# PERENNIAL WEED CONTROL IN ROUNDUP READY™ COTTON

**J.M. Chandler and E.P. Prostko**
**Texas Agricultural Experiment Station**
**College Station, TX**
**L.D. Bradshaw**
**Monsanto Company**
**Houston, TX**

## Abstract

In Central Texas both annual and perennial morningglory species infest most cotton fields. The predominant annual species include pitted morningglory, entireleaf morningglory and ivyleaf morningglory. Sharppod morningglory is the predominant perennial species and accounts for approximately 60% of the morningglory population. Johnsongrass with its perennial growth habit still ranks among the most common and troublesome weeds infesting cotton. The adoption of conservation tillage systems for the production of cotton in Texas will greatly aid in the persistence of perennial weed species such as sharppod morningglory and johnsongrass. In 1995 field experiments were conducted in the Brazos bottom near College Station, Texas to determine the level of perennial sharppod morningglory and johnsongrass control with Roundup in Roundup Ready cotton. The sites were disked, chisel-plowed and bedded in October, 1994. The sharppod morningglory study was conducted on a Roetex clay soil as a factorial in a randomized block design with four replications. Conventional cropping techniques were used through the production season. The sharppod morningglory population was a natural infestation of perennial and annual plants. Treflan at 0.75 lb ai/A was broadcast on the beds and incorporated with a rolling cultivar 19 days prior to planting. At planting Caparol at 1.0 lb ai/A was applied. Roundup at 0.56, 0.75 and 1.12 lb ae/A was applied broadcast over-the-top when the cotton was in the 2 true leaf (2L) and 4 true leaf (4L) stages. The sharppod morningglories had four inch runners with ten leaves per plant. Additional postemergence directed (PDR) applications of Roundup at 0.56 lb ae/A were made in cotton with 9 (PDR9) or 11 (PDR11) true leaves. The morningglories were mainly seedlings with 4 to 6 true leaves. The johnsongrass study was conducted in a split-plot design with four replications on a Burco clay. Main plots were Prowl at 0.75 lb ai/A applied broadcast to the beds and incorporated with a rolling cultivator on February 24. The beds were rolled and a stale seed bed system established. The sub-plots included nine control systems using Roundup and/or Gramoxone applied at various crop growth stages. At planting, seedling and rhizome johnsongrass ranged in height from 1 to 24 inches. A preemergence broadcast application of Caparol at 1.0 lb ai/A was made into the existing vegetation. Roundup at 0.56 or 0.75 lb ae/A and Gramoxone at 0.625 lb ai/A were applied broadcast over-the-top at planting (PLNT) to selected control systems. Additional broadcast over-the-top applications of Roundup at 0.37 and 0.56 lb ae/A were applied when the cotton was in the 4 to 5 true leaf (4-5L) stage. Depending on prior treatments, johnsongrass stages ranged from 2 inch seedlings to rhizome plants 29 inches tall and in the boot stage. Additional postemergence directed applications of Roundup at 0.56 lb ae/A were made in cotton with 7 (PDR7) or 13 (PDR13) true leaves. The johnsongrass was mainly seedlings 4 to 5 inches tall.

Roundup at 0.56 and 0.75 lb/A applied to sharppod morningglory when the cotton was in the 2L stage provided 78 and 82% control 15 days after treatment (DAT) but only 43 and 49% control 84 DAT, respectively. Roundup at 0.56, 0.75 and 1.12 lb/A applied to sharppod morningglory when the cotton was in the 4L stage provided 40, 82 and 88% control 7 DAT and 90, 93 and 65% control 78 DAT, respectively. The initial control with the low rate was slow but provided excellent season-long control. The high rate apparently caused rapid top kill with reduced translocation to the roots resulting in poor perennial control by 78 DAT. Morningglory control ratings in August prior to harvest showed that Roundup at 0.56 lb/A applied when the cotton was in the 2L stage was poor (43%). An additional application at the PDR9 or PDR11 stages of Roundup at 0.75 lb/A provided 83% and 66% control, respectively. Roundup 0.56 lb/A at the 2L cotton stage followed by Roundup plus Bladex plus MSMA at 0.56 plus 0.8 plus 2.0 lb/A at PDR9 cotton stage provided 66% sharppod morningglory control.

All Roundup and Gramoxone treatments at planting provided 95% or greater visual johnsongrass burndown at 2 weeks after planting (WAP). By 4 WAP Roundup at 0.56 lb/A and Gramoxone at 0.63 lb/A provided 91 and 40% control of rhizome johnsongrass, respectively, with no seedling control due to newly emerged seedlings. Roundup and Gramoxone applied at PLNT followed by Roundup at 4-5L stage provided 99% control 5 WAP while PLNT applications alone provided 36 and 13% control, respectively. Applications of Prowl in February and Roundup or Gramoxone at PLNT plus Roundup at 4-5L stage provided 93% or greater johnsongrass control at 8 and 16 WAP. Roundup at 0.75 lb/A applied at PLNT followed by Roundup at 0.56 lb/A applied at the PDR7 stage provided only 65% control by 16 WAP. The application of Prowl prior to the Gramoxone at PLNT and Roundup at 4-5L (93% control) increased johnsongrass control compared to the same treatment without Prowl (65% control). However, an additional application of Roundup at PDR13 increased the 65% control to 98%.

No visual cotton injury was observed in any control system for sharppod morningglory and johnsongrass. Seed cotton yields reflected the degree of johnsongrass control obtained 16 WAP with the specific control systems. Application of Roundup at the 4-5L cotton stage was essential for obtaining maximum cotton yields.

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