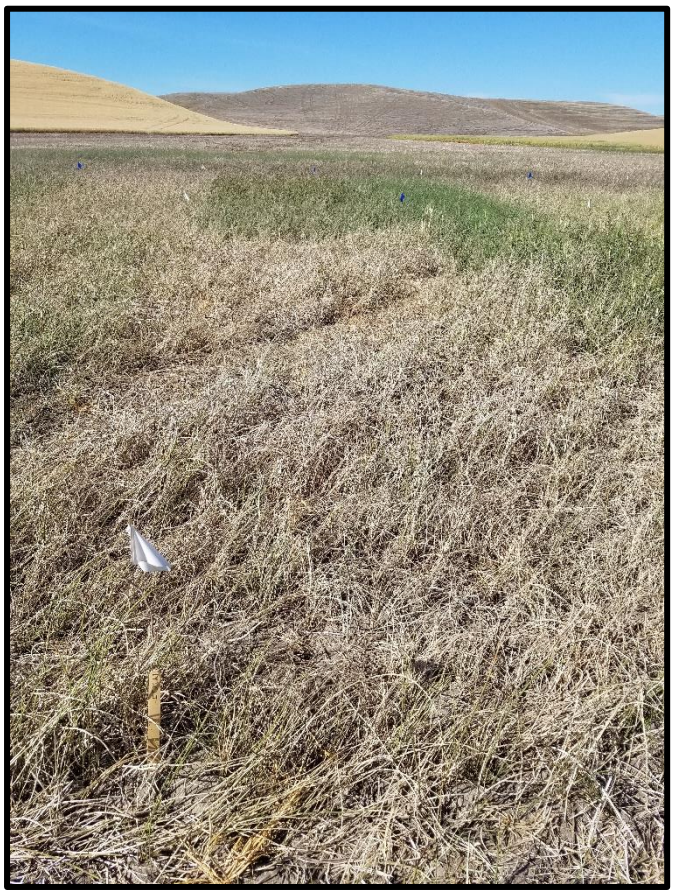

Figure 2. In the foreground, control of smooth scouringrush in fallow with 96 oz/A of RT 3 plus 0.5 oz/A Finesse at Steptoe, WA. Back right plot is a nontreated check.

Control of smooth scouringrush in fallow is greater with the higher rates of RT 3 and with the addition of Finesse (Figure 2). Furthermore, these treatments all contained Silwet L77, which is critical for the RT 3 to be effective. These treatments will be evaluated in the 2021 winter wheat crops. Finesse-treated plots are expected to contain very little smooth scouringrush, but it will be informative to see the effectiveness of the combinations of Finesse and RT 3 at different rates.

See next page for Table 1.

Table 1. Visual assessment of smooth scouringrush control following applications of RT 3 and Finesse in fallow.

Location/Treatments*	Rates	Visual control ratings		
		14 DAT	28 DAT	42 DAT
	oz/A	percent of nontreated check**		
Dayton, WA				
Nontreated check	none	0	0	0
RT 3	32	8 c	10 e	19 b
Finesse	0.5	11 c	21 d	25 b
RT 3 + Finesse	32 + 0.5	19 b	33 c	33 b
RT 3	64	11 c	25 d	27 b
RT 3 + Finesse	64 + 0.5	24 b	51 b	61 a
RT 3	96	19 b	40 c	53 a
RT 3 + Finesse	96 + 0.5	39 a	65 a	66 a
Steptoe, WA				
Nontreated check	none	0	0	0
RT 3	32	53 d	64 d	51 c
Finesse	0.5	10 e	52 e	53 c
RT 3 + Finesse	32 + 0.5	75 c	79 c	84 b
RT 3	64	83 ab	85 bc	83 b
RT 3 + Finesse	64 + 0.5	79 bc	91 ab	92 a
RT 3	96	85 a	87 abc	84 b
RT 3 + Finesse	96 + 0.5	88 a	92 a	94 a

*All herbicide treatments included Silwet L77 surfactant at 0.5% v/v.
**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.