

DOCUMENTING THE EXTENT OF GLYPHOSATE-RESISTANT COMMON RAGWEED. Reid J. Smeda, Justin M. Pollard, Associate Professor and Graduate Research Assistant, Division of Plant Sciences, University of Missouri, Columbia, MO 65211; Brent E. Sellers, Assistant Professor, Range Cattle Research and Education Center and Department of Agronomy, University of Florida-IFAS, Ona, FL 33865.

In a long-term soybean production system in central Missouri, continuous use of glyphosate for weed management has selected an herbicide-resistant population of common ragweed. The extent of resistance to glyphosate from both a population and geographical perspective is not known. A unique morphological characteristic of plants in the resistant population is that the majority of plants exhibit a very short growth habit, even in the absence of glyphosate. In September 2004, seed from 338 individual common ragweed plants (sample point) was harvested over a 180 ha area, and a hand-held global positioning satellite instrument was used to document the location of each plant. Plants were chosen at random throughout the infested area, along field edges, and in nearby areas (roadsides, field edges of adjacent areas, etc.). Seed dormancy was broken by placing seeds in moist sand at 4 C for 75 days. All seeds from each sample were then placed in two polypropylene flats containing a professional potting mix. Seed from a common ragweed population known to be glyphosate-resistant (JRW) and glyphosate-susceptible (BRAD) were also sown and used for confirmation of resistance or susceptibility for sampled plants. Emerging seedlings were thinned at random to a final population of up to 20 plants per flat. At 20 cm in height, seedlings were treated with 1.68 kg ae/ha of glyphosate and individual plants mapped according to growth morphology: stunted (S), intermediate (I), and normal (N).

Three weeks following treatment, each plant was visually evaluated for damage and the number of plants denoted with 0 to 89% (resistant) and 90 to 100% (susceptible) injury. Of all samples collected, seed from 245 sample points emerged. For the BRAD plants (350 plants assessed), 96.6, 3.4, and 0% were categorized as N, I, and S, respectively. Mean injury to BRAD plants was 94.7%. For JRW plants (479 plants assessed), 12.1, 25.3, and 62.6% were categorized as N, I, and S, respectively. Mean injury to JRW plants was 18.9%. Of the 245 sample points evaluated, 86.4% contained plants that exhibited 0 to 89% injury. Most of the glyphosate-resistant plants appear concentrated in a 20 hectare area, but resistant plants had spread along a roadside at least 60 meters from the infested field. For areas with suspected glyphosate-resistant weed populations, sampling areas potentially infested can clarify the extent of resistance.