

EFFICACY AND DEGRADATION OF MESOTRIONE AND ISOXAFLUTOLE IN THE SOIL. Nicholas T. Fassler and F. W. Simmons, Graduate Research Assistant and Associate Professor, Department of Crop Science and Department of Natural Resources and Environmental Sciences, University of Illinois, Urbana, IL 61801.

Soil dissipation rates determine temporal efficacy relations for herbicides with soil activity. Little is known about the relative dissipation rates of two recently introduced herbicides; mesotrione and isoxaflutole. Our study had two objectives: 1) To determine if there is a significant difference in the length of control between preemergence (PRE) applications of isoxaflutole and mesotrione and 2) To explore the possibility of a soil pH interaction with herbicide degradation rates. Greenhouse bioassay experiments were conducted on field-sampled soils treated with isoxaflutole and mesotrione in 2002 and 2003 at three Illinois locations. Soil types at the three locations were Flanagan silt loam with 3.6% O.M., Drummer silt loam with 4.5% O.M., and Cisne silt loam with 2.1% O.M. These studies were conducted on established pH plots where the pH was adjusted to incremental levels ranging from  $< 6.0$  to  $> 7.5$ . Mesotrione was applied PRE at  $211 \text{ g ha}^{-1}$ ,  $158 \text{ g ha}^{-1}$ , and  $105 \text{ g ha}^{-1}$  while isoxaflutole rates were  $105 \text{ g ha}^{-1}$ ,  $78 \text{ g ha}^{-1}$ , and  $52 \text{ g ha}^{-1}$ . Soil samples were taken from the middle of each plot 5 to 10 days after application and at every 14 days up to 40 days after application. Soil samples were returned to the greenhouse and planted with velvetleaf and common waterhemp as bioassay species. Soil samples were mixed and re-planted after successive 15-day grow out periods until no visible control was observed. Herbicide efficacy based on bioassay results was similar for both herbicides in most locations and years. Soil-dissipation rates based on decrease of velvetleaf control from 100 to 80% ranged from 11 to 52 days. Growing degree-day indices better described dissipation rates than did a simple days after application variable.