EFFICACY OF FLUMIOXAZIN AS AFFECTED BY SOIL ORGANIC MATTER, CLAY CONTENT AND SOIL pH. Calvin F. Glaspie*, Wesley J. Everman, John Pawlak and Andrew J. Chomas, Graduate Student, Assistant Professor, Research Assistant, Michigan State University, Department of Crop and Soil Sciences, 478 Plant and Soil Science, East Lansing, MI 48824, Product Development Manager, Valent U.S.A., P.O. Box 8025, Walnut Creek, CA 94596.

Flumioxazin is a protoporphyrinogen oxidase inhibiting broadleaf herbicide used for control of weeds in several cropping systems including cotton, peanut, soybean, sugarcane and sweet potato. In most cropping systems flumioxazin is applied preemergence for early season weed control. Previous studies have been conducted on the persistence of this compound to understand its environmental fate in the soil. These studies however, have not focused on the impact soil constituents have on flumioxazin's residual weed control. To understand the effect soil amendments and pH have on residual weed control of flumioxazin, a replicated greenhouse experiment was conducted in 2008 and 2009 at Michigan State University. The statistical design was a factorial arrangement of treatments with soil amendment percentage factored by herbicide treatment being non-treated or treated with 71 g ai/ha of flumioxazin. Clay soils used in the study were 0, 10, 20, 30, 40, 50, 60 and 70% clay by mass created by adding kaolin clay to sand. Organic soils used in the study were 0, 0.5, 1, 2, 4, 8, 16, and 32% organic matter by mass created by adding muck soil (88% organic material) to sand. Soils with varying pHs were created by acidifying (H_3PO_4) or neutralizing (NaOH) a control soil (pH of 4.56) to a pH of 4, 5, 6, 7, 8 and 9. Seeds of velvetleaf (Abutilon theophrasti), barnyardgrass (Echinochloa crus-galli), and redroot pigweed (Amaranthus retroflexus) were incorporated into the top 1.27 cm of each soil at a density of 100 seeds per pot. Emerged plants were counted and removed in both treated and not-treated pots 2 weeks after planting, and each following week for 6 weeks. Efficacy of flumioxazin was evaluated by calculating percent emergence of weeds in treated soils compared to emergence of weeds in non-treated soils. Emergence of weeds varied by soil alteration and followed general trends as soil parameters increased. Weed emergence was greatest 2 weeks after planting and decreased each week after. Efficacy of flumioxazin was not affected by clay content or soil pH, but decreased as organic matter content increased. Further work is still needed to evaluate each soil factor's role in flumioxazins control of weeds.
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