RESIDUAL ACTIVITY OF FALL-VERSUS SPRING-APPLIED HERBICIDES IN NO-TILL SOYBEANS IN MICHIGAN AND OHIO. Chad D. Lee and Mark M. Loux, Academic Specialist, Department of Crop and Soil Sciences, Michigan State University, East Lansing MI 48824, and Professor, Department of Horticulture and Crop Science, The Ohio State University, Columbus, OH 43210.

Populations of winter annual weeds in no-till fields have increased over the past several years. A study was conducted in 2001 in Ohio and Michigan comparing weed control following fall versus spring herbicide applications. The objectives were to determine which herbicide programs prevent the need for a spring burndown herbicide and which herbicide programs provide residual control of summer annual weeds throughout the growing season. Herbicide programs investigated included glyphosate at 841 g ae ha^{-1}, chlorimuron ethyl + metribuzin + tribenuron methyl at 28 + 115 + 5.25 g ai ha^{-1}, chlorimuron ethyl + sulfentrazone + tribenuron methyl at 26.9 + 132 + 5.25 g ai ha^{-1}, imazaquin + glyphosate at 101 + 628 g ae ha^{-1}, imazethapyr + glyphosate at 70 + 628 g ae ha^{-1}, flumetsulam + metribuzin at 56 + 210 g ai ha^{-1}, paraquat + metribuzin 701 + 210 g ai ha^{-1}, and metribuzin at 421 g ai ha^{-1}. Each herbicide program included 2,4-D at 560 g ai ha^{-1} and each program was applied in the fall (FALL), the early spring (SPRING) (42 d pre-plant (DPP) in Ohio and 20 DPP in Michigan), and at 7 DPP. Weeds were allowed to compete until soybeans reached R1 growth stage at which time glyphosate at 841 g ae ha^{-1} was applied. In Ohio, all FALL programs provided 100% control of common chickweed, while all SPRING programs except metribuzin provided 98% control of common chickweed. Only glyphosate and paraquat + metribuzin applied 7 DPP provided greater than 98% control of common chickweed at planting. Similar observations between FALL, SPRING, and 7 DPP applications on winter annuals were observed in Michigan. Giant ragweed control at 28 d after planting (DAP) in Ohio, was greater than 75% for FALL applications containing chlorimuron ethyl or imazaquin. SPRING applications of chlorimuron ethyl + sulfentrazone + tribenuron methyl, imazethapyr + glyphosate, and flumetsulam + metribuzin provided greater than 75% control of giant ragweed. However, all 7 DPP programs except metribuzin provided greater than 90% control of giant ragweed. In Michigan, the loss of residual activity in FALL programs was most evident with annual grasses. Control of annual grasses 28 DAP was less than 70% for all FALL herbicide programs, while SPRING programs containing chlorimuron ethyl or imazethapyr provided greater than 80% control. All 7 DPP programs except glyphosate and paraquat + metribuzin provided at least 80% control of annual grasses. In most cases, soybean yield was not impacted by herbicide programs or timing of those programs. Most herbicide programs provided better winter annual weed control at planting when applied FALL or SPRING compared to 7 DPP. Most herbicide programs provided better summer annual weed control when applied closer to planting. Applications made in the early spring may be the best balance between controlling winter annual weeds before planting and providing residual activity of summer annuals through the growing season.