LARGE PLOT COMPARISON OF PRE VS. NO PRE HERBICIDES IN ROUNDUP READY® (GLYPHOSATE-TOLERANT) COTTON

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Abstract

Recent concern over low yields of Roundup Ready® cotton varieties in small plot research has prompted investigation into these production practices on a large plot scale. Three experiments were conducted in Louisiana and these represented the two major cotton producing regions of the state and included two locations in the Red River Valley near Alexandria, and the other in the Alluvial floodplain of Northeast Louisiana.

At the first Alexandria location, on a producer field, Delta and Pineland 5415RR and Delta and Pineland 5415 (conventional variety) were planted on May 14, 1999. The experiment design was a Randomized Complete Block with three reps. Each plot was eight rows (40 inch spacing), and soil type was a silt loam. Final plot sizes ranged from 0.05 to 0.08 A. Treatments included two postemergence (Post) applications of Roundup Ultra (glyphosate) (1.0 lb ai/A each), one application of Roundup Ultra (1.0 lb ai/A) with a preemergence (Pre) combination of Meturon (fluometuron) plus Prowl (pendimethalin) (1.2 lb ai/A + 0.75 lb ai/A, respectively), and a comparison treatment of Meturon plus Prowl (1.2 lb/A + 0.75 lb/A, respectively, Pre), and a Post application of Staple (pyrithiobac) (0.063 lb ai/A) and Fusilade DX (fluazifop) (0.187 lb ai/A).

The second experiment was conducted at the Dean Lee Experiment Station, south of Alexandria. At this location, Delta and Pineland 458 BG/RR and Stoneville 474 (standard) were planted on May 6, 1999 on 38 inch rows on a silt loam soil. Experimental design and replicates were as mentioned previously. Plots were 20 rows in width and approximately 0.15 A. Treatments included a single Post application of Roundup Ultra (1.0 lb/A) with a layby application of Caparol (prometryn) + MSMA (0.5+1.5 lb ai/A); a conventional herbicide program used with the Roundup Ready variety consisting of a Pre application of Meturon+Dual II Magnum (s-metolachlor) (1.2+0.95 lb ai/A, respectively), a Post-Directed application of Meturon+MSMA (0.8+1.5 lb ai/A, respectively), and a layby application of Caparol+MSMA (0.5 +1.5 lb ai/A, respectively). The same herbicide program was also applied to a conventional variety (Stoneville 474).

At the Jonesville location, Suregrow 125 BG/RR and Stoneville 474 (standard) were planted on May 3,1999 in a silty clay soil. Plots were 6 rows with 40 inch spacing. Experimental design and replicates were as mentioned previously. Treatments were modified slightly at this location and included a single application of Roundup Ultra (1.0 lb ai/A) with no Pre herbicide, one application of Roundup Ultra (1.0 lb ai/A) with a Pre combination of Meturon plus Prowl (0.8 + 0.75 lb/A, respectively) and a grower standard of Meturon + Dual + Staple (0.8 + 0.75 + 0.06 lb/A, repectively). An additional Post application of Staple (0.03 lb/A) was also made.

Weed control evaluated on the producer field near Alexandria included broadleaf signalgrass (*Brachiaria platyphylla*) and a mixture of several pigweed (*Amaranthus*) species. No differences in broadleaf signalgrass control were observed at 21 or 48 days after planting (DAP), with control ranging form 96 to 100% at either rating date. Pigweed control was less at 21 DAP if no residual herbicide was applied, but these differences were not observed by 48 DAP when control ranged from 93 to 98%.

Weeds evaluated at the Dean Lee Research Station included: pitted morningglory (*Ipomoea lacunosa*), johnsongrass (*Sorghum halepense*), Palmer amaranth (*Amaranthus palmeri*), hophornbeam copperleaf (*Acalypha ostryifolia*), and smellmelon (*Cucumis melo*). Weed control ranged from 95 to 100% for any treatment evaluated. Equivalent seedcotton yields were observed across all treatments in this experiment.

Seedcotton yields at the Alexandria location were less with DP5415RR if a Pre herbicide was used, however, when two Post applications of Roundup Ultra were used without a Pre herbicide, seedcotton yields were equivalent to the non-transgenic DP5415 under a conventional herbicide program.

At the Jonesville location, no differences in seedcotton yields were observed between the transgenic and non-transgenic variety, regardless of the herbicide program.

Reprinted from the *Proceedings of the Beltwide Cotton Conference*
Volume 2:1471-1472 (2000)
National Cotton Council, Memphis TN

Table 1. Seedcotton yields at Alexandria, LA.

Variety/Herbicide	Rate (lb ai/A)	Seedcotton yield (lbs/A)
DP5415RR/		2182
Roundup Ultra	1.0	
fb Roundup Ultra	1.0	
DP5415RR/		2039
Meturon + Prowl (Pre)	1.2+0.75	
Roundup Ultra	1.0	
DP5415/		2345
Meturon + Prowl (Pre)	1.2+0.75	
Staple (Post)	0.063	
Fusilade DX (Post)	0.187	
LSD (0.05)		233

Table 2. Seedcotton yields at Jonesville, LA.

Variety/ Herbicide	Rate (lb ai/A)	Seedcotton yield (lbs/A)
Suregrow 125 B/RR/		3106
Roundup Ultra	1.0	
Suregrow 125 B/RR/		3021
Meturon + Prowl (Pre)	0.8+0.75	
Roundup Ultra	1.0	
Stoneville 474/		3098
Meturon + Dual + Staple (Pre)	0.8+0.75+0.063	
Staple (Post)	0.03	
LSD (0.05)		NS

Table 3. Seedcotton yields at Dean Lee Research Station, near Alexandria, LA.

Variety/ Herbicide	Rate (lb ai/A)	Seedcotton yield (lbs/A)
DPL458 BG/RR/		1019
Roundup Ultra (Post)	1.0	
Caparol + MSMA (Layby)	0.5+1.5	
DPL458 BG/RR/		1151
Meturon + DualII Magnum (Pre)	1.2+0.95	
Meturon + MSMA (Post direct)	0.8+1.5	
Caparol + MSMA (Layby)	0.5+1.5	
Stoneville 474/		1217
Meturon + DualII Magnum (Pre)	1.2+0.95	
Meturon + MSMA (Post direct)	0.8+1.5	
Caparol + MSMA (Layby)	0.5+1.5	
LSD (0.05)		NS