

**MANAGING TROPICAL SPIDERWORT (*COMMELINA BENGHALENSIS*)
IN ROUNDUP READY COTTON**

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Abstract

Roundup Ready cotton has been readily accepted by growers, and it is now planted on 82% of Georgia's acreage. Most growers have adopted this technology due to convenience, reduced labor inputs, and shifts to conservation tillage practices. Many times a dinitroaniline herbicide is the only herbicide besides glyphosate (Roundup, others) used in these production systems. With this high dependence on Roundup Ready technology and glyphosate, tropical spiderwort has emerged as a major weed problem in many areas of Georgia.

Two field experiments were conducted in Grady County, GA during 2001 to compare glyphosate combinations applied topically to 4- to 5-leaf Roundup Ready cotton for postemergence tropical spiderwort control, residual tropical spiderwort control, and crop injury. Additionally, these studies compared herbicide systems with topical and directed applications (14-leaf cotton) for tropical spiderwort control. The experimental design was a split plot with treatments replicated three or four times. All treatments were applied at 14.8 GPA, and tropical spiderwort infestations were severe with 30 to 90 plants per square yard. Cultivars included DP 458 B/RR or Sure-Grow 521RR planted in May. Prowl (pendimethalin) was applied preemergence on each trial. Visual estimates of weed control were taken throughout the growing season.

At location one, the tropical spiderwort was 2 to 4 inches in height at time of topical applications and 1 to 5 inches at time of directed applications. Whole-plot options included four topical applications, including Roundup UltraMax (glyphosate) 1.2 pt/A alone or mixed with Staple (pyrithiobac) 0.6 oz/A, MSMA 1 pt/A, or Dual Magnum (*S*-metolachlor) 1 pt/A. Subplot options included the following nine directed applications: UltraMax 1.6 pt/A alone or mixed with Direx (diuron) 1.25 pt/A, Valor (flumioxazin) 1oz/A, Aim (carfentrazone) 0.5 oz/A, or Harvade (dimethipin) 8 oz/A plus crop oil concentrate 1 pt/A; and MSMA 2.67 pt/A alone or mixed with Direx 2 pt/A, Valor 2 oz/A, or Direx 2 pt/A plus Dual Magnum 1 pt/A. A nonionic surfactant was included with all MSMA treatments.

At 3 weeks after topical applications and prior to directed applications, UltraMax controlled tropical spiderwort 25%. Mixing Staple or Dual Magnum with UltraMax improved control 12 and 27%, respectively. MSMA mixed with UltraMax did not increase control. By mid-season, main effects were significant. Pooled across directed treatments, benefits from adding Staple or Dual with UltraMax were still noted.

Pooled over topical applications, UltraMax controlled tropical spiderwort 50% at mid-season. MSMA was 19% more effective than UltraMax. MSMA plus Valor or MSMA plus Direx plus Dual Magnum were 9% more effective than MSMA alone. By the end of the season, control by most herbicide systems dropped to less than 60%. The five systems that provided the greatest control (67 to 73%) were UltraMax plus Staple topical followed by UltraMax plus Valor directed; UltraMax plus Staple topical followed by MSMA plus Valor directed; UltraMax plus Staple topical followed by MSMA plus Direx plus Dual Magnum directed; UltraMax plus Dual Magnum topical followed by UltraMax plus Direx directed; and UltraMax plus Dual Magnum topical followed by MSMA directed.

At the second location, tropical spiderwort had not emerged when topical applications were made. Within 5 days of topical applications, 1" of rainfall was received and spiderwort emergence occurred. Whole-plot options included the following: UltraMax at 1.2 pt/A alone or mixed with Staple 0.6 oz/A, CGA 362622 0.1 oz/A, or Dual Magnum 1 pt/A. Subplot options included the following eight treatments applied as directed sprays: UltraMax 1.6 pt/A alone or mixed with Direx 1.25 pt/A, Valor 1 oz/A, Aim 0.5 oz/A, or Harvade 8 oz/A; and MSMA 2.67 pt/A alone or mixed with Valor 1 oz/A or Direx 2 pt/A. A crop oil concentrate was included with Harvade and all MSMA treatments.

At 5 days after topical applications, UltraMax mixed with Staple, CGA 362622, or Dual Magnum injured cotton 21, 35 and 5%, respectively. At 12 days, injury had decreased to 5, 13, and 1%, respectively. Injury was not detectable by 3 weeks after application.

UltraMax mixed with Staple, CGA 362622, or Dual Magnum controlled tropical spiderwort 18, 10 and 91%, respectively, at 2 weeks after application. By 4 weeks, residual control had increased to 45, 30 and 94%, respectively. Main effect means were significant late in the season. Pooled across layby treatments, UltraMax alone, UltraMax plus Staple, UltraMax plus CGA 362622, and UltraMax plus Dual Magnum controlled tropical spiderwort 58, 57, 50, and 92%, respectively.

Pooled over topical applications, the greatest initial control following directed applications was noted with MSMA plus Valor or UltraMax plus Valor (89 to 92%). However, late-season control was less than 75% due to continued weed emergence. Greater than 84% late-season control was noted only in systems containing UltraMax plus Dual Magnum applied topical. Other systems giving control comparable to Dual Magnum systems without a directed application were Roundup UltraMax topical followed by either MSMA or Valor plus MSMA directed (76 to 77% control) and UltraMax mixed with Staple topical followed by Valor plus MSMA directed (79% control).