

FIELD SURVEY OF PPO-RESISTANCE IN ILLINOIS WATERHEMP POPULATIONS. Daniel D. Schnitker, Bryan G. Young, Julie M. Young, and Joseph L. Matthews, Graduate Research Assistant, Professor, and Researchers, Department of Plant, Soil, and Agricultural Systems, Southern Illinois University, Carbondale, IL 62901.

Prior to the introduction of glyphosate-resistant soybeans, PPO-inhibiting herbicides were frequently used for postemergence control of common waterhemp. Reports from growers experiencing inadequate control of common waterhemp with this chemistry led to the confirmation of PPO-resistant biotypes in Illinois in 2002. Along with crop safety concerns, challenges with managing common waterhemp contributed to the widespread adoption of glyphosate-resistant soybeans. The objective of this study was to quantify the incidence of PPO-resistance in common waterhemp populations sampled throughout Illinois. In fall 2006, seed was collected from mature common waterhemp plants found in 77 random Illinois fields in 43 counties, as well as 26 fields in 12 counties that were suspected to contain PPO-resistant biotypes. Plants grown from these seed sources and known PPO-susceptible sources were screened for resistance to lactofen at two rates, 220 and 660 g ai/ha. At 21 DAT, plant responses were categorized as resistant or susceptible based on visible injury ratings as described in previous literature. Typical injury symptoms of rapid necrosis from lactofen were observed as well as various levels of regrowth on plants that survived the herbicide application. Approximately 25% (19 of 77) of the random collections were confirmed to contain PPO-resistant biotypes. All but one of the suspected seed collections was confirmed to exhibit some level of resistance. From this screen, PPO-resistant biotypes were found in 21 counties in Illinois, mostly in the south-central and western areas of the state. The geography encompassed by PPO-resistant common waterhemp in Illinois is much greater than previously documented or suspected since the shift to glyphosate-based weed management in soybean. Therefore, growers should not assume that the postemergence PPO-inhibiting herbicides they once utilized in the 1990s will still be effective to manage common waterhemp populations in the future if glyphosate performance declines.