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Herbicide Evaluation in Arkansas Cotton 2000

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HERBICIDE EVALUATION IN ARKANSAS COTTON, 2000

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HERBICIDE EVALUATION IN ARKANSAS COTTON, 2000

Marilyn McClelland, Jim Barrentine, Ken Smith, and Nilda Burgos

INTRODUCTION

Herbicidal weed control is economically important for production of cotton. Field experiments are conducted annually in Arkansas to evaluate the activity of developmental and commercial herbicides for selective control of weeds in cotton. These experiments serve both industry and Arkansas agriculture by providing information on the selectivity of herbicides still in the developmental stage and by comparing the activity of these new herbicides with that of recommended herbicides.

The research reported herein is a compilation of data from experiments conducted by four of the state's agronomic researchers responsible for weed control in cotton. Jim Barrentine, Marilyn McClelland, and Nilda Burgos are located at the Main Experiment Station, Fayetteville, and conduct research at Fayetteville and

at the Cotton Branch Experiment Station, Marianna. Ken Smith is located at the Southeast Research and Extension Center in Monticello and conducts research at the Southeast Branch Experiment Station at Rohwer.

Common names of the herbicides presented in data tables are referenced to trade names and sponsoring companies in Appendix Tables 1 and 2. The scientific names of the plants evaluated and their associated Bayer codes are listed in Appendix Table 3. Climatological data for 2000 are presented in Appendix Tables 4, 5, and 6.

METHODS

Pertinent information specific to each field test precedes each data table. Included is information on general field conditions, field maintenance, and herbicide application and general conclusions from the data. Test

areas were fertilized as recommended from soil tests. Weed densities were taken in most experiments and are presented in each table. Densities, expressed as no./ft² or no./m², are natural populations or from populations broadcast-seeded.

The herbicides used in these studies are designated in the tables by the common name proposed to or accepted by the Weed Science Society of America or, when common names are unavailable, by code number designation. A trade name is specified in parentheses at first use in each table. Herbicides formulated as pre-packaged mixtures are listed in tables by their component herbicides in parentheses. All herbicide rates are expressed in pounds of active ingredient per acre (lb/A) on a broadcast basis unless otherwise specified. Adjuvant rates are expressed as percent volume/volume.

Effects of the herbicide treatments were evaluated by weed control ratings, crop injury ratings, and crop yields. Percentages of weed control and crop injury were visually estimated: 0% represents no effect, and 100% represents complete kill. Cotton yield is reported as lb/A and is specified as seedcotton or lint yield. Data were subjected to analysis of variance with untreated check plots included in analyses, and Fisher's protected Least Significant Difference (LSD) test at the 5% level of significance was used for separation of means.

ABBREVIATIONS OF TERMS

The following abbreviations are used in tables:

A = acre
 ae = acid equivalent
 ai = active ingredient
 BkPkCO₂ = CO₂ backpack sprayer

BR = Bollgard/Roundup Ready® stacked gene cultivar
 BXN = Buctril-resistant cultivar
 Cot. = cotyledon
 DAT = days after treatment
 EDIR = early post-directed
 EOT = early over-the-top (same as EPOST)
 EPOST = early postemergence
fb = followed by
 FF = flat fan nozzle
 GP = Glyphomax Plus (glyphosate formulation)
 Gpa = gallons per acre
 hvy. = heavy (weed population)
 LDIR = late post-directed
 lf = leaf
 LOT = late over-the-top (same as LPOST)
 LPOST = late postemergence
 LSD = least significant difference
 mod. = moderate (weed population)
 N/A = not applicable or not available
 NAWF = nodes above white flower
 Noz = nozzles
 NS = not significant
 OC = off-center nozzle
 OT = over-the-top
 POST = postemergence
 PPI = preplant incorporated
 PPL = preplant (not incorporated)
 PRE = preemergence
 RCB = randomized complete block (experimental design)
 RR = Roundup Ready® (glyphosate-resistant cultivar)
 RU = Roundup Ultra (glyphosate formulation)
 UNR = ultra-narrow row
 XR = extended range nozzle

Table 1. Benefits of pyriithiobac (Staple) in Roundup Ready (glyphosate-tolerant) cotton, Fayetteville, 2000.

TEST INFORMATION

Location	Fayetteville	Crop / Cultivar	cotton / DPL 451BR
Experimental design / replications	RCB / 4	Seeding rate	4 / ft
Plot size	3.3 ft x 27 ft	Planting date / Harvest date	May 22, 2000 / N/A
Row width / Number of rows per plot	40 inches / 1	Soil type	Taloka silt loam (21 sand, 68% silt, 11% clay)
		% OM / pH	1.1 / 5.7

Comments: Each plot is 12 ft weedy and 12 ft weedfree with 3-ft alleys. PRE = preemergence; EOT = early over-the-top (1-lf, 3-inch cotton); and LOT = late over-the-top (4-lf, 6- to 7-inch cotton). Weed size for LOT from plots treated with pyriithiobac PRE. Glyphosate is original formulation without surfactant (Roundup) except where noted as RU (Roundup Ultra) and is used to simulate the premix formulation of pyriithiobac + glyphosate, which will be called Staple Plus. Herbicide information can be found in Appendix Table 1.

