SITE PROPERTY VARIATION INFLUENCES VELVETLEAF RESPONSE TO SOIL-APPLIED HERBICIDE. Jeffrey W. Vogel, J. Anita Dille, Misti E. Tatro, and Gerard J. Kluitenberg, Undergraduate Research Assistant, Assistant Professor, Undergraduate Research Assistant, Professor, Department of Agronomy, Kansas State University, Manhattan, KS 66506.

Velvetleaf can be a severe problem in Kansas cornfields causing 40-80% yield loss. Flumetsulam, a soil-applied ALS inhibitor, is used to control broadleaf weeds in corn. The objective of this study was to monitor early spring season emergence and growth of velvetleaf in response to two rates of flumetsulam across a landscape that varies in soil texture, soil organic matter, pH, and soil water content.

A field study was conducted in 2001 at Manhattan, KS. Four 200-m transects, in parallel with a related study (Tatro et al., this proceedings), were established in a no-till cornfield of varying soil properties on April 20. Fourteen 5-m plots were placed 10 m apart along the length of each transect. On April 27, approximately 500 velvetleaf seed were sown within 15 cm of the corn row and 2.5-cm deep in each of the 5-m plots. Two transects received a preemergence application of 76 g/ha flumetsulam, the recommended rate, while the other two received 19 g/ha, 0.25 the recommended rate. The herbicide was applied using a backpack sprayer with 8002 spraying tips and 187 L/ha. Cumulative emergence counts were taken at 5, 7, 11, 14, and 18 days after planting (DAP). At 7 and 14 DAP, velvetleaf were marked to be harvested and weighed at 18 DAP. Untreated velvetleaf were also marked and harvested, under the same guidelines, from the neighboring transects that were within 4 m of the herbicide treated transects. Soil pH, organic matter, soil moisture content, and texture were also obtained from the neighboring transects.

Variable patterns in emergence were observed across the transects at 5, 7, and 11 DAP. At 14 DAP, a higher level of emergence occurred across all transects and an average of 30% velvetleaf had emerged. During 6-9 DAP, 71 mm of rain fell causing the flush of velvetleaf. Flumetsulam began to affect cumulative emergence at 18 DAP; the number of emerged and surviving velvetleaf dropped to an average 25%. There were no differences in emergence patterns between the recommended and the 0.25 rate because flumetsulam did not prevent velvetleaf germination and emergence. In 67% of the plots, an increasing rate of flumetsulam decreased the average per-plant dry weight. Across the four transects the difference in dry weight reduction in response to flumetsulam rate was not consistent. In some locations in the field, the recommended and 0.25 rate produced equivalent per-plant velvetleaf dry weights. This indicates the ability to adjust rates and still obtain adequate control for this field site. Soil pH varied from 6.6 to 7.8, organic matter varied from 1.8 to 2.6%, and clay content varied from 16 to 34% across the transects. No single soil property interacting with flumetsulam described the velvetleaf response. Additional data analysis will improve our understanding of how multiple soil properties interacted with flumetsulam and how the response varied in space.