FIELD SURVEY OF WEEDS OBSERVED IN KENTUCKY BEFORE AND AFTER WIDESPREAD ADOPTION OF GLYPHOSATE-TOLERANT SOYBEANS. T. Saphangthong*, M.W. Marshall, J.D. Green, and J.R. Martin. Graduate Research Assistant, Research Specialist, Extension Professor, Extension Professor, Department of Agronomy, University of Kentucky, Lexington, KY 40546-0312.

Over 80% of the soybean acres are now planted with varieties containing the Roundup Ready® technology that are glyphosate-tolerant. Field surveys were conducted initially in ten counties during 1998 and 1999 before the widespread adoption of glyphosate-tolerant soybeans in Kentucky. Field surveys were repeated in seven counties during 2004 to determine if adoption of this technology has resulted in a shift in the composition of weed species observed in soybean production. Fields were surveyed at 3 to 5 weeks after planting. Ideally this would allow time for weeds to emerge after crop planting, but before a field was treated with an in-season postemergence herbicide, such as glyphosate. The field scouting method involved recording all weed species present at a survey point. Survey sites were determined by walking in a S-shaped pattern by counting the number of paces that divides a field into five acre segments. Since the survey sites were within each five acre segment, this field survey method provided a technique for determining the frequency of occurrence for each weed species observed by calculating the number of survey sites it occupied to the total number of sites surveyed within each field. The relative frequency of occurrence of the weed species observed within a county or for a state-wide summary could also be calculated by using this survey method. Sixty-four different soybean fields representing approximately 2,730 acres were surveyed during 1998 and 1999. A total of 30 fields representing approximately 1,680 acres were surveyed in 2004. Nearly all fields surveyed have been in a corn-soybean or corn-wheat-soybean rotation. Because of this crop rotation with corn, most fields had been in soybean production only 3 of the past 6 years. For the 2004 survey, glyphosate-tolerant soybean varieties had been grown 3 or more years in 21 of the 30 fields surveyed. Ninety-seven different weed species were observed in soybean fields across Kentucky with initial survey during 1998 and 1999. Prickly sida, johnsongrass, honeyvine milkweed, wild garlic, and ivyleaf morningglory were among the top five most frequent species observed (≥22% of the sites surveyed). The remaining top ten species included smooth pigweed (21%), volunteer wheat (20%), pitted morningglory (18%), trumpetcreeper (16%), and horseweed (16%). In 2004, one-hundred different weed species were observed in 2004. Horseweed, smooth pigweed, johnsongrass, common pokeweed, and prickly sida were among the top five most frequent species observed (≥20% of the sites surveyed). The remaining species in the top ten included dandelion (19%), fall panicum (18%), trumpetcreeper (17%), pitted morningglory (16%), and eastern black nightshade (16%). When comparing the two survey periods, the presence of horseweed increased from the tenth most common species (16% of the field sites surveyed) in 1998 and 1999 to the most frequently observed species (36%) in 2004. Furthermore, horseweed was observed at 50% of the survey sites in the 21 fields which have been planted with glyphosate-tolerant soybean for at least 3 years while horseweed was only found in 16% in fields with less than 3 years of glyphosate-tolerant technology. In all fields surveyed, the other weed species that increased were common pokeweed (21%) and dandelion (19%). However, presence of prickly sida declined sharply from 36% in 1998 and 1999 to 20% in 2004. Johnsongrass also declined to 23% of the survey sites in 2004 from 34% in the previous survey, but it remained in the top three most observed weeds. Weed species that also declined include honeyvine milkweed, ivyleaf morningglory, yellow nutsedge, and large crabgrass. Other species that remained nearly the same in frequency of occurrence across both survey periods and occupied 10% or greater of the survey sites included smooth pigweed, fall panicum, trumpetcreeper, pitted morningglory, eastern black nightshade, and hophornbeam copperleaf.

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