Application

Type	PRE	EOT	LOT
Date applied	May 22, 2000	June 6, 2000	June 22, 2000
Time	6:30 pm	4:00 pm	5:00 pm
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	77 / 77	79 / 84	88 / 89
Relative humidity (%)	80	65	75
Wind (mph)	4	2	2
Cloud cover (%)	20	0	0
Soil moisture	moist	moist	wet
Crop stage/height	N/A	1 lf / 2.5-3 in.	4 lf / 6-7 in.
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/size	Flat fan / XR8002VS	Flat Fan / XR8002VS	Flat fan / XR8002VS
Boom ht / # noz / spacing (in.)	20 / 2 / 18	21 / 2 / 18	26 / 2 / 18
Gpa / Psi	15 / 24	15 / 26	15 / 25
Weed species (density)	-----[no. of leaves / height (cm.)]-----		
DIGSA* (3/ft ²)		1-2 lf / >1 cm	2-7 lf / 5 cm
AMACH (1/ft ²)		cot.-2 lf / 0.5-1 cm	not present
AMAPA (1/ft ²)		cot - 2 lf / 0.5 cm	not present
IPOLA (4/ft ²)		1-2 lf / 3 cm	2-8 lf / 4-6 cm
SEBEX (4/ft ²)		1-2 compd. / 2-3.5 cm	2-5 lf / 3-6 cm
ABUTH (3/ft ²)		2 lf / 2 cm	2-5 lf / 2-3 cm
SIDSP (2/ft ²)		1-2 lf / 0.5 cm	not present

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: Pyriithiobac PRE was quite active, so even pitted morningglory was controlled 78 to 85% and hemp sesbania was controlled 70 to 78% with 0.031 lb/A PRE. Control with pyriithiobac + fluometuron was 96%. The weakest treatment was a single application of pyriithiobac + glyphosate (Staple Plus) at 0.031 + 0.75 lb ai/A applied at 1-leaf cotton. Repeating the treatment at 2- to 4-leaf cotton, even if rates were reduced to 0.021 + 0.5 lb/A; applying at 2- to 4-leaf cotton only; or following the 1-leaf treatment with glyphosate alone at the 2- to 4-leaf stage increased control of pitted morningglory over control with the 1-leaf application. Some morningglory emerged after the 1-leaf application. In 1999, adding pyriithiobac to glyphosate increased control of most species over control with glyphosate alone. In 2000, however, activity with all herbicides was about equal.

Table 1. Section 1.

Herbicide	Rate (lb ai/A)	Application timing	Large crabgrass (DIGSA)				Smooth pigweed (AMACH)			
			6/20	7/5	7/26	8/9	6/20	7/5	7/26	8/9
			----- % -----							
Untreated check			0	0	0	0	0	0	0	0
Pyriithiobac (Staple) <i>fb</i>	0.031	PRE	68	100	99	99	100	100	100	100
pyriithiobac + AG-98 <i>fb</i>	0.063 0.25%	LOT								
quizalofop (Assure) + AG-98 <i>fb</i>	0.063 0.25%	EOT + 24 hr								
quizalofop + AG-98	0.063 0.25%	LOT + 24 hr								
Pyriithiobac + fluometuron (Cotoran)	0.031 0.94	PRE	100	100	100	100	100	100	100	100
<i>fb</i> pyriithiobac + AG-98 <i>fb</i>	0.063 0.25%	LOT								
quizalofop + AG-98 <i>fb</i>	0.063 0.25%	EOT + 24 hr								
quizalofop + AG-98	0.063 0.25%	LOT + 24 hr								
Pyriithiobac + fluometuron <i>fb</i>	0.031 0.94	PRE	100	100	100	100	100	100	100	100
pyriithiobac + glyphosate (RU) + AG-98	0.031 0.75 0.25%	LOT								
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.75 0.25%	EOT	100	100	98	96	100	100	100	100
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.75 0.25%	LOT	0	100	100	100	0	100	100	100
Pyriithiobac <i>fb</i> [pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.031 0.75 0.25%	PRE LOT	87	100	100	100	100	100	100	100
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98 <i>fb</i>	0.021 0.5 0.25%	EOT	100	100	100	100	100	100	100	100
[pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.021 0.5 0.25%	LOT								
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98 <i>fb</i> glyphosate (RU)	0.031 0.75 0.75	EOT LOT	100	100	100	100	100	100	100	100
Pyriithiobac <i>fb</i> glyphosate (RU)	0.031 0.75	PRE LOT	71	100	100	100	100	100	100	100
Glyphosate (RU) <i>fb</i> glyphosate (RU)	0.75 0.75	EOT LOT	100	100	98	99	100	100	100	100
LSD (0.05)			13	1	2	2	1	1	1	1

continued

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Table 1. Section 2.

Herbicide	Rate (lb ai/A)	Application timing	Palmer amaranth (AMAPA)				Pitted morningglory (IPOLA)			
			6/20	7/5	7/26	8/9	6/20	7/5	7/26	8/9
			----- % -----							
Untreated check			0	0	0	0	0	0	0	0
Pyriithiobac (Staple) <i>fb</i>	0.031	PRE	100	100	100	100	80	90	95	97
pyriithiobac + AG-98 <i>fb</i>	0.063 0.25%	LOT								
quizalofop (Assure) + AG-98 <i>fb</i>	0.063 0.25%	EOT + 24 hr								
quizalofop + AG-98	0.063 0.25%	LOT + 24 hr								
Pyriithiobac + fluometuron (Cotoran)	0.031 0.94	PRE	100	100	100	100	96	98	99	100
<i>fb</i> pyriithiobac + AG-98 <i>fb</i>	0.063 0.25%	LOT								
quizalofop + AG-98 <i>fb</i>	0.063 0.25%	EOT + 24 hr								
quizalofop + AG-98	0.063 0.25%	LOT + 24 hr								
Pyriithiobac + fluometuron <i>fb</i>	0.031 0.94	PRE	100	100	100	100	96	99	100	99
pyriithiobac + glyphosate (RU) + AG-98	0.031 0.75 0.25%	LOT								
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.75 0.25%	EOT	100	100	100	100	81	86	73	75
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.75 0.25%	LOT	0	100	100	100	0	76	95	94
Pyriithiobac <i>fb</i> [pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.031 0.75 0.25%	PRE LOT	100	100	100	100	85	96	97	100
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98 <i>fb</i>	0.021 0.5 0.25%	EOT	100	100	100	83	94	97	98	100
[pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.021 0.5 0.25%	LOT								
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98 <i>fb</i> glyphosate (RU)	0.031 0.75 0.75	EOT LOT	100	100	100	83	91	97	98	100
Pyriithiobac <i>fb</i> glyphosate (RU)	0.031 0.75	PRE LOT	100	100	100	100	78	95	94	95
Glyphosate (RU) <i>fb</i> glyphosate (RU)	0.75 0.75	EOT LOT	100	100	100	100	79	89	93	95
LSD (0.05)			1	1	1	1	7	5	6	6

continued

Table 1. Section 3.

