

IMPACT OF SITE SPECIFIC WEED MANAGEMENT ON WEED POPULATIONS. Jeffrey W. Vogel, J. Anita Dille Phillip W. Stahlman, Graduate Research Assistant, Assistant Professor, and Professor, Kansas State University, Manhattan, KS 66506.

Integrated and Site Specific Weed Management (ISSWM) provides an opportunity to manage weeds where they are using advanced application technology and knowledge of spatial locations of weed species. A two-pass system for ISSWM is proposed in order to minimize risk of missing weed populations: a variable or low rate preemergence herbicide followed by a map-based postemergence herbicide application. The objective of this study was to assess the outcome of weed populations and crop yield in response to ISSWM program. A field study was conducted at the Department of Agronomy Ashland Bottoms Research Farm, south of Manhattan in 2003. A preemergence herbicide premix of flufenacet and metribuzin ($204 \text{ g ha}^{-1} + 302 \text{ g ha}^{-1}$) was applied in 7.62 m strips (10 rows wide) at 0, 0.33, 0.67, and 1x the recommended rate on June 11. On July 9 weed species were identified, classified into size categories, and counted in 1 m^2 quadrat at the center of each 7.62 x 7.62 m grid superimposed on the field and was assumed to represent the population of that grid cell. Each preemergence strip was split into a site specific treatment using the most economical herbicide rates assigned to each 7.62 x 7.62m grid cell and a random treatment in which a 7.62 x 22.9 m strip randomly received 0, 0.5, 0.75, and 1x the recommended rate. The postemergence herbicide chosen was bentazon, sethoxydim, aciflourfen, and COC ($227 \text{ g ha}^{-1} + 85 \text{ g ha}^{-1} + 57 \text{ g ha}^{-1} + 1.2 \text{ L ha}^{-1}$) and applied July 10. Weed counts were taken 3 weeks after treatment and crop yield was obtained using a combine equipped with a yield monitor on October 23. Palmer amaranth, common waterhemp, shattercane, velvetleaf, prickly sida, and yellow foxtail were observed. Frequency distribution of July 9 weed counts with increasing preemergence herbicide rate shifted to lower densities and lots of zero counts. Compared to a uniform postemergence application of the 1x recommended rate, the site specific treatment only required 10% of the area to be treated across all preemergence rates. In total, herbicide use was reduced by 94% in the site specific treatment. In general, yields varied across the field site due to other factors and no real differences were observed by preemergence or postemergence treatments.