WHAT HAPPENS WHEN ROUNDUP READY™ COTTON IS SPRAYED WITH ROUNDUP® AFTER THE FOUR LEAF STAGE?

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Abstract

Roundup Ready™ cotton is resistant to vegetative injury from Roundup® (glyphosate) herbicide, but subtle effects on reproductive (fruiting) development may occur if Roundup® is applied beyond the 4-leaf stage. Experiments were conducted at Jackson, TN during 1995 and 1996 to determine the effect of Roundup® applied overtop of Roundup Ready™ cotton. In 1995, Roundup® was applied at 3 pints (1.12 lb ae) per acre to Coker 312 RR, Paymaster lines PM 1215RR, PM 1220RR, PM 1244RR, PM 1330RR and PM 1380RR cultivars at the 4-, 5-, and 7-leaf stage.

No visual injury to any of these lines was observed from any application. Percent first harvest was similar from all cultivars and application timings except Coker 312RR, which was 14% lower with application at the 7-leaf stage compared to the untreated hand-hoed control. Coker 312RR and PM 13330RR had 21 and 7% lower total lint yields with applications at the 7-leaf stage and PM 1380 had 11% lower yield from application at the 5-leaf stage but not at the 7-leaf when compared with the respective untreated hand-hoed control.

In 1996 a single application of Roundup Ultra® (glyphosate) at 1.5 pints (0.56 lb ae) per acre was made to weed free Coker 312RR cotton at the 4-, 6-, 8-, 10- and 12-leaf stage of growth. Sequential applications were also made at the 6-,8- and 10-leaf stage following treatment at the 4-leaf stage. No visual injury was noted. Percent first harvest was reduced 4% by Roundup Ultra® applied at the 8- or 10-leaf stage. Total lint yield from any treatment did not differ from the untreated hand-hoed control (P=0.05).

In a similar study with >10 common cocklebur (*Xanthium strumarium)* plants per square foot, Roundup Ultra applied at the 6-leaf stage or sequential applications at the 6-, 8-, or 10-leaf stage following application at the 4-leaf stage produced lint yields equal to the untreated hand-hoed check. Treatment only at the 4-leaf stage permitted cockleburs to emerge after treatment, compete with cotton and reduce lint yield by 87%. Delaying treatment beyond the 6-leaf stage allowed early season competition from cockleburs that cotton was unable to compensate for later in the season. Roundup Ultra® controlled cockleburs plants emerged at the time of application.

Based on these studies conducted under optimum conditions for herbicide activity and good cotton production, the post overtop application window for Roundup Ultra® on Roundup Ready ™ may be wider than reported, especially in situations where the loss from weeds may exceed the loss from Roundup® effects on reproductive development. Research to better define the injury:benefit ratio for Roundup Ultra® appled to Roundup Ready™ later than the four-leaf stage is planned for 1997.

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