

Evaluation of preemergence herbicides for the control of Russian-thistle in chemical fallow

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A trial was established on chemical fallow ground on the Smith Farm near Lind, WA to evaluate timings of preemergence herbicides for the control of Russian-thistle. The objective of the study was to evaluate various herbicides applied preemergence to take some of the selection pressure off of glyphosate and paraquat, the two most common herbicides used to control Russian-thistle postemergence. Glyphosate-resistant Russian-thistle plants have been documented in Washington, Oregon and Montana.



The chemical fallow period followed spring wheat. It was such a dry fall that a burndown application across the trial area was not necessary at the time of the initial application on November 28, 2018. This will be referred to as the late fall application timing. Treatments were applied with a CO₂-powered backpack sprayer set to deliver 10 gpa at 48 psi at 2.3 mph. The air temperature was 50°F, relative humidity was 61% and the wind was out of the south at 6 mph. The second application occurred on March 28, 2019, which will be referred to as the late winter application timing. Treatments were applied with a CO₂-powered backpack sprayer set to deliver 10 gpa at 56 psi at 2.3 mph. The air temperature was 50°F, relative humidity was 68% and the wind was out of the northeast at 5 mph. In addition, on March 28th, RT-3 + AMS (32 fl oz/A + 17 lb per 100 gallon) was applied over the trial area to control primarily volunteer spring wheat. After May 15th rating date, the trial area was sprayed with RT-3 plus Spray Prep (32 fl oz/A + 2 qts/100 gal) to control the Russian-thistle and tumble mustard. After the June 13th rating date, Russian-thistle plants were hand rouged. After the July 9th rating date, RT-3, 2,4-D LV6, Spray Prep and M-90 (64 fl oz/A + 8.0 fl oz/A + 2.0 qt per 100 gallons + 0.25% v/v) were applied to the entire trial area to control Russian-thistle. Soil at this site is a silt loam with 2.1% organic matter and a pH of 5.9.

Russian-thistle was the only broadleaf weed that was uniformly dispersed throughout the trial area for the duration of the trial. We were able to take one rating (May 15th) on the activity of these treatments for control of tumble mustard. Spartan Charge applied in the late fall provided significantly better control of tumble mustard when compared to the nontreated check (Table 2). However, Spartan Charge applied at either late winter or the split application, provided significantly better control of tumble mustard, which was comparable to the remaining treatments evaluated. On the initial May 15th rating date, all treatments were providing excellent control of Russian-thistle, except TriCor applied in the late fall. Over the next month, Spartan Charge, Fierce applied as a split application and TriCor applied in late winter continued to provide excellent control of Russian-thistle. On the final rating of July 9th, only the Spartan Charge treatments, regardless of application time, were providing significantly better control than the nontreated check plots. The results of this trial suggest that preemergence herbicides can provide an alternative means of controlling Russian-thistle in chemical fallow and may become necessary as glyphosate-resistant Russian-thistle becomes more prevalent.

Treatment	Rate (oz/A)	Application Timing	Tumble mustard	Russian-thistle plants per square yard		
			plants per square yard	5/15/19	6/13/19	7/9/19
Nontreated Check			12.33 c ¹	14.64 c	0.20 b	0.39 cd
Spartan Charge	8 fl oz	Late Fall	2.78 b	0.00 a	0.00 a	0.01 a
Spartan Charge	8 fl oz	Late Winter	0.11 a	0.00 a	0.00 a	0.03 ab
Spartan Charge	4 fl oz fb 4 fl oz	Late Fall fb Late Winter	0.11 a	0.00 a	0.00 a	0.00 a
Fierce	4.5	Late Fall	0.00 a	0.22 a	0.16 b	0.52 cd
Fierce	4.5	Late Winter	0.00 a	0.35 a	0.16 b	0.28 bc
Fierce	2.25 fb 2.25	Late Fall fb Late Winter	0.00 a	0.00 a	0.08 ab	0.30 c
TriCor	10.5	Late Fall	0.00 a	4.93 b	0.17 b	0.67 d
TriCor	10.5	Late Winter	0.00 a	0.22 a	0.12 ab	0.34 cd
TriCor	5.25 fb 5.25	Late Fall fb Late Winter	0.10 a	0.35 a	0.15 b	0.38 cd

¹ Means, based on four replicates, within a column, followed by the same letter are not significantly different at P = 0.05 as determined by Fisher's protected LSD test, 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.