

Smooth scouringrush control in winter wheat following applications of glyphosate with four surfactants in fallow.

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Control of smooth scouringrush (*Equisetum laevigatum*) in no-till fallow with glyphosate herbicides has been largely unsuccessful, especially at applications rates intended for annual weed control. We compared four different surfactants with RT[®] 3 glyphosate herbicide applied at 96 oz/A during the 2019 no-till fallow phase of a wheat/fallow rotation for control of smooth scouringrush into the following winter wheat crop. Surfactants were Silwet[®] L77, Spray Guard[®], Crop Oil-M[®], and Wetcit[®]. Silwet L77 is an organosilicone non-ionic surfactant. Spray Guard is a water conditioning and deposition aid that contains ammonium sulfate (2 lbs NH₄SO₄/gallon) and phosphoric acid. Crop Oil-M is a petroleum-based surfactant, and Wetcit is a citrus, alcohol-based surfactant. In related studies, we have found that Silwet L77 has increased efficacy of RT 3 at the 96 oz/A rate. This trial compares surfactant options to Silwet L77.



Figure 1. Nontreated smooth scouringrush in winter wheat.

The study site was located on the Hall farm near Steptoe, WA. The field is in a three-year rotation of no-till fallow/winter wheat/spring wheat. Soil pH and organic matter was 5.0 and 2.7%, respectively. Initial smooth scouringrush density averaged 370 stems/yd². Plots measured 10 by 30 ft and were arranged in a randomized complete block design with four replications per treatment. All herbicide treatments were applied on June 9, 2019 with a hand-held spray boom with six TeeJet[®] XR11002 nozzles on 20-inch spacing and pressurized with a CO₂ backpack at 3 mph. Spray output was 15 gpa at 25 psi. Stem density was measured in each plot in the 2020 winter wheat crop on July 17, 2020 just prior to harvest (Figure 1).

Smooth scouringrush in the 2020 winter wheat crop averaged 167 stems/yd² following the 2019 application of RT 3 + Spray Guard and was least effective compared with the other three surfactant treatments (Table 1). In a neighboring trial, RT 3 without any surfactant resulted in

143 stems/yd², suggesting that Spray Guard is not aiding RT 3 uptake in smooth scouringrush. The RT 3 + Crop Oil-M treatment averaged 61 stems/yd² and reduced density by 63% compared with RT 3 + Spray Guard. The RT 3 + Crop Oil-M treatment was not statistically different from RT 3 + Wetcit, which had a density of only 35 stems/yd². The RT 3 + Silwet L77 treatment had the lowest density of 21 stems/yd² but was not statistically different from RT 3 + Wetcit.

This trial supports our findings that Silwet L77 is a very effective surfactant when added to RT 3 for control of smooth scouringrush; however, Wetcit appears to be a reasonable alternative. It is again apparent that an effective surfactant is critical for smooth scouringrush control when applying RT 3 herbicide.

Table 1. Smooth scouringrush control with RT 3 herbicide and four different surfactants applied in the 2019 no-till fallow phase of a wheat/fallow rotation and measured during the 2020 winter wheat crop.

Herbicide + Surfactant	Rate oz/A + % v/v	Scouringrush density* stems/yd ²
RT 3 + Spray Guard	96 + 0.75	167 a
RT 3 + Crop oil	96 + 0.75	61 b
RT 3 + Wetcit	96 + 0.5	35 bc
RT 3 + Silwet	96 + 0.25	21 c

*Means are based on four replicates per treatment. Means within a column 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.