

**TO SPRAY OR NOT TO SPRAY ROUNDUP READY COTTON CULTIVARS
IN SMALL-PLOT PERFORMANCE TRIALS?**

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Abstract

Grower response to glyphosate-tolerant cotton (*Gossypium hirsutum* L.) in the Texas High Plains has been very favorable. New glyphosate-tolerant (Roundup Ready and Bollgard with Roundup Ready “stacked gene”) cultivars continue to be introduced. Tolerance of Roundup Ready cotton cultivars to glyphosate is a Beltwide concern. Are some cultivars more sensitive to over-the-top (POST) and post-directed (PDIR) glyphosate applications? The objectives of this project were to determine if labeled POST plus PDIR glyphosate treatments can affect agronomic or fiber quality performance of glyphosate-tolerant cultivars in small-plot cultivar trials. Nine glyphosate-tolerant cotton cultivars were planted at the Texas Agricultural Experiment Station at Lubbock on 24-May, 2000 and 29-May 2001. The project was furrow irrigated. Experimental design was a split plot with 3 replications. Main plots were cultivars (8 rows wide by 45 ft long). Subplot treatments (4 rows wide by 45 ft long) included a weed-free control and a grower standard glyphosate regime. Grower standard treatment consisted of glyphosate applied at 0.75 lb ae/A (1 qt/acre Roundup Ultra) + ammonium sulfate at 17 lb/100 gal. Glyphosate applications were POST at the 4-leaf stage followed by a sequential PDIR treatment at the 14-node stage. POST treatments were applied to the center two rows using a compressed air spray system calibrated at 10 gpa, 22 psi, 8002 flat fan nozzles, with two nozzles/row. PDIR treatments were applied to the center two rows using a Red Ball hooded sprayer calibrated at 10 gpa, 24 psi, with minimal drift to lower leaves. Plots were harvested with a plot-modified John Deere 482 cotton stripper on 4-Dec 2000 and 7-Nov 2001. Grab samples were obtained from stripper-harvested material then ginned on plot-ginning equipment. Lint samples were submitted to the International Textile Center at Texas Tech University for HVI analysis. In 2000, no significant lint yield differences were observed among cultivars and no cultivar by glyphosate treatment interactions were observed, except for fiber length ($P=0.05$). The grower standard glyphosate treatment had no significant effect on agronomic or fiber properties of any cultivar when compared to the weed-free control. In 2001, lint yield differences among cultivars were noted. No significant cultivar by glyphosate treatment interactions were observed. The grower standard glyphosate treatment program had no effect on agronomic or fiber properties of any cultivar when compared to the weed-free control. In conclusion, the grower standard glyphosate treatment had no consistent significant effect on agronomic or fiber properties of nine cultivars across two years of testing. Results indicate that it is not necessary to spray glyphosate-tolerant cultivars with glyphosate in small-plot performance trials. Current small-plot cultivar field testing methodology is adequate to determine yield, agronomic, and fiber quality performance of glyphosate-tolerant cultivars.