

ANNUAL AND PERENNIAL MORNINGGLORY CONTROL IN HERBICIDE TOLERANT COTTON

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Abstract

Roundup (*glyphosate*) applied over-the-top of cotton up to the 4th leaf stage followed by one or two post directed applications have provided effective control of both field bindweed and annual morningglory. Post directed applications of Shark (*carfentrazone*) has provided 100 percent control of annual morningglory.

Introduction

Both annual morningglory (*Ipomoea hederacea*) and field bindweed (*Convolvulus arvensis*) are widespread, persistent and hard to control weeds in cotton grown in the San Joaquin Valley of California. Previous weed management and production systems have not provided satisfactory control of either weed species. Poor control has resulted in increased cultivation and hand weeding cost, and reduced harvest efficiencies and reductions in lint yield and quality.

Materials and Methods

Field studies were conducted in 2000 and 2001 to evaluate the control of annual morningglory and field bindweed in Roundup Ready Riata and BXN Nova cotton. Uniform fields of cotton, infested with one or the other of these species, were divided into treatments and replicated four times in a randomized complete block design. Initial herbicide applications were applied early over the top of cotyledon to 2 to 4-leaf cotton when weeds were small seedlings with followup treatments applied post directed at various stages of cotton and weed growth. Applications of non selective herbicides were applied as later post directed treatments to minimize cotton injury.

Results

Field Bindweed Control

Three applications of Roundup (*glyphosate*) at 1 lb. ai/A, with the first application being applied over-the-top of one (1) true leaf cotton to field bindweed with up to 18 inch stolons, provided season long control (99 percent control at harvest). Additions of Caparol (*prometryn*), Prowl (*pendimethalin*), Dual (*metolachlor*), Goal (*oxyfluorfen*), or Shark (*carfentrazone*) at the third application, when the cotton was 13 nodes between 22 and 26 inches tall and field bindweed 8 to 24 inch stolons, did not provide greater control than Roundup alone. Roundup applied in combination with Staple, either at two or three applications also provided no better control than Roundup alone. Treatments that included Staple (*pyrithiobac*), Shark and Caparol exhibited slight cotton injury, which subsequently disappeared producing no long term effect. All herbicide treatments exhibited greater statistically significant seed cotton yields than the untreated control.

In a second study conducted in 2001, post directed treatments of Shark alone and in tank mix combination with either Buctril (*bromoxynil*), Staple (*pyrithiobac*) or MSMA provided 70 to 86 percent burndown of field bindweed 7 days after treatment. An evaluation 7 days later at 14 DAT indicated regrowth of field bindweed, reducing burndown and control by 50 percent.

Annual Morningglory

Roundup applied over the top of Roundup Ready Riata cotton in the 3 to 4-leaf stage, when annual morningglory was 1 to 4 inches tall, followed by one or two directed applications of Roundup at later stages of cotton growth provided 100 percent control of annual morningglory. There were no differences in control between two and three applications of Roundup or applications at either the 6 or 8-leaf stage of cotton at the second application. Roundup applied over the top of cotton at the 2 and 4-leaf stage followed by post direct application at the 6, 8 and 12-leaf stage exhibited no injury symptoms.

Post directed applications of Shark, up to 1 oz./A, when Nova cotton was 18 - 24 inches tall, with morningglory at 12 to 18 inch shoots provided 100 percent control at 21 DAT. There was no advantage in tank mixing either Buctril, MSMA or Staple with Shark. At 7 DAT cotton injury ranged from 15 - 20 percent, but only 2 to 4 percent at 21 DAT.