Herbicide	Rate (lb ai/A)	Application timing	Hemp sesbania (SEBEX)				Prickly sida (SIDSP)			
			6/20	7/5	7/26	8/9	6/20	7/5	7/26	8/9
			----- % -----							
Untreated check			0	0	0	0	0	0	0	0
Pyriithiobac (Staple) <i>fb</i>	0.031	PRE	70	100	100	100	100	99	100	100
pyriithiobac + AG-98 <i>fb</i>	0.063 0.25%	LOT								
quizalofop (Assure) + AG-98 <i>fb</i>	0.063 0.25%	EOT + 24 hr								
quizalofop + AG-98	0.063 0.25%	LOT + 24 hr								
Pyriithiobac + fluometuron (Cotoran)	0.031 0.94	PRE	99	100	100	100	100	100	100	100
<i>fb</i> pyriithiobac + AG-98 <i>fb</i>	0.063 0.25%	LOT								
quizalofop + AG-98 <i>fb</i>	0.063 0.25%	EOT + 24 hr								
quizalofop + AG-98	0.063 0.25%	LOT + 24 hr								
Pyriithiobac + fluometuron <i>fb</i>	0.031 0.94	PRE	98	100	100	100	100	100	100	100
pyriithiobac + glyphosate (RU) + AG-98	0.031 0.75 0.25%	LOT								
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.75 0.25%	EOT	100	98	100	98	100	99	100	100
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.75 0.25%	LOT	0	95	100	100	0	98	96	99
Pyriithiobac <i>fb</i> [pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.031 0.75 0.25%	PRE LOT	78	99	100	100	100	100	100	100
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98 <i>fb</i>	0.021 0.5 0.25%	EOT	100	100	100	100	100	100	100	100
[pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.021 0.5 0.25%	LOT								
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98 <i>fb</i> glyphosate (RU)	0.031 0.75 0.75	EOT LOT	100	100	100	100	100	100	100	100
Pyriithiobac <i>fb</i> glyphosate (RU)	0.031 0.75	PRE LOT	97	100	100	100	100	100	100	100
Glyphosate (RU) <i>fb</i> glyphosate (RU)	0.75 0.75	EOT LOT	99	99	99	99	100	100	100	100
LSD (0.05)			5	2	1	1	2	2	1	1

continued

Herbicide Evaluation in Arkansas Cotton, 2000

Table 1. Section 4.

Herbicide	Rate (lb ai/A)	Application timing	Velvetleaf (ABUTH)				Effect on cotton			
			6/20	7/5	7/26	8/9	6/20	7/5	7/26	8/9
			----- % -----							
Untreated check			0	0	0	0	0	0	0	0
Pyriithiobac (Staple) <i>fb</i>	0.031	PRE	100	100	100	100	4	10	0	0
pyriithiobac + AG-98 <i>fb</i>	0.063 0.25%	LOT								
quizalofop (Assure) + AG-98 <i>fb</i>	0.063 0.25%	EOT + 24 hr								
quizalofop + AG-98	0.063 0.25%	LOT + 24 hr								
Pyriithiobac + fluometuron (Cotoran)	0.031 0.94	PRE	99	100	100	100	5	10	0	0
<i>fb</i> pyriithiobac + AG-98 <i>fb</i>	0.063 0.25%	LOT								
quizalofop + AG-98 <i>fb</i>	0.063 0.25%	EOT + 24 hr								
quizalofop + AG-98	0.063 0.25%	LOT + 24 hr								
Pyriithiobac + fluometuron <i>fb</i>	0.031 0.94	PRE	100	100	100	100	4	5	0	0
pyriithiobac + glyphosate (RU) + AG-98	0.031 0.75 0.25%	LOT								
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.75 0.25%	EOT	100	100	100	100	0	1	0	0
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.75 0.25%	LOT	0	97	98	100	0	0	0	0
Pyriithiobac <i>fb</i> [pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.031 0.75 0.25%	PRE LOT	100 100	100 100	100 100	100 100	4 4	4 0	0 0	0 0
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98 <i>fb</i>	0.021 0.5 0.25%	EOT	100	100	100	100	0	0	0	0
[pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.021 0.5 0.25%	LOT								
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98 <i>fb</i> glyphosate (RU)	0.031 0.75 0.75	EOT LOT	100 100	100 100	100 100	100 100	1 4	0 8	0 0	0 0
Pyriithiobac <i>fb</i> glyphosate (RU)	0.031 0.75	PRE LOT	100 100	100 100	100 100	100 100	4 3	8 0	0 0	0 0
Glyphosate (RU) <i>fb</i> glyphosate (RU)	0.75 0.75	EOT LOT	100 100	100 100	100 100	100 100	3 3	0 0	0 0	0 0
LSD (0.05)			1	1	2	1	4	6	NS	NS

Table 2. Benefits of pyriithiobac (Staple) in Roundup Ready (glyphosate-tolerant) cotton, Marianna, 2000.**TEST INFORMATION**

Location	Marianna	Crop / Cultivar	cotton / DPL 451 BR
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 30 ft	Planting date / Harvest date	May 11, 2000 / Oct. 13, 2000
Row width / Number of rows per plot	38 in. / 4	Soil type	silt loam (2% sand, 86% silt, 12% clay)
		% OM / pH	1.1 / 5.7

Comments: PRE = preemergence; EOT = early over-the-top at cot.- to 1-leaf cotton; and LOT = late over-the-top at 3- to 4-leaf cotton. Glyphosate is original formulation without surfactant (Roundup) except where noted as RU (Roundup Ultra) and is used to simulate the premix formulation of pyriithiobac + glyphosate, which will be called Staple Plus. Herbicide information can be found in Appendix Table 1.

