

**THE EFFECTS OF OFF-LABEL GLYPHOSATE APPLICATIONS ON SQUARE
AND BOLL RETENTION IN ROUNDUP READY COTTON**

Jason C. Sanders, Daniel B. Reynolds, Nathan W. Buehring, and David G. Wilson
Mississippi State University
Mississippi State, MS

Abstract

Roundup Ready cotton constituted approximately 86% of the 2002 Mississippi cotton acreage. In spite of current limitations, such as the over-the-top application cutoff at the 4-leaf stage to prevent injury, this high percentage indicates how well farmers have accepted Roundup Ready technology as a weed management tool. Research regarding topical and post-directed tolerance continues to be investigated, and results have been variable. The ability to topically apply glyphosate to cotton after the 4-leaf stage would increase production flexibility, thus improving the utility of Roundup Ready technology.

Experiments were conducted in 2001 and 2002 at the Plant Science Research Center, Starkville, MS and the Black Belt Branch Experiment Station, Brooksville, MS to evaluate the effect of glyphosate rate and placement (topical vs. post directed) on fruit retention, and yield of Roundup Ready cotton. Plots were 40 ft long by 26 ft wide. The cotton variety planted at both locations both years was Deltapine 451 BG/RR. Data collected included plant mapping at squaring and maturity, and yield. Treatments consisted of 0.75 and 1.5 lb ae/A glyphosate, which correspond to 1 and 2X the maximum rate currently labeled. Two treatment regimes were followed for each of the previously defined rates. The first regime consisted of four topical applications at the 1, 4, 8, and 14th leaf stage. The second regime consisted of topical applications at the 1 and 4 leaf stage followed by post directed applications at the 8 and 14th leaf stage. An untreated control was also included in the experiment.

Plant mapping data at squaring indicated 91% square retention with no differences among treatments at either location or year. Mapping data at maturity indicated that at 1.5 lb/A, the high-rate 4 topical applications, early-season boll retention at nodes 6-10 decreased in a range of 18-31% when compared to the untreated at both locations both years. At the same 1.5 lb/A rate with four sequential topical applications, percent boll retention at nodes 16-20 for Brooksville in 2001 and Starkville 2002 increased 20% and 28%, respectively, when compared to the untreated. Seed cotton yield at Brooksville in 2001 and 2002 was decreased 1503 and 612 lbs/A, respectively, by the 1.5 lb/A four topical application treatment when compared to the untreated. Glyphosate-induced early season fruit loss was attempted to be compensated for by setting late-season fruit in the top of the cotton plant. If late season conditions are favorable, compensatory fruit set may minimize early season fruit losses as indicated by the mapping data at maturity. The yield data at Brooksville in 2001 and 2002 indicates the possibility that cotton can not achieve full compensation for early season glyphosate-induced fruit loss if favorable weather conditions are present late in the growing season.