

CROPPING SYSTEM EFFECT ON THE GROWTH OF FOUR WEED SPECIES. Rachel B. Paskey and Robert G. Hartzler, Graduate Student and Professor, Department of Agronomy, Iowa State University, Ames, IA 50011.

Field experiments were conducted in central Iowa to determine the effects of two cropping systems on the growth of common waterhemp, common lambsquarters, giant ragweed, and velvetleaf. The cropping systems were a corn-soybean rotation relying on convention inputs and a low-external input system based on a corn-soybean-oat-alfalfa rotation. The cropping systems have been in place since 2002. Experiments were conducted during the soybean phase of the rotations. Between 2002 and 2007, soybean in the four-year rotation out yielded the soybean in the corn-soybean rotation in five out of six years. Our hypothesis was that small-seeded weeds would be affected more by changes in soil quality and crop growth between the two cropping systems than large-seeded weeds.

The first experiment evaluated emergence and survival of the four species under a common weed management program. Glyphosate was applied to all plots on June 30th, 2008 at a rate of 0.75 lbs ae/ac. The majority of giant ragweed and common lambsquarter emerged prior to soybean planting, whereas the greatest emergence of waterhemp and velvetleaf was between planting and the postemergence glyphosate application. No differences in emergence or survival were found between the rotations within weed species. A second study evaluated the growth of the four weed species in the absence of any control tactics. Seeds were planted immediately following planting and when soybean were at the V2 stage. While there was no difference in soybean yields in 2008 between the rotations, those in the two-year rotation were shorter than those in the long rotation. There were no differences in biomass of common waterhemp, common lambsquarters, and giant ragweed between the two rotations. Velvetleaf plants in the two-year rotation produced less biomass than those in the four-year rotation. Velvetleaf plants in the longer rotation were also taller than their counterparts in the short rotation. Results from the weeds planted at the soybean V2 stage did not show differences in growth between the two cropping systems.