Application

Type	PRE	EOT	LOT
Date applied	May 12, 2000	May 30, 2000	June 7, 2000
Time	5:00 pm	4:30 pm	11:30 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	85 / 74	89 / 77	75 / 77
Wind (mph)	10	5	5
Cloud cover (%)	0	0	0
Soil moisture	adequate	adequate	adequate
Crop stage	N/A	cot. - 1-lf	3-4 lf
Sprayer type/mph	Tractor / 3.5	Tractor / 3.5	Tractor / 3.5
Nozzle type/size	Flat fan / 8003	Flat fan / 8003	Flat fan / 11003
Boom ht / # Noz / Spacing (in.)	19 / 2 / 19	19 / 2 / 19	16 / 2 / 19
Gpa / Psi	20 / 28	20 / 27	20 / 27
Weed species (density)	-----	(leaf number) -----	
SIDSP* (2/ft ²)		cot. - 2 lf	cot. - 4 lf
IPOLA (2/ft ²)		cot. - 4 lf	cot. - 5 lf
IPOHG (2/ft ²)		cot. - 4 lf	cot. - 5 lf
AMACH (4/ft ²)		cot. - 3 lf	cot. - 4 lf

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: Pyriithiobac at 0.031 lb/A added to glyphosate and applied at EOT (1-leaf cotton) or LOT (3-leaf cotton) generally increased weed control over two applications of glyphosate alone by 6 weeks after the LOT application. The exception was morningglory species, which were controlled better with LOT applications of pyriithiobac + glyphosate than with EOT applications. At 6 weeks after the LOT applications, control from the single EOT treatments was not different from two glyphosate applications. Even with those treatments, however, control was ⊕85%.

Table 2. Section 1.

Herbicide	Rate (lb/A)	Application timing	Pitted and entireleaf morningglory (IPOSS)					Prickly sida (SIDSP)					
			6/6	6/13	6/20	7/5	7/19	6/6	6/13	6/20	7/5	7/19	
Untreated			0	0	0	0	0	0	0	0	0	0	
Pyriithiobac + fluometuron <i>fb</i>	0.031 0.94	PRE	85	75	90	88	95	96	100	98	99	99	
pyriithiobac + quizalofop + AG-98	0.063 0.063 0.25%	LOT											
Pyriithiobac + fluometuron <i>fb</i>	0.031 0.94	PRE	80	73	96	93	96	98	100	97	100	100	
[pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.75 0.25%	LOT											
Pyriithiobac <i>fb</i> [pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.031 0.75 0.25%	PRE LOT	67	73	85	92	97	98	100	97	100	100	
[Pyriithiobac + glyphosate (Staple Plus)]+ AG-98	0.031 0.75 0.25%	EOT		77	87	88	87		100	90	97	100	
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.75 0.25%	LOT		53	77	92	93		60	92	98	98	
Pyriithiobac + glyphosate (RU)	0.031 0.75	EOT		80	88	82	85		100	96	98	98	
Glyphosate (RU) <i>fb</i> glyphosate (RU)	0.75 0.75	EOT LOT		75	85	83	85		100	87	70	88	
LSD (0.05)			15	8	5	7	6		5	10	7	6	5

continued

Table 2. Section 2.

Herbicide	Rate (lb/A)	Application timing	Palmer amaranth and smooth pigweed (AMASS)				Carpetweed (MOLVE)		
			6/13	6/20	7/5	7/19	6/20	7/5	7/19
Untreated			0	0	0	0	0	0	0
Pyriithiobac + fluometuron <i>fb</i>	0.031 0.94	PRE	98	98	93	90	100	100	100
pyriithiobac + quizalofop + AG-98	0.063 0.063 0.25%	LOT							
Pyriithiobac + fluometuron <i>fb</i>	0.031 0.94	PRE	100	100	100	97	100	100	100
[pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.75 0.25%	LOT							

continued

Table 2. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Palmer amaranth and smooth pigweed (AMASS)				Carpetweed (MOLVE)		
			6/13	6/20	7/5	7/19	6/20	7/5	7/19
Pyrithiobac <i>fb</i>	0.031	PRE	90	98	97	98	100	100	100
[pyrithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.75 0.25%	LOT							
[Pyrithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.75 0.25%	EOT	99	100	98	100	100	100	97
[Pyrithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.75 0.25%	LOT	100	100	97	97	100	100	100
Pyrithiobac + glyphosate (RU)	0.031 0.75	EOT	100	100	97	97	100	99	100
Glyphosate (RU) <i>fb</i> glyphosate (RU)	0.75 0.75	EOT LOT	100	100	90	92	100	77	85
LSD (0.05)			6	2	11	4	1	6	3

continued

Table 2. Section 3.

