

WEED POPULATION DEVELOPMENT OVER TWO YEARS OF SITE SPECIFIC WEED MANAGEMENT. Jeffrey W. Vogel, J. Anita Dille, Phillip W. Stahlman, Robert E. Wolf, Graduate Research Assistant, Assistant Professor, Professor and Assistant Professor, Kansas State University, Manhattan, KS 66506.

To reduce cost associated with sampling for site specific weed management (SSWM), it is suggested that if weed populations remain constant in time and space, one intensive weed population survey could be used for future SSWM decisions. The objectives of this study were to describe weed species composition and evaluate total herbicide usage and evaluate temporal and spatial stability of weed populations through several years of SSWM. A field study was initiated in 2003 and repeated in 2004 at the Department of Agronomy Ashland Bottoms Research Farm located near Manhattan, KS. Soybean was planted and a premix of flufenacet and metribuzin was applied preemergence in 7.62 m wide strips at 0, 0.33, 0.67, and 1x the recommended rate. Prior to the postemergence application, weed species were identified, classified into size categories, and counted in 1 m² quadrat at the center of each 7.62 x 7.62 m grid cell that was superimposed on the field and the quadrat represented the population for that grid cell. Each PRE strip was split into a site specific treatment using the optimal economical herbicide rates assigned to each cell and a random treatment in which a strip of 3 cells randomly received 0, 0.5, 0.75, and 1x the recommended rate. Weed counts were taken 3 weeks after treatment in each year. Overall the percent of quadrats with weeds present and mean density (# m⁻²) were greater for almost every weed species in 2004 as compared to 2003. In response to the weed populations, SSWM using the optimal economic herbicide rate required treatment of 10 and 56% of the area and used only 8 and 40% of the herbicide as compared to an uniform 1x application across all PRE herbicide strips in 2003 and 2004, respectively. Temporal stability based on correlation coefficients were strong between PRE03 and PRE04 surveys and between POST03 and PRE04 surveys in the 0 and 0.33x PRE strips for key weed species. Spatial dependence, or patchiness, was low for key weeds emerging through any rate of PRE herbicide, while it was species specific at 0x PRE.