

**JOHNSONGRASS AND PIGWEED CONTROL IN
CONVENTIONAL-TILL AND NO-TILL SYSTEMS
WITH ROUNDUP READY® COTTON**

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Abstract

An experiment was conducted during 1997-99 with Roundup Ready® (glyphosate-tolerant) cotton (PM 1244 RR in 1997, PM 1220 RR/BG in 1998 and DP 5415 RR in 1999) grown in conventional-till and no-till production systems and infested with a natural population of perennial johnsongrass and Palmer amaranth. The soil type was silt loam with 1.1 percent organic matter and pH 6.4. The area was not irrigated. A split-plot design with six replications was used. Tillage systems were main-plot treatments consisting of 16, 40-inch-wide rows by 40 feet long. Conventional-till consisted of subsoiling between rows (45° to row direction in 1996) and hipping rows each fall, re-hipping each spring, operating a bed conditioner to reduce bed height and/or destroy vegetation, and in-season cultivation two or three times each year leaving a 12-inch undisturbed band centered on the row. Herbicides applied at planting and in-season were made to a 20-inch-wide band centered on the cotton row. No-till treatments consisted of an initial subsoiling and hipping to establish a bed for planting and reducing the bed to the proper planting height with a bed conditioner in the fall of 1996. There was no further tillage. Herbicides were applied broadcast.

Sub-plot treatments were 1) trifluralin (Treflan®) 0.75 lb ai/A PPI (preplant incorporated) with conventional-till or pendimethalin (Prowl®) 1.0 lb ai/A PRE (preemergence) with no-till followed by (fb) fluometuron (Cotoran®) 1.25 lb ai/A + pyrithiobac (Staple®) 0.047 lb ai/A PRE fb Cotoran 1.0 lb ai/A + MSMA (Herbicide 912) 1.5 lb ai/A PODIR (directed postemergence) fb cyanazine (Cy-Pro®) 0.6 lb ai/A + Herbicide 912 1.5 lb ai/A PODIR fb fluazifop (Fusilade®) 0.18 lb ai/A OT (over-the-top) if needed fb diuron lay-by 1 lb ai/A; 2) Cotoran 0.63 lb ai/A + Staple 0.023 lb ai/A PRE fb glyphosate (Roundup Ultra®) 1.0 lb ai/A OT 3-leaf cotton fb Roundup Ultra 1.0 lb ai/A PODIR two times in 1997, one time each in 1998 and 1999; 3) Roundup Ultra 1.0 lb ai/A OT 3-leaf cotton fb Roundup Ultra 1.0 lb ai/A PODIR two times in 1997, one time each in 1998 and 1999; and 4) no herbicide check (cultivated between rows in conventional-till). All treatments had preplant "burn-down" applications of Roundup Ultra 0.5 or 1.0 lb ai/A or clethodim (Select®) 0.094 lb ai/A as needed before planting. Roundup, Select, and Fusilade were applied in 10 gallons per acre total broadcast

volume while other herbicides were applied in 20 gallons per acre.

Cotton stand was not affected with tillage method or herbicide treatment in 1997 or 1998. In 1999, stand was lower with no-till than with conventional-till. The conventional herbicide sub-plot treatment in 1999 had a lower stand than either treatment with Roundup in the system, but was higher than the no herbicide check. In all years, cotton stand in all treatments was less than is generally accepted for maximum yield. The no herbicide check sub-plot treatment had less stand in all years than the herbicide treatments. This was due to the severe competition from the large infestation of johnsongrass and Palmer amaranth. This large weed infestation prevented any cotton yield in any year. Seed cotton yield in 1997 and 1999 was not different for main-plot no-till and conventional-till systems. In 1998 the no-till system had higher yield than the conventional-till (1686 vs. 1390 lb/A). The sub-plot treatment of Roundup alone in 1997 had lower yield than the treatment with low rates of Cotoran and Staple PRE fb Roundup or the conventional herbicide treatment of Treflan PPI (conventional-till) or Prowl PRE (no-till) + Cotoran and Staple PRE fb Cotoran + MSMA and Bladex + MSMA PODIR and Fusilade OT. In 1998, Cotoran + Staple PRE fb Roundup OT + PODIR had higher yield than the other herbicide treatments which were not different. In 1999 both treatments with Roundup had higher yields than the treatment with conventional herbicides and were not different from each other.

Rhizome johnsongrass control in late May 1997 and 1998 with the main-plot conventional-till treatment was lower than with no-till. However, main-plot treatments were not different in 1999. The sub-plot no herbicide check treatment was lower in johnsongrass control than all herbicide treatments in all years. Among sub-plot herbicide treatments, the Roundup only treatment was lower in late May 1997, each sub-plot treatment was different in 1998, and there were no differences in early June 1999. Rhizome johnsongrass control in July resulted in lower control for the main-plot conventional-till treatment compared with no-till in all years. The sub-plot Roundup only treatment was lower than other herbicide treatments in 1997. In 1998, control with the low rate Cotoran + Staple PRE fb Roundup treatment was higher than the treatment with conventional herbicides PRE fb PODIR but was not different from the Roundup only treatment. The Roundup only treatment was not different from the conventional herbicides PRE fb PODIR treatment. In 1999, all treatments were different with control highest with the conventional herbicides PRE fb PODIR treatment. The next highest control was with the low rate PRE fb Roundup treatment. Least control was with Roundup only.

Palmer amaranth control with main-plot treatments in late May 1997 and 1998 were not different. In early June 1999, Palmer amaranth control with the main-plot conventional-till treatment was higher than with no-till. The sub-plot no herbicide treatment was lower than all the herbicide treatments in May/June all years. Among sub-plot herbicide treatments, the Roundup only treatment was lower than the other sub-plot treatments in 1997 while in 1998 and 1999 the conventional herbicides PRE + PODIR treatment was lower. Treatments with Roundup were not different in 1998 or 1999. With Palmer amaranth control in July 1997 the main-plot conventional-till treatment was lower than no-till. In 1998 and 1999 there was no difference. The sub-plot treatment with low rate PRE fb Roundup (Treatment 2) was higher in all years. There was no difference between the conventional herbicides PRE fb PODIR and Roundup only treatments in 1997 and 1998 but the Roundup only treatment was higher in 1999.