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POST CUTOUT APPLICATIONS OF GLYPHOSATE REDUCES REPRODUCTIVE GROWTH AND YIELD

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Abstract

Growers often apply glyphosate late in the season to reduce the potential for decreased cotton quality and harvest efficiency due to late season weed presence. Often these off label applications are made near cutout with the idea that a set boll is not affected by glyphosate. A green house and field study were conducted to determine if post cutout applications of Roundup Ultra (RU) reduce reproductive growth, lint yield, and fiber quality of glyphosate-resistant (GR) cotton. Secondary objectives were to determine whether shikimic acid accumulates in tissues from glyphosate resistant cotton bolls, indicating inhibition of EPSPS, and to quantify glyphosate-resistant CP4-EPSPS in tissues of developing seeds. In the greenhouse study DP 5414RR was grown in 10" pots at 85°F. Treatments consisted of a check and applications of 1 qt RU applied at cutout + 2 weeks and cutout + 4 weeks. Treatments were replicated 4 times in a RCBD. Plants were box mapped at first cracked boll. The field study was conducted under dry land conditions at the Cherry Farm Unit located in Goldsboro, NC using SG 125RR. Treatments consisted of an untreated check and applications of 1 qt RU at cutout, cutout +2 weeks, and cutout +4 weeks. Treatments were replicated four times in a RCBD. The center two rows were harvested from each plot and 10 plants were box mapped at this time. All glyphosate treatments in the greenhouse study reduced reproductive growth by 30-35% and produced a lower percentage of reproductive weight on upper fruiting sites. Glyphosate applied 4 weeks after cutout in the field reduced lint yield by 177 lb/A. This treatment also produced smaller bolls at nodes 11-15. Shikimic acid did not accumulate in upper bolls of treated plots. CP4-EPSPS was greater in young seed (7 days after anthesis) than older seed (4 weeks after anthesis). In conclusion, post cutout applications can reduce reproductive growth and lint yield. This reduction in reproductive growth is associated with the upper fruiting zone where bolls are still developing at the time of application.