

**NUTSEDGE (*CYPERUS* SPP.) MANAGEMENT
IN ARIZONA USING ROUNDUP-ULTRA
IN ROUNDUP READY COTTON**

**William B. McCloskey
University of Arizona
Tucson, AZ**

Abstract

The efficacy of glyphosate (Roundup-Ultra® herbicide) for the control of purple and yellow nutsedge (*Cyperus rotundus* and *C. esculentus*, respectively) in Roundup Ready® cotton was evaluated in field studies conducted at the University of Arizona Maricopa Agricultural Center in 1995 and 1996. The experimental design used for the nutsedge studies was a randomized complete block design with five (1995) or 6 (1996) blocks in which individual plots were four 40 inch rows by 40 feet long. The soil at the field study site was a Trix clay loam that contained 1.4 percent organic matter, 42 percent sand, 24 percent silt, and 34 percent clay. Prowl (pendimethalin) or a tank-mix of Prowl and Zorial (norflurazon) were applied to flat ground and incorporated with a spring tooth harrow consisting of three ranks of spring steel teeth a few weeks before planting (see data tables for rates in lb of active ingredient per acre). The fields were listed and the large peaked beds were rotomulched. The seed beds were mulched a second time using a Sidewinder rotomulcher and then shaped with a bed shaper. Roundup Ready cotton seed was planted about 0.5 inches deep in dry soil on April 18, 1995 and April 25, 1996 and then were irrigated to initiate germination. Postemergence herbicide treatments were applied to the plots with tractor mounted equipment, either a gasoline motor driven roller pump sprayer, or a compressed air plot sprayer. See data table for herbicide treatment rates (lb a.i./A), application dates, cotton growth stage at the time of each application, and the dates weed control efficacy data was collected. In 1995, a special formulation of Roundup herbicide (MON 2139) that contained glyphosate without surfactant was used and 0.05 percent (v/v) of a non-ionic surfactant (MON 0818) was separately added to the spray solutions. In 1996, Roundup-Ultra was used without additional surfactants. Standard University of Arizona cotton production and insect control recommendations were followed to produce the cotton crop. The center two rows of the four row plots were machine harvested on October 17, 1995 and November 1, 1996. Analysis of variance and mean separation with Duncan's multiple range test were used to elucidate differences between treatments.

Two sequential applications of Roundup-Ultra at a rate of 1 qt/A in Roundup Ready cotton provided effective suppression of purple and yellow nutsedge that maximized yield (Table 4 and 5). Note that all treatments, including

treatment 1, received a preplant incorporated application of Prowl at 0.75 lb a.i./A, and were free of weeds with the exception of purple and yellow nutsedge. Cotton yield were substantially lower in 1996 compared to 1995 due to the latter planting date and high night-time temperatures during most of the primary fruiting cycle. The two sequential Roundup-Ultra applications provided superior nutsedge suppression compared with two applications or organic arsenical herbicides (i.e., DSMA followed by MSMA). Zorial applied preplant-incorporated suppressed nutsedge early in the season but did not result in better control or yield than two sequential applications of Roundup-Ultra. Thus, there appears to be little benefit in using Zorial in Roundup Ready cotton for nutsedge control.

Table 4. The control of purple and yellow nutsedge in Roundup Ready Cotton in 1995. All treatments received a preplant incorporated application of Prowl at 0.75 lb a.i./A to control grass and small seeded broadleaf weeds.

Year	Treatment	Rate	Cotton Growth Stage	Nutsedge Control 1 st appl.	Nutsedge Control 2 nd appl.	Lint Yield
		lb a.i./A		%	%	lb/A
1.	untreated			0 e ^a	0 c	1331 cd
2.	Roundup	1.0	1-2 lf	47 cd	94 a	1358 bcd
	Roundup	1.0	4-5 lf			
3.	DSMA	2.7	1-2 lf	32 d	57 b	1254 d
	MSMA	2.0	8 node			
4.	Zorial	0.64	PPI	63 ab	64 b	1278 d
5.	Zorial	0.64	PPI	77 a	90 a	1515 ab
	Roundup	1.0	1-2 lf			
	Roundup	1.0	4-5 lf			

^aMeans within columns followed by the same letter are significantly different (P=0.05) according to Duncan's multiple range test).

Table 5. The control of purple and yellow nutsedge in Roundup Ready Cotton in 1996. All treatments received a preplant incorporated application of Prowl at 0.75 lb a.i./A to control grass and small seeded broadleaf weeds.

Year	Treatment	Rate	Cotton Growth Stage	Nutsedge Control 1 st appl.	Nutsedge Control 2 nd appl.	Seed Cotton Yield
		lb a.i./A		%	%	lb/A
1.	untreated			0 e ^a	0 c	826 c
2.	Roundup	1.0	1-2 lf	59 a	93 a	1802 ab
	Roundup	1.0	4-5 lf			
3.	DSMA	2.7	1-2 lf	42 bcd	45 b	1507 bc
	MSMA	2.0	6 node			
4.	Zorial	0.64	PPI	42 bcd	5 d	832 c
5.	Zorial	0.64	PPI	59 a	92 a	1692 ab
	Roundup	1.0	1-2 lf			
	Roundup	1.0	4-5 lf			
6.	Zorial	0.64	PPI	34 d	67 b	1075 bc
	DSMA	1.0	1-2 lf			
	MSMA	1.0	4-5 lf			

^aMeans within columns followed by the same letter are significantly different (P=0.05) according to Duncan's multiple range test).