

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 Hennings Farm near Ralston, 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 reduce selection pressure for resistance to 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 late planted winter wheat. The trial area was sprayed with RT 3[®] (glyphosate) and Spray Prep[™] (48 fl oz/A + 2 qts/100 gal) at the time of the initial application on November 21, 2019. This was to control volunteer wheat, downy brome and tumble mustard. The November application 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 53 psi at 2.3 mph. The air temperature was 41°F, relative humidity was 61% and the wind was out of the southwest at 4 mph. The second application occurred on February 21, 2020, 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 53 psi at 2.3 mph. The air temperature was 47°F, relative humidity was 33% and the wind was out of the south at 5 mph. The trial area was void of vegetation at the late winter application timing, so RT 3 was not applied. After the May 14th and June 9th rating dates, the trial area was sprayed with RT 3 plus Spray Prep (48 fl oz/A + 2 qts/100 gal) and RT 3 (32 fl oz/A), respectively to control Russian-thistle. After the July 15th rating date, Russian-thistle plants were hand-rouged since the population was low. Soil at this site is a silt loam with 1.9% organic matter and a pH of 5.6.

Russian-thistle was the only broadleaf weed that was uniformly dispersed throughout the trial area for the duration of the trial; however, few seedlings emerged between the June and July sample dates. On the initial May 14th rating date, all treatments were providing excellent control of Russian-thistle, except TriCor[®] DF applied in the late fall. Over the remainder of the trial period, all treatments continued to provide excellent control of Russian-thistle except TriCor DF applied in late fall or late winter. 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	Russian-thistle plants per square yard		
			5/14	6/9	7/15
Nontreated Check			2.74 a ¹	1.39 a	0.03 bc
Spartan [®] Charge	8 fl oz	Late fall	0.01 c	0.00 b	0.00 c
Spartan Charge	8 fl oz	Late winter	0.02 c	0.00 b	0.00 c
Spartan Charge	4 fl oz fb 4 fl oz	Late fall fb Late winter	0.00 c	0.00 b	0.00 c
Fierce [®]	4.5	Late fall	0.02 c	0.00 b	0.02 bc
Fierce	4.5	Late winter	0.16 c	0.02 b	0.01 bc
Fierce	2.25 fb 2.25	Late fall fb Late winter	0.05 c	0.00 b	0.00 c
TriCor [®] DF	10.5	Late fall	1.15 b	1.52 a	0.08 a
TriCor DF	10.5	Late winter	0.00 c	0.05 b	0.04 b
TriCor DF	5.25 fb 5.25	Late fall fb Late winter	0.05 c	0.30 b	0.02 bc
Authority [®] MTZ DF	10	Late fall	0.06 c	0.01 b	0.00 c
Authority MTZ DF	10	Late winter	0.02 c	0.00 b	0.01 bc
Authority MTZ DF	5.0 fb 5.0	Late fall fb Late winter	0.05 c	0.01 b	0.00 c

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.