

EVALUATION OF PLANTING DATE AND SOIL APPLIED HERBICIDES FOR INTEGRATED CONTROL OF WATERHEMP IN SOYBEAN. Sean Evans and Gordon Roskamp, Crop Systems Educator and Professor of Agriculture, University of Illinois Extension and Western Illinois University, Macomb, IL 61455.

Within the last decade, adequate control of common waterhemp in soybean has deteriorated in many regions of Illinois. The development of resistance to protox-inhibiting herbicides, increasing tolerance to glyphosate products, prolific seed production, and extended periodicity of waterhemp emergence have been cited as factors contributing to unsatisfactory control. Integrating weed management strategies has been suggested as a means to better manage waterhemp populations, but little research has been directed at testing the application of multiple strategies. Field research was initiated at Macomb, IL in 2003 to compare waterhemp densities and control ratings of 12 soil-applied herbicides (alachlor, metolachlor, metribuzin, metolachlor + metribuzin, metribuzin + flufenacet, flumioxazin, flumioxazin + cloransulam, sulfentrazone, sulfentrazone + chlorimuron, sulfentrazone + cloransulam, dimethenamid, and pendimethalin) applied immediately following planting of narrow-row soybeans at three dates (03-May, 16-May, and 02-June). The experiment was implemented with a factorial arrangement of treatments in a split-plot design with planting date comprising the main-plot factor and soil-applied herbicide comprising the sub-plot factor. Main-plots were arranged in randomized complete blocks with three replications. Tillage was performed immediately prior to planting. All plots were hand-weeded to remove other broadleaf weed species, and clethodim was used to control grasses.

Waterhemp densities in the weedy controls on 18-July, 2003 were 8, 5, and 0.2 plants m⁻² for the first, second, and third planting dates, respectively. Density counts conducted in early September did not differ from those conducted in early July indicating that most waterhemp present was associated with early emerging cohorts. All soil-applied herbicides provided a significant reduction in waterhemp densities for all three planting dates, but differences in control were evident among herbicides. An overall significant interaction between planting date and herbicide treatment was observed indicating an environmental influence on herbicide efficacy in some instances. Soybean seed yield did not differ among herbicide treatments or planting dates. However, season-long competition with common waterhemp resulted in yield reductions of 23, 9, and 4 percent compared to treated plots for the first, second, and third planting dates, respectively. This research indicates that delayed seedbed preparation associated with later planting in combination with soil-applied herbicides has the potential to increase the likelihood of satisfactory control of waterhemp by dramatically reducing initial populations, especially when used as a component of a two-pass herbicide program.