Herbicide	Rate (lb ai/A)	Application timing	Goosegrass and barnyard- grass (GGGAN)			Cotton injury				
			6/20	7/5	7/19	6/6	6/13	6/20	7/5	7/19
Untreated			0	0	0	0	0	0	0	0
Pyrithiobac + fluometuron <i>fb</i>	0.031 0.94	PRE	100	93	93	7	8	13	15	12
pyrithiobac + quizalofop + AG-98	0.063 0.063 0.25%	LOT								
Pyrithiobac + fluometuron <i>fb</i>	0.031 0.94	PRE	100	88	88	3	10	8	0	0
[pyrithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.75 0.25%	LOT								
Pyrithiobac <i>fb</i> [pyrithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.031 0.75 0.25%	PRE LOT	100	95	95	3	0	10	2	0
[Pyrithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.75 0.25%	EOT	100	88	90	0	0	0	0	0
[Pyrithiobac + glyphosate (Staple Plus)] + AG-98	0.031 0.75 0.25%	LOT	100	93	94		10	0	0	0
Pyrithiobac + glyphosate (RU)	0.031 0.75	EOT	100	88	93		0	0	0	0
Glyphosate (RU) <i>fb</i> glyphosate (RU)	0.75 0.75	EOT LOT	100	75	78		0	2	0	0
LSD (0.05)			1	10	10	NS	4	5	2	3

Table 3. Evaluation of pyriithiobac (Staple) and glyphosate (Roundup Ultra) mixtures, Rohwer, 2000.

TEST INFORMATION

Location	Rohwer	Crop / Cultivar	cotton / DP 451 B/RR
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 35 ft	Planting date / Harvest date	May 24, 2000 / N/A
Row width / Number of rows per plot	38 in. / 4	Soil type	silt loam (16% sand, 67% silt, 17% clay)
		% OM / pH	1.1 / 7.1

Comments: DPX-AEA46 is a pre-mix of pyriithiobac and glyphosate (Staple Plus). Treatments were applied over-the-top. Herbicide information can be found in Appendix Table 1.

Application

Type	EPOST
Date applied	June 13, 2000
Time	9:30 am
Incorporation equipment	N/A
Air/Soil temperature (F)	86 / 81
Relative humidity (%)	64
Wind (mph)	2
Cloud cover (%)	50
Soil moisture	dry
Crop stage/height	1-4 lf / 6"
Sprayer type/mph	BkPkCO ₂ / 3
Nozzle type/size	Flat fan / 8002VS
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19
Gpa / Psi	15 / 22
Weed species (density)	[height (in.)]
AMAPA* (light)	4"
IPLA (light)	4"
SIDSP (light)	4"
ECHCG (light)	4"

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: Pyriithiobac (Staple), pyriithiobac + glyphosate (Roundup Ultra), and DPX-AEA46 (Staple Plus) were applied early POST and evaluated for controlling redroot pigweed, pitted morningglory, prickly sida, and barnyardgrass. Pyriithiobac alone provided greater than 85% control of pigweed, but failed to provide adequate control of all other species evaluated. Glyphosate alone provided greater than 90% control of all species except for morningglory. When pyriithiobac and glyphosate were combined, control of all species was increased to greater than 85%. There were no differences in control observed between the tank mixture of pyriithiobac + glyphosate and the premix of pyriithiobac + glyphosate (DPX-AEA46, Staple Plus).

Table 3.

Herbicide	Rate (lb ai/A)	Application timing	Weed control			
			Redroot pigweed (AMARE)	Pitted morningglory (IPOLA)	Prickly sida (SIDSP)	Barnyardgrass (ECHCG)
			6/29	6/29	6/29	6/29
Untreated check			0	0	0	0
Pyrithiobac (Staple)	0.031	1-4 LF	93	68	50	53
Pyrithiobac + AG-98	0.031 0.125%	1-4 LF	93	77	66	33
Pyrithiobac + AG-98	0.031 0.25%	1-4 LF	99	85	75	25
Pyrithiobac + AG-98	0.031 0.5%	1-4 LF	85	85	83	13
Glyphosate (Roundup Ultra)	0.75	1-4 LF	99	56	95	96
Glyphosate + AG-98	0.75 0.125%	1-4 LF	100	65	93	96
Glyphosate + AG-98	0.75 0.25%	1-4 LF	100	65	95	99
Glyphosate + AG-98	0.75 0.5%	1-4 LF	100	53	90	99
Pyrithiobac + glyphosate	0.031 0.75	1-4 LF	100	89	100	99
Pyrithiobac + glyphosate + AG-98	0.031 0.75 0.125%	1-4 LF	100	76	100	97
Pyrithiobac + glyphosate + AG-98	0.031 0.75 0.25%	1-4 LF	100	86	100	99
Pyrithiobac + glyphosate + AG-98	0.031 0.75 0.5%	1-4 LF	100	86	100	95
DPX-AEA46 (Staple Plus)	0.78	1-4 LF	100	83	96	96
DPX-AEA46 (Staple Plus) + AG-98	0.78 0.125%	1-4 LF	100	93	98	96
DPX-AEA46 (Staple Plus) + AG-98	0.78 0.25%	1-4 LF	100	86	100	97
DPX-AEA46 (Staple Plus) + AG-98	0.78 0.5%	1-4 LF	100	81	100	98
LSD (0.05)			7	15	9	20

Table 4. Pyriithiobac (Staple) and glyphosate combinations applied PRE and POST, Rohwer, 2000.

TEST INFORMATION	
Location	Rohwer
Experimental design / replications	RCB / 4
Plot size	12.7 ft x 35 ft
Row width / Number of rows per plot	38 in. / 4
Crop / Cultivar	cotton / DP 451 B/RR
Seeding rate	12 lb/acre
Planting date / Harvest date	May 17, 2000 / Oct. 12, 2000
Soil type	silt loam (16% sand, 67% silt, 17% clay)
% OM / pH	1.1 / 7.1

Comments: PRE = preemergence; 1 LF = over-the-top at 1-leaf cotton; and 3-4 LF = over-the-top at 3- to 4-leaf cotton. Glyphosate is original formulation without surfactant (Roundup) except where noted as RU (Roundup Ultra) and is used to simulate the premix formulation of pyriithiobac + glyphosate, which will be called Staple Plus. Herbicide information can be found in Appendix Table 1.

