INFLUENCE OF ORGANIC MATTER AND PH WITH FLUMETSULAM ON VELVETLEAF RESPONSE. Jeffrey W. Vogel and J. Anita Dille, Undergraduate Research Assistant and Assistant Professor, Department of Agronomy, Kansas State University, Manhattan, 66506.

Flumetsulam is a soil applied, ALS inhibitor herbicide that is labeled for use in corn and soybeans to selectively control broadleaf weeds. At lower pH, the more prevalent molecular form of flumetsulam is sorbed and less available (Fontaine et al. 1991). It is expected that at low pH and high organic matter less flumetsulam will be available for plant uptake and growth reduction. The objective of this study was to evaluate velvetleaf response to variable rates of flumetsulam across different soil properties under greenhouse conditions.

Velvetleaf growth was used to indicate flumetsulam plant availability across soil properties. Seven soils were taken from the Agronomy North Farm in Manhattan, KS that varied in texture, organic matter (OM), pH, and cation exchange capacity (CEC), which had been characterized in an earlier study (Tatro et al. 2001). Approximately 450 grams of each soil was placed in ten-centimeter diameter pots. Five rates of flumetsulam were applied preemergence to the pots (untreated, 0.25x, 0.5x, 1x, and 2x; x=76 g ha^{-1}) and then five velvetleaf seedlings per pot were established within five to seven days after planting (DAP). It was a completely randomized design with five replications and was repeated. Experiment one was initiated in April 2002 and experiment two was initiated in September 2002. Height measurements were taken at 11 and 21 DAP and aboveground dry matter and number of surviving seedlings at 21 DAP. Plant response was calculated as percent reduction in average dry matter relative to untreated.

In general velvetleaf mortality for both experiments increased with increased flumetsulam rate and varied by soils, although mortality was at a higher level in September. Percent reduction in average dry matter per pot relative to untreated encompasses both seedling mortality and dry matter reduction of surviving velvetleaf. Percent reduction in average dry matter per pot increased with flumetsulam rate and was greater in September for low rates (0.25x and 0.5x) and similar across experiments at high rates, approximately 80% and 83% for 1x and 2x rates, respectively. Percent reduction in average per surviving plant dry matter relative to untreated excludes mortality, which increased with flumetsulam rate. Maximum reduction in average per surviving plant dry matter was lower compared to reduction in total pot dry matter. Soil properties explain more of the response in dry matter reduction in May than in September. Velvetleaf response to flumetsulam was not explained by pH or OM in May or September and responses were opposite to expectations with CEC and clay content in May. Range of pH and OM may not have been broad enough. For example, flumetsulam applied to a soil with a pH of 5.8 and 4.6% OM caused injury to rotational sunflowers the year following application of 70 g ha^{-1} (Lehmann et al. 1992).