

MODE OF ANTAGOISM OF SULFONYLUREA HERBICIDES WITH MESOTRIONE. Christopher L. Schuster, Kassim Al-Khatib, and J. Anita Dille, Graduate Student, Professor, Associate Professor, Department of Agronomy, Kansas State University, Manhattan, KS 66502.

Studies were conducted to determine if absorption, translocation, or metabolism was the basis for the reduction in sulfonylurea herbicide efficacy on foxtail species when mesotrione was tank mixed with sulfonylurea herbicides. Green foxtail and yellow foxtail plants were grown in the greenhouse and treated at the 4-leaf stage with <sup>14</sup>C-labeled nicosulfuron or rimsulfuron applied alone or with mesotrione or mesotrione + atrazine. Absorption of nicosulfuron was greater in green foxtail and yellow foxtail 7 days after treatment (DAT) when applied alone, as compared to tank mixing the herbicide with mesotrione or mesotrione + atrazine. Nicosulfuron applied alone translocated 9% more nicosulfuron to the treated tiller in green foxtail, as compared to nicosulfuron tank mixed with mesotrione or mesotrione + atrazine 7 DAT. Translocation of nicosulfuron in yellow foxtail, however, was similar when nicosulfuron was applied alone in combination with mesotrione or mesotrione + atrazine. Tank mixing mesotrione with rimsulfuron did not reduce the absorption of rimsulfuron in green foxtail; however, the addition of mesotrione + atrazine resulted in a 20% decrease in rimsulfuron absorption 7 DAT, as compared to rimsulfuron applied alone. Yellow foxtail absorption of rimsulfuron at 7 DAT was decreased by 11 and 20% when tank mixed with mesotrione or mesotrione + atrazine, respectively. Rimsulfuron applied alone resulted in 6% more herbicide being translocated to the treated tiller in green foxtail at 7 DAT, as compared to an application of mesotrione + atrazine and rimsulfuron. Translocation of rimsulfuron in yellow foxtail was similar when applied alone or in combination with mesotrione or mesotrione + atrazine. Nicosulfuron and rimsulfuron metabolism in both species was similar when applied alone or in combination with mesotrione or mesotrione + atrazine. The reduction of nicosulfuron and rimsulfuron efficacy when tank mixed with mesotrione or mesotrione + atrazine in green foxtail was due to decreased absorption and translocation of nicosulfuron and rimsulfuron. The reduced yellow foxtail efficacy of sulfonylurea herbicides tank mixed with mesotrione is due to lower absorption.