

## **WEED MANAGEMENT WITH POSTEMERGENCE ETHOFUMESATE IN GLYPHOSATE-RESISTANT SUGARBEET**

Jeff M. Stachler\* and Aaron L. Carlson  
North Dakota State University and University of Minnesota, NDSU Dept. 7670,  
P. O. Box 6050, Fargo, ND 58108-6050

### **ABSTRACT**

Common lambsquarters and kochia are becoming more difficult to control with glyphosate in glyphosate-resistant sugarbeet in Minnesota and North Dakota. No postemergence conventional sugarbeet herbicide can completely and consistently control these species and provide any residual control. Ethofumesate may be able to provide additional control of common lambsquarters and kochia when mixed at higher than normal rates with glyphosate and provide some residual control. The objectives of a small-plot research trial conducted near Crookston, Minnesota in 2012 were to determine the effectiveness of ethofumesate applied postemergence at various rates and times with glyphosate to control common lambsquarters and kochia and determine the impact upon visual sugarbeet injury, root yield, and extractable sucrose. Plot width and length was 3.4 (2 m sprayed) and 9.1 m, respectively, all treatments were applied with a bicycle sprayer calibrated to deliver 17 gallons/A spray volume fitted with 8002 XR nozzles, sugarbeet row spacing was 55.9 cm, replications numbered four, and the glyphosate formulation used was a potassium salt (Roundup PowerMAX). Ethofumesate was applied at 0.56, 0.84, 1.12, 1.39, or 1.68 kg ai/ha/application plus glyphosate at 0.28 (to simulate glyphosate resistance) or 0.84 kg ae/ha plus Destiny HC (high surfactant oil concentrate) at 1.7 L/ha plus Ammonium sulfate at 3.8 kg in 378 L of spray volume. The ethofumesate plus glyphosate combination was applied two (only 1.12 and 1.68 kg/ha rates), three (four lowest rates), or four times (only 0.56 kg/ha rate). The initial application was applied to two-leaf sugarbeet and then sequentially every 14 days as necessary.

Glyphosate applied alone twice at 0.28 kg/ha controlled 51 and 86% common lambsquarters and kochia, respectively compared to glyphosate applied alone twice at 0.84 kg/ha controlling 82 and 98% of common lambsquarters and kochia, respectively just prior to harvest. The addition of ethofumesate at 1.12 and 1.68 kg/ha to glyphosate at 0.28 kg/ha applied twice controlled 76 and 78% and 89 and 86% of common lambsquarters and kochia, respectively. The addition of ethofumesate at 0.56, 0.84, 1.12, and 1.39 kg/ha to glyphosate at 0.28 kg/ha applied three times controlled 91, 93, 95, 99% of common lambsquarters, respectively and 99, 98, 96, and 99% of kochia, respectively. Increasing the rate of ethofumesate and the number of times it was applied with glyphosate improved common lambsquarters and kochia control. Increasing the rate of glyphosate and the number of glyphosate applications improved common lambsquarters and kochia control.

Sugarbeet injury was greatest for all treatments on June 14, 8 days after the second postemergence application and especially from treatments containing the highest rate (1.39 and

1.68 kg/ha) of ethofumesate (21% injury). Injury declined over time resulting in less than 9% injury on September 7<sup>th</sup>. Despite the early season sugarbeet injury, there was no significant root yield or extractable sucrose differences among treatments.