Application

Type	PRE	1 LF	3-4 LF
Date applied	May 18, 2000	June 7, 2000	June 13, 2000
Time	8:00 am	7:30 am	10:30 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	75 / 70	84 / 76	86 / 81
Relative humidity (%)	73	44	64
Wind (mph)	8	2	5
Cloud cover (%)	80	20	0
Soil moisture	optimal	optimal	dry
Crop stage/height	N/A	1-1f / 2"	3-4 lf / 4"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/size	Flat fan / 8002VS	Flat fan / 8002VS	Flat fan / 8002VS
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19	22 / 8 / 19
Gpa / Psi	15 / 22	15 / 22	15 / 18
Weed species (density)	-----	[height (in.)] -----	
ECHCG* (mod.)		2"	3"
IPOLA (mod.)		2"	3"
SIDSP (mod.)		2"	3"
BRAPP (mod.)		2"	3"

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: Pyriithiobac (Staple) and fluometuron (Cotoran) were applied alone and in tank mixtures at PRE, 1-leaf, and 3- to 4-leaf cotton for control of barnyardgrass, broadleaf signalgrass, pitted morningglory, and prickly sida. Pyriithiobac applied PRE and at the 1-leaf stage followed by glyphosate and glyphosate or pyriithiobac + glyphosate at the 3- to 4-leaf stage provided greater than 90% control of all species, with little or no injury observed. Fluometuron and pyriithiobac combinations provided acceptable control of all species except pitted morningglory. When glyphosate was added to the fluometuron and pyriithiobac combination, control of all species was increased to greater than 95%.

Table 4. Section 1.

Herbicide	Rate (lb ai/A)	Application timing	Weed control			
			Prickly sida (SIDSP)		Pitted morningglory (IPOLA)	
			6/1	6/29	6/1	6/29
Untreated check			0	0	0	0
Pyriithiobac (Staple) <i>fb</i>	0.032	PRE	100	100	78	96
[pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.032 0.75 0.25%	3-4 LF				
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98 <i>fb</i>	0.032 0.75 0.25%	1 LF	0	100	0	97
[pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.032 0.75 0.25%	3-4 LF				
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98 <i>fb</i>	0.021 0.75 0.25%	1 LF	0	100	0	91
[pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.021 0.75 0.25%	3-4 LF				
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98 <i>fb</i>	0.032 0.75 0.25%	1 LF	0	100	0	95
pyriithiobac + glyphosate (Roundup Ultra)	0.032 0.75	3-4 LF				
Fluometuron + pyriithiobac	1.0 0.032	PRE	100	100	91	74
Fluometuron <i>fb</i> pyriithiobac +	1.0 0.032	PRE 1 LF	100	100	90	81
Fluometuron <i>fb</i> [pyriithiobac + glyphosate (Staple Plus)] + AG-98	1.0 0.021 0.75 0.25%	PRE 3-4 LF	100	100	93	98
LSD (0.05)			0	1	17	13

continued

Table 4. Section 2.

Herbicide	Rate (lb ai/A)	Application timing	Weed control		Effect on cotton	
			Barnyard- grass (ECHCG)	Broadleaf signalgrass (BRAPP)	Injury	Yield
			6/29	6/29	6/29	10/12
Untreated check			0	0	0	1676
Pyriithiobac (Staple) <i>fb</i>	0.032	PRE	100	99	4	2787
[pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.032 0.75 0.25%	3-4 LF				
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98 <i>fb</i>	0.032 0.75 0.25%	1 LF	100	100	0	2866
[pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.032 0.75 0.25%	3-4 LF				
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98 <i>fb</i>	0.021 0.75 0.25%	1 LF	100	100	0	3092
[pyriithiobac + glyphosate (Staple Plus)] + AG-98	0.021 0.75 0.25%	3-4 LF				
[Pyriithiobac + glyphosate (Staple Plus)] + AG-98 <i>fb</i>	0.032 0.75 0.25%	1 LF	100	100	1	2762
pyriithiobac + glyphosate (Roundup Ultra)	0.032 0.75	3-4 LF				
Fluometuron + pyriithiobac	1.0 0.032	PRE	98	99	0	2536
Fluometuron <i>fb</i> pyriithiobac +	1.0 0.032	PRE 1 LF	99	100	0	2492
Fluometuron <i>fb</i> [pyriithiobac + glyphosate (Staple Plus)] + AG-98	1.0 0.021 0.75 0.25%	PRE 3-4 LF	100	100	0	2871
LSD (0.05)			2	1	3	729

Table 5. Glyphosate (Roundup Ultra) Programs, Fayetteville, 2000.

TEST INFORMATION	
Location	Fayetteville
Experimental design / replications	RCB / 4
Plot size	3.3 ft x 27 ft
Row width / Number of rows per plot	40 inches / 1
Crop / Cultivar	cotton / DPL 451BR
Seeding rate	4 / ft
Planting date / Harvest date	May 22, 2000 / N/A
Soil type	Taloka silt loam (21 sand, 68% silt, 11% clay)
% OM / pH	1.1 / 5.7

Comments: PRE = preemergence; EOT = early over-the-top (1-lf, 3-inch cotton); LOT = late over-the-top (4-lf, 6-inch cotton); DIR = directed (7-lf, 7- to 10-inch cotton); and LAYBY = directed at layby stage of cotton (14-node, 28-inch cotton). Herbicide information can be found in Appendix Table 1.

