

Effects of Time of Day of Glyphosate Applications on Weed Control

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Objective

Previous Ohio State University small plot research has shown an effect of time of day for effectiveness of herbicide applications. These studies also used lower than normal rates on larger than normal weeds to assure a time of day effect. This study investigated the effect of the time of day of glyphosate using recommended rates on recommended sizes of target weeds.

Background

Cooperator:	Tom Weiler	Soil Test:	pH 7.0, P 23 ppm, K 154 ppm
County:	Morrow	Fertilizer:	None
Nearest town:	Chesterville	Herbicides:	Roundup UltraMax 26oz/A
Drainage:	Systematically tiled	Planting Date:	May 22, 2002
Soil type:	Sloan silty clay loam	Planting Rate:	203,000 seeds/acre
Tillage:	Conventional	Row Width:	10 inches
Previous Crop:	Corn	Harvest Date:	October 11, 2002
Variety:	Golden Harvest H-3243		

Methods

The field chosen had high giant ragweed and moderate to high common lambsquarters pressure. Annual grass and smooth pigweed pressure was light and variable. The study used six time treatments — Roundup UltraMax applied at 26 fluid ounces per acre at 6 a.m., 9 a.m., 12 p.m., 6 p.m., and 9 p.m. and an untreated check. Ammonium sulfate was added at 17.0 pounds/ 100 gallon of spray mixture. Experimental design was a randomized complete block with four replications and a plot size of 10 feet wide by 40 feet in length. Applications were made on June 19th when the giant ragweed was six to 10 inches tall. Weed control was visually evaluated on August 22 on a scale of 0 to 100 percent, with zero indicating no control and 100 percent indicating complete weed control. The center 6.6 feet of each plot was harvested with a plot combine.

Results

Table 1. Effect of Application by Time of Day on Giant Ragweed and Common Lambsquarters Control and Soybean Yield.^a

Time of Application	Weed Control ^{bc}		Soybean Yield ^c (bu/A)
	Giant Ragweed (%)	Common Lambsquarters (%)	
6:00 a.m.	78 b	98.0 b	63.5 bc
9:00 a.m.	100 a	98.5 ab	70.9 a
12:00 p.m.	100 a	100.0 a	68.6 ab
6:00 p.m.	98 a	99.3 ab	66.7 abc
9:00 p.m.	79 b	99.3 ab	61.0 c
LSD (0.05)	9.8	1.7	6.1
F test	13.3	2.2	2.7

^a Roundup UltraMax was applied at 26.0 ounces/ A plus AMS at 17.0 lb/ 100 gallon of spray mixture on June 19 at a spray volume of 20 gallons/ A at 30 PSI.

^b Plots visually evaluated on August 22, 2002.

^c Treatment means followed by the same letter are not significantly different.

Summary

There was a significant effect of time of day of application of glyphosate with the control of giant ragweed. Giant ragweed control was significantly lower when the glyphosate was applied at 6 a.m. and 9 p.m. In fields with high giant ragweed pressure, glyphosate should be applied somewhere between 9 a.m. and 6 p.m. to maintain maximum control.

The only significant difference in timing for common lambsquarters control was between the 6 a.m. and 12 noon applications. However, lambsquarters control was excellent no matter when glyphosate was applied.

The reduced weed control significantly lowered soybean yield when glyphosate was applied at 6 a.m. and 9 p.m. compared to being applied at 9 a.m. There appeared to be a time-of-day effect for smooth pigweed and not for annual grasses, but due to the variable and light pressure of these two species, evaluations could not be made.

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