

INTERACTIONS BETWEEN MESOTRIONE AND SULFONYLUREA HERBICIDES. Christopher L. Schuster, Kassim Al-Khatib, and J. Anita Dille, Graduate Research Assistant, Professor, and Assistant Professor, Department of Agronomy, Kansas State University, Manhattan, KS 66502.

Mesotrione is an effective broadleaf herbicide, but may not control a broad spectrum of grass weeds. As a result, atrazine and/or sulfonyleurea herbicides are often mixed with mesotrione for additional grass control. Recent complaints, however, contend that green foxtail and shattercane control is reduced when mesotrione is applied in combination with sulfonyleurea herbicides. Greenhouse and field experiments were conducted to evaluate interactions between mesotrione or mesotrione + atrazine and sulfonyleurea herbicides when applied to green foxtail and shattercane. In the greenhouse, grass seedlings were treated with the label use rate of mesotrione (105 g ha^{-1}), mesotrione + atrazine ($105 + 757 \text{ g ha}^{-1}$), foramsulfuron (37 g ha^{-1}), nicosulfuron (35 g ha^{-1}), or a combination of mesotrione or mesotrione + atrazine with foramsulfuron or nicosulfuron. Visual ratings of plant injury were determined 21 days after treatment (DAT) based on a scale of 0 to 100%. In a separate field study, green foxtail and shattercane seedlings were treated with mesotrione (52.5 or 105 g ha^{-1}), mesotrione + atrazine, foramsulfuron, nicosulfuron, nicosulfuron + rimsulfuron ($26 + 13 \text{ g ha}^{-1}$), or a combination of mesotrione or mesotrione + atrazine with foramsulfuron, nicosulfuron, or nicosulfuron + rimsulfuron. Grass injury was visually assessed 21 DAT as described above. In the greenhouse, shattercane had 91 and 93% visual injury following applications of foramsulfuron and nicosulfuron, respectively. The addition of mesotrione to foramsulfuron or nicosulfuron decreased visual injury to 81 and 72%, respectively. Antagonistic interactions were also observed with green foxtail. Furthermore, the addition of mesotrione + atrazine to foramsulfuron or nicosulfuron resulted in antagonistic interactions, which decreased the visual injury of green foxtail and shattercane. Similar antagonistic interactions were observed under field conditions; where the efficacy of foramsulfuron, nicosulfuron, or nicosulfuron + rimsulfuron was reduced by tank mixing with mesotrione or mesotrione + atrazine. Antagonistic effects were less when the reduced rate of mesotrione was applied with the sulfonyleurea herbicides. Results from both the greenhouse and field study showed that the addition of sulfonyleurea herbicides to a mesotrione application will result in decreased efficacy of sulfonyleurea herbicides on green foxtail and shattercane.