Application

Type	PRE	EOT	LOT	DIR	LAYBY
Date applied	May 22, 2000	June 6, 2000	June 22, 2000	June 27, 2000	July 14, 2000
Time	6:30 pm	4:00 pm	5:00 pm	3:30 pm	7:00 pm
Incorporation equipment	N/A	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	77 / 77	79 / 84	88 / 89	85 / 86	84 / 85
Relative humidity (%)	80	65	75	65	68
Wind (mph)	4	2	3	3	2
Cloud cover (%)	20	0	0	70	0
Soil moisture	moist	moist	wet	wet	moist
Crop stage/height	N/A	1 lf / 2.5-3 in.	4 lf / 6-7 in.	7 lf / 7-10 in.	14 node / 28 in.
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/size	Flat fan / XR8002VS	Flat fan / XR8002VS	Flat fan / XR8002VS	Flat fan / / 0C01	Flat fan / / 0C01
Boom ht / # Noz / Spacing (in.)	20 / 2 / 18	21 / 2 / 18	25 / 2 / 18	8 / 2 / 18	9 / 2 / 18
Gpa / Psi	15 / 24	15 / 26	15 / 24	15 / 25	15 / 35
Weed species (density)	----- [no. of leaves / height (cm.)] -----				
DIGSA* (3/ft ²)		1-2 lf / >1 cm	3-7 lf / 3-5 cm	2-5 lf / 3-5 cm	8 lf / 8 cm
AMACH (1/ft ²)		cot.-2 lf / 0.5-1 cm	12 lf / 15 cm	cot.-2 lf / 1 cm	not present
AMAPA (2/plot)		cot - 2 lf / 0.5 cm	12 lf / 15 cm	not present	not present
IPOLA (5/ft ²)		1-2 lf / 3 cm	12-20 lf / 30 cm	9 lf / 4-10 cm	5-many lf / 6-12 cm
SEBEX (3/ft ²)		1-2 com. / 2-3.5 cm	6-8 lf / 13-19 cm	2-4 lf / 5-7 cm	5-8 lf / 10-20 cm
ABUTH (1/ft ²)		2 lf / 2 cm	8 lf / 23 cm	2-3 lf / 5 cm	not present
SIDSP (2/ft ²)		1-2 lf / 0.5 cm	5-10 lf / 3-6 cm	2-4 lf / 2-3 cm	8-many lf / 6-12 cm

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: The only species that was not controlled 95% with all glyphosate programs at all rating dates was pitted morningglory. However, by 12 days after the layby application, control was 92% with all treatments. Adding pyriithiobac to the EOT application of glyphosate increased control over glyphosate alone EOT. Plots treated with pendimethalin + fluometuron PRE and an LOT treatment of glyphosate did not need glyphosate DIR before layby. In summary, many application timing options with glyphosate are effective for broad-spectrum weed control.

Table 5. Section 1.

Herbicide	Rate (lb ai/A)	Application timing	Weed control							
			Large crabgrass (DIGSA)				Smooth pigweed (AMACH)			
			6/20	7/5	7/26	8/9	6/20	7/5	7/26	8/9
			----- % -----							
DIR treatments applied on if-needed basis; applications not needed are indicated by N/A:										
Untreated check			0	0	0	0	0	0	0	0
Pendimethalin (Prowl) + fluometuron (Meturon) <i>fb</i>	1.0		100	100	100	100	100	100	100	100
glyphosate (RU Ultra) <i>fb</i>	0.75	PRE								
glyphosate [not needed] <i>fb</i>	0.75	LOT								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate	0.75	N/A								
glyphosate	0.75	LAYBY								
Pendimethalin + fluometuron <i>fb</i>	1.0		100	100	100	100	100	100	100	100
glyphosate <i>fb</i>	1.2	PRE								
glyphosate + diuron (Direx) [not needed] <i>fb</i>	0.75	LOT								
glyphosate + diuron (Direx) [not needed] <i>fb</i>	0.75									
glyphosate [not needed] <i>fb</i>	0.4	N/A								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate	0.75	LAYBY								
Glyphosate <i>fb</i>	0.5	EOT	100	100	100	100	100	100	100	100
glyphosate <i>fb</i>	0.5	LOT								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate	0.75	LAYBY								
Glyphosate <i>fb</i>	0.75	EOT	100	100	100	100	100	100	100	100
glyphosate <i>fb</i>	0.75	DIR								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate	0.75	LAYBY								
Glyphosate + pyrithiobac (Staple) <i>fb</i>	0.75		100	100	100	100	100	100	100	100
glyphosate <i>fb</i>	0.042	EOT								
glyphosate [not needed] <i>fb</i>	0.75	DIR								
glyphosate	0.75	N/A								
glyphosate	0.75	LAYBY								
Glyphosate <i>fb</i>	0.75	EOT	100	100	100	100	100	100	100	100
glyphosate + diuron <i>fb</i>	0.75									
glyphosate [not needed] <i>fb</i>	0.4	DIR								
glyphosate	0.75	N/A								
glyphosate	0.75	LAYBY								
Glyphosate <i>fb</i>	0.75	EOT	100	100	100	100	100	100	100	100
prometryn (Caparol) + MSMA (Bueno 6) <i>fb</i>	0.5									
prometryn [not needed] + MSMA [not needed] <i>fb</i>	1.5	DIR								
diuron + AG-98	0.5									
	1.5	N/A								
	0.8									
	0.25%	LAYBY								
LSD (0.05)			1	1	1	1	1	1	1	1

continued

Table 5. Section 2.

