

STACHLER, JEFF M.* and JOHN L. LUECKE, Department of Plant Sciences, North Dakota State University and University of Minnesota, NDSU - Dept. 7670, P. O. Box 6050, Fargo, ND 58108-6050. **Effect of late-season glyphosate on glyphosate-resistant common ragweed.**

ABSTRACT

Glyphosate-resistant common ragweed has been confirmed in eastern North Dakota and northwestern, Minnesota. If sugarbeet growers become aware of resistant common ragweed after Stinger can no longer be applied, what options do growers have? Glyphosate can be applied to glyphosate-resistant sugarbeet up to 30 days prior to harvest. In previous research, plant mortality increased and fecundity decreased when glyphosate was applied in early August during flowering of glyphosate-resistant common ragweed. The objective of this research was to determine the effect of glyphosate applied to glyphosate-resistant common ragweed at three stages of reproduction on visual control, plant mortality, and fecundity.

A small-plot non-crop research study having four replications was established near Buxton, ND on May 7, 2009. Twenty-five common ragweed plants were flagged prior to the initial application. Glyphosate (1.26 kg ae/ha) plus ammonium sulfate (2.2 kg ai/ha) was applied on June 15th to ≤ 4.5 cm common ragweed. Glyphosate (0.84 kg/ha) plus ammonium sulfate (2.2 kg/ha) was applied on July 6th. The entire plot width of 3.4 m was sprayed on June 15th and July 6th with a spray volume of 159 L/ha to select surviving plants for the reproductive stage treatments. Glyphosate (0.84 kg/ha) plus ammonium sulfate (2.2 kg/ha) was applied to common ragweed when the terminal male inflorescence spike began to elongate in approximately 40% of plants (July 31st), 10 days later, and 20 days later. The glyphosate formulation used in this study was the potassium salt in Roundup WeatherMAX. Plant mortality of the flagged plants was recorded 21 days after the first two applications, prior to the reproductive stage treatments, and October 7th. Visual weed control was recorded on October 7th. Each surviving flagged plant was harvested on October 7th and kept separate. Each plant was threshed and seeds cleaned. If enough seed was available, three equal volumes of seed were taken from a sample, weighed, chaff removed, and only the seeds weighed and enumerated. If three subsamples were not available all seeds were separated from the chaff and enumerated. The average seed production per plant was log transformed and reconverted. Data were subjected to analysis of variance and treatment means separated by Fisher's Protected LSD at 0.05.

Plant mortality ranged from 28 to 35% on July 6th for all treatments and increased to 41 to 51% at the time of the reproductive treatments. Plant mortality was greatest (60%) when glyphosate was applied 10 days after the initial reproductive application. On October 7th, visual control was greatest (34 and 33%, respectively) for the treatments applied 10 and 20 days after the initial reproductive application. Glyphosate applied 10 and 20 days after the initial reproductive application reduced common ragweed seed production 72 and 68%, respectively. Glyphosate applied to weeds surviving previous glyphosate applications and beginning to shed pollen can increase plant mortality and reduce weed seed production. If sugarbeet growers

become aware of weeds surviving previous glyphosate applications when weeds are too large to be controlled by other sugarbeet herbicides or the harvest interval no longer allows alternative herbicides to be applied, a late-season glyphosate application should help to reduce weed seed rain and future weed infestations.