

WEED CONTROL IN ROUNDUP READY™ COTTON

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Abstract

Five field experiments were conducted over 2 years (1995 and 1996) at two locations to evaluate the need for soil-applied residual herbicides in weed management programs for Roundup Ready™ cotton. At four of the five locations, adequate early-season weed control was achieved with single or sequential postemergence applications of Roundup (glyphosate) with Prowl (pendimethilin) preplant-incorporated (PPI) @ 0.75 lb ai/ac or Cotoran (fluometuron) applied preemergence (PRE) @ 1.2 lb ai/ac. Seed cotton yields were higher when soil-applied herbicides were included. At another location, adequate weed control and maximum cotton yields was attained with a single postemergence application of Roundup Ultra with no soil-applied herbicide. This was attributed to low weed seed germination during the season due to drought conditions.

Introduction

Roundup Ready™ technology offers new techniques for weed management in cotton. The role that soil-applied herbicides will function in this new technology needs to be evaluated as weed scientists and growers try to maximize cotton yield while reducing herbicide input costs.

Materials and Methods

Five field experiments were conducted over two years at the Edisto Research and Education Center in Blackville, South Carolina and an on-farm site in Saluda County, to evaluate the need for soil-applied herbicides in Roundup Ready™ cotton. All experiments were arranged in a randomized complete-block design. Soil-applied herbicide treatments were none (untreated), combinations of Treflan PPI @ 0.75 lb ai/ac, Prowl PPI @ 0.75 lb ai/ac, or Zorial (norflurazon) PPI @ 1.0 lb ai/ac with or without Zorial preemergence (PRE) @ 1.5 lb ai/ac or Cotoran PRE @ 1.2 or 2.0 lb ai/ac. Soil-applied herbicides were applied with or without the following postemergence over-the-top (POST) herbicides: Roundup (1995, applied with 0.05% v/v Induce)/Roundup Ultra (1996) POST @ 0.75 or 1.0 lb ai/ac or Staple (applied with 0.25% v/v Induce) POST @ 0.063 lb ai/ac. Additional herbicide treatments were Cotoran (1.0 lb ai/ac) + MSMA (2.0 lb ai/ac) early postemergence directed-spray (EPD), Bladex (cyanazine) (0.8 lb ai/ac) + MSMA (2.0 lb ai/ac) late postemergence-directed (LPD), or Cotton-Pro (prometryn) (0.5 lb ai/ac) + MSMA (2.0 lb ai/ac) LPD. Control of Palmer amaranth (Amaranthus palmeri), tropic croton

(Croton glandulosus var. septentrionalis), carpetweed (Mollugo verticillata), southern crabgrass (Digitaria ciliaris), common lambsquarters (Chenopodium album), coffee senna (Cassia occidentalis), ivyleaf morningglory (Ipomoea hederacea), common cocklebur (Xanthium strumarium), sicklepod (Senna obtusifolia), and yellow nutsedge (Cyperus esculentus) were evaluated.

Results and Discussion

At one location, averaged across years, Roundup alone at 1.0 lb ai/ac controlled Palmer amaranth and sicklepod 88 and 92% 8 weeks after planting (WAP), respectively. The inclusion of Prowl PPI and/or Cotoran PRE did not improve control. Treatments that included Roundup provided better control of Palmer amaranth than standard treatments. However, cotton achieved greater yields with than without soil-applied herbicides. At another location, sequential POST applications of Roundup at 0.75 lb ai/ac controlled Palmer amaranth, sicklepod, coffee senna, and common cocklebur similarly with and without soil-applied herbicides. However, two POST applications of Roundup were necessary. Cotoran applied PRE followed by Roundup increased ivyleaf morningglory control compared to Roundup alone. At this location, late-season control of all weed species was unacceptable without the inclusion of Prowl PPI and Cotoran PRE in the weed management program. This was attributed to continuous emergence of broadleaf weeds throughout the growing season.

At one location in 1996, a single POST application of Roundup Ultra provided excellent season-long control of Palmer amaranth, tropic croton, carpetweed, southern crabgrass, and common lambsquarters. Cotton yields were similar with one POST application of Roundup Ultra compared to systems that included Treflan PPI and/or Cotoran PRE. This was attributed to the lack of continuous weed emergence throughout the growing season due to drought conditions that occurred 2 to 8 WAP. Over the 2 years, at most locations soil-applied herbicides improved season-long weed control and resulted in greater cotton yields compared to single or sequential applications of Roundup alone.