

**WEED CONTROL IN ROUNDUP READY™
COTTON IN LOUISIANA**

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Abstract

Weed management programs utilizing genetically transformed cotton for tolerance to Roundup and subsequent utility in existing weed management programs provide options to: control weeds in conventional and reduced tillage; allow a wide window for effective application timing; economically control a broad spectrum of weeds; and control weeds in an environmentally sound manner.

Field studies were conducted in transgenic cotton (*Gossypium hirsutum* L.) in 1995 at Alexandria and St. Joseph, LA to compare Roundup (glyphosate) postemergence at 1 qt product/A (applied once or twice) to commercial treatments. Plots were four rows wide with the center two rows treated. Commercial standards were applied at labeled rates for soil types or weed sizes. Induce was added to Roundup mixtures at 0.5% v/v.

At Alexandria treatments were applied in 10 GPA. Soil conditions varied from wet to dry during the growing season. At this location Roundup was applied only once to Cotton that was 5 in at the 4 leaf stage alone or following Cotoran (fluometuron) preemergence, Treflan (trifluralin) preplant incorporated, or Cotoran plus Treflan. These treatments were compared with preemergence herbicides followed by the postemergence herbicide Staple (pyrithiobac) or postemergence directed herbicides at one and three applications. Roundup was applied to entireleaf morningglory (*Ipomoea hederacea* var. *integriuscula* Gray) that was 4 to 6 in with 4 to 6 leaves, hophornbeam copperleaf (*Acalypha ostryifolia* Riddell) 2 to 4 in with 2 to 4 leaves, and barnyardgrass [*Echinochloa crus-galli* (L.) Beauv.] 4 in with 4 leaves. Roundup was applied 3 wk following planting.

At St. Joseph treatments were applied in 15 GPA and soil conditions were dry during the growing season. Roundup was applied once or twice either alone or following preemergence herbicides. The first application timing was 2 wk after planting and the second was 2 wk later. Pitted morningglory (*Ipomoea lacunosa*) was 1 to 3 in with 2 to 5 leaves at the first timing and vining at the second timing. Prickly sida (*Sida spinosa* L.) was 2 to 4 in with 2 to 4 leaves at the first timing and 6 to 8 in with 8 leaves at the second timing. Common cocklebur (*Xanthium strumarium* L.) was 2 to 4 in and 2 to 9 in at the first and second

timing, respectively. Hemp sesbania [*Sesbania exaltata* (Raf.) ex A. W. Hill] was 1 to 2 in and 2 to 6 in at the first and second timing, respectively.

At Alexandria Cotoran followed by Roundup controlled entireleaf morningglory, hophornbeam copperleaf, and barnyardgrass 95 to 100% when rated at harvest. Roundup following Treflan or Treflan plus Cotoran exhibited similar results. Although Roundup following no preemergence herbicide resulted in excellent weed control, yields were lower than treatments with soil-applied herbicides. This could be attributed to the delayed application allowing weeds to compete with cotton. No cotton injury was detected with Roundup treatments.

At St. Joseph Cotoran followed by one application of Roundup controlled pitted morningglory, prickly sida, and common cocklebur 90 to 95% when rated 4 wk after treatment. Roundup controlled common cocklebur better than either Treflan or Cotoran followed by Staple and similar control to Treflan plus Cotoran plus two applications postemergence directed. Weed control with Roundup applied once or twice showed similar results with or without soil-applied herbicides. No cotton injury was detected with Roundup treatments and yields were similar with treatments that contained Roundup and better than Treflan plus Staple.

The use of Roundup postemergence on transgenic cotton in a weed management program offers the potential for controlling a broad spectrum of weeds such as pitted and entireleaf morningglory, prickly sida, common cocklebur, hemp sesbania, hophornbeam copperleaf, and barnyardgrass.

Roundup is also effective in controlling weeds at various growth stages, however delaying applications too long can result in weed competition to cotton that could reduce yields. Although Roundup has shown excellent results when applied either alone or following soil-applied herbicides, caution should be exercised when omitting preemergence herbicides since adverse weather conditions may prevent timely postemergence applications.