GLYPHOSATE-RESISTANT CROP EFFECT ON WEED DYNAMICS IN WHEAT. George O. Kegode and Mark G. Ciernia, Assistant Professor and Research Specialist, North Dakota State University, Fargo, ND 58105.

Weed species diversity and density in wheat was evaluated for the initial 3 yr of a long-term weed management experiment initiated near Fargo, North Dakota, in 2002. This experiment is designed to study weed population dynamics in glyphosate-resistant corn, glyphosate-resistant soybean, and conventional wheat cropping systems. The cropping systems and associated weed control were (i) conventional, with one postemergence herbicide treatment plus preplant and postharvest tillage; (ii) conventional, with two or more postemergence herbicide treatments plus preplant and postharvest tillage; and (iii) no-till, with preplant and one postemergence herbicide treatments. The study was a randomized complete block with three replicates, and treatments were established in the first year such that each crop within a system was present each year. Spring wheat was seeded in 2002 where conventional soybean was grown in 2001, and was seeded in 2003 where glyphosate-resistant soybean was grown the previous year. In 2004, spring wheat was seeded where glyphosate-resistant soybean was seeded in 2003 and glyphosate resistant corn in 2002. Weed composition and density were evaluated in wheat prior to planting, at herbicide treatment, and post-harvest from ten randomly placed 0.1-m^2 quadrats within each plot. Common lambsquarters, dandelion, green and yellow foxtail, kochia, prostrate spurge, redroot pigweed, wild buckwheat, wild mustard, and volunteer soybean comprised 92% of weeds across evaluation times in 2003. In 2004, the diversity of weed species that comprised greater than 90% of the total population remained largely the same except for dandelion and wild mustard, which were largely replaced by common purslane and Venice mallow. In 2002, 11, 76, and 7% of the weeds in wheat were present before planting, when herbicides were applied, and post-harvest, respectively. In 2003 and 2004, greater than 97% of the weeds in wheat were present when herbicides were applied. In 2002, greater than 50% of weeds were in the no-till regime regardless of evaluation time, whereas in 2003 and 2004, weeds were evenly distributed among tillage regimes when herbicides were applied. Total weed densities in wheat were 677, 186, and 86 plants m^{-2} in 2002, 2003, and 2004, respectively. The low weed densities in 2003 and 2004 may have been due to effective weed control in glyphosate-resistant crops and early wheat seeding.

2004 North Central Weed Science Proceedings 59:93.