

WEED SHIFTS IN NO-TILL GLYPHOSATE-TOLERANT CROPS IN SEMIARID AREAS OF THE GREAT PLAINS. Gail A. Wicks, Professor, University of Nebraska, West Central Research and Extension Center, North Platte, NE 69101; Phillip W. Stahlman, Professor, Kansas State University, Agricultural Research Center, Hays, KS 67601-9228; Jeffrey M. Tichota, Monsanto, Littleton, CO 80122; and Troy M. Price, Assistant Scientist, Kansas State University, Northwest Research-Extension Center, Colby, KS 67701.

Studies were conducted at North Platte, NE and Colby, KS to determine weed shifts after 4 years of glyphosate applications in a continuous corn and corn-soybean rotation using glyphosate-tolerant crops. Each phase of the rotation occurred each year and glyphosate was applied to kill all weeds before no-till planting corn or soybean. Four weed control treatments were compared. Glyphosate at 0.38 or 0.75 lb ae/A was applied twice POST to separate plots in each rotation each year. The check was a standard non-glyphosate herbicide treatment for corn and soybean. The fourth treatment consisted of using the low rate of glyphosate twice in one year and the standard herbicide treatment in the next year. Weeds were most difficult to control in the standard herbicide treatment, so each year we raised rates or substituted herbicides.

Changes in weed species occurred at both locations during the 4 years with new species occurring each year. At North Platte, 50+ species were identified in 2000 and 2001. At harvest time, 24 species were present in 1998, 20 in 1999, 29 in 2000, and 31 were present in 2001. Kochia was the predominate species at North Platte in 1998, with 100% occurrence. In 2001, kochia occurrence was 50% at harvest time in plots treated with glyphosate. The five weed species with the highest frequency of occurrence were longspine sandbur (89%), tumble pigweed (89%), green foxtail (72%), Virginia groundcherry (72%), and common purslane (69%). Tumble pigweed had the most biomass in the glyphosate-treated plots while longspine sandbur biomass was greatest in the non-glyphosate treated plots. At Colby, 35 species were present in September 2001. Puncturevine was the most frequent weed species in every plot. In the pigweed family, frequencies were in the following order: redroot > Palmer > tumble > waterhemp > prostrate. In the grass species, prairie cupgrass frequency was highest followed by green foxtail > longspine sandbur > barnyardgrass > windmillgrass > large crabgrass = witchgrass. Prairie cupgrass, which is tolerant to glyphosate, was absent prior to 2000. In no year was two applications of glyphosate after crop emergence enough to prevent seed production of late germinating weeds. In semiarid areas of the central Great Plains, crop canopies often are insufficient to prevent late germinating weed from producing seeds. These seeds replenish the soil seedbank and present future weed problems.