Herbicide	Rate (lb ai/A)	Application timing	Weed control							
			Palmer amaranth (AMAPA)				Pitted morningglory (IPOLA)			
			6/20	7/5	7/26	8/9	6/20	7/5	7/26	8/9
			----- % -----							
DIR treatments applied on if-needed basis; applications not needed are indicated by N/A:										
Untreated check			0	0	0	0	0	0	0	0
Pendimethalin (Prowl) + fluometuron (Meturon) <i>fb</i>	1.0		100	100	100	100	98	100	98	99
glyphosate (RU Ultra) <i>fb</i>	0.75	PRE								
glyphosate [not needed] <i>fb</i>	0.75	LOT								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate	0.75	N/A								
glyphosate	0.75	LAYBY								
Pendimethalin + fluometuron <i>fb</i>	1.0		100	100	100	100	97	99	100	100
glyphosate <i>fb</i>	1.2	PRE								
glyphosate [+ diuron (Direx) [not needed] <i>fb</i>	0.75	LOT								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate	0.75	N/A								
glyphosate	0.75	LAYBY								
Glyphosate <i>fb</i>	0.5	EOT	100	100	100	100	82	89	94	95
glyphosate <i>fb</i>	0.5	LOT								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate	0.75	LAYBY								
Glyphosate <i>fb</i>	0.75	EOT	100	100	100	100	81	77	92	93
glyphosate <i>fb</i>	0.75	DIR								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate	0.75	LAYBY								
Glyphosate + pyrithiobac (Staple) <i>fb</i>	0.75		100	100	100	100	87	94	99	98
glyphosate <i>fb</i>	0.042	EOT								
glyphosate [not needed] <i>fb</i>	0.75	DIR								
glyphosate	0.75	N/A								
glyphosate	0.75	LAYBY								
Glyphosate <i>fb</i>	0.75	EOT	100	100	100	100	87	84	96	98
glyphosate + diuron <i>fb</i>	0.75									
glyphosate [not needed] <i>fb</i>	0.4	DIR								
glyphosate	0.75	N/A								
glyphosate	0.75	LAYBY								
Glyphosate <i>fb</i>	0.75	EOT	100	100	100	100	84	78	91	98
prometryn (Caparol) + MSMA (Bueno 6) <i>fb</i>	0.5									
prometryn [not needed] + MSMA [not needed] <i>fb</i>	1.5	DIR								
diuron + AG-98	0.5	N/A								
	1.5									
	0.8									
	0.25%	LAYBY								
LSD (0.05)			1	1	1	1	3	6	5	4

continued

Table 5. Section 3.

Herbicide	Rate (lb ai/A)	Application timing	Weed control							
			Hemp sesbania (SEBEX)				Prickly sida (SIDSP)			
			6/20	7/5	7/26	8/9	6/20	7/5	7/26	8/9
			----- % -----							
DIR treatments applied on if-needed basis; applications not needed are indicated by N/A:										
Untreated check			0	0	0	0	0	0	0	0
Pendimethalin (Prowl) + fluometuron (Meturon) <i>fb</i>	1.0 1.2	PRE	99	100	100	100	100	100	100	100
glyphosate (RU Ultra) <i>fb</i>	0.75	LOT								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate	0.75	LAYBY								
Pendimethalin + fluometuron <i>fb</i>	1.0 1.2	PRE	99	100	100	100	100	100	100	100
glyphosate <i>fb</i>	0.75	LOT								
glyphosate + diuron (Direx) [not needed] <i>fb</i>	0.75 0.4	N/A								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate	0.75	LAYBY								
Glyphosate <i>fb</i>	0.5	EOT	99	100	100	100	99	100	100	100
glyphosate <i>fb</i>	0.5	LOT								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate	0.75	LAYBY								
Glyphosate <i>fb</i>	0.75	EOT	100	100	100	99	100	100	100	100
glyphosate <i>fb</i>	0.75	DIR								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate	0.75	LAYBY								
Glyphosate + pyrithiobac (Staple) <i>fb</i>	0.75 0.042	EOT	100	100	100	100	100	100	100	100
glyphosate <i>fb</i>	0.75	DIR								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate	0.75	LAYBY								
Glyphosate <i>fb</i>	0.75	EOT	100	100	100	100	100	100	100	100
glyphosate + diuron <i>fb</i>	0.75 0.4	DIR								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate	0.75	LAYBY								
Glyphosate <i>fb</i>	0.75	EOT	99	98	100	100	99	100	98	99
prometryn (Caparol) + MSMA (Bueno 6) <i>fb</i>	0.5 1.5	DIR								
prometryn [not needed] + MSMA [not needed] <i>fb</i>	0.5 1.5	N/A								
diuron + AG-98	0.8 0.25%	LAYBY								
LSD (0.05)			1	2	1	1	1	1	1	1

continued

Table 5. Section 3.

Herbicide	Rate (lb ai/A)	Application timing	Weed control				Cotton injury			
			Velvetleaf (ABUTH)							
			6/20	7/5	7/26	8/9	6/20	7/5	7/26	8/9
			----- % -----							
DIR treatments applied on if-needed basis; applications not needed are indicated by N/A:										
Untreated check			0	0	0	0	0	0	0	0
Pendimethalin (Prowl) + fluometuron (Meturon) <i>fb</i>	1.0 1.2	PRE	99	100	100	100	0	0	0	0
glyphosate (RU Ultra) <i>fb</i>	0.75	LOT								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate	0.75	LAYBY								
Pendimethalin + fluometuron <i>fb</i>	1.0 1.2	PRE	100	100	100	100	0	0	0	0
glyphosate <i>fb</i>	0.75	LOT								
glyphosate [+ diuron (Direx) [not needed] <i>fb</i>	0.75 0.4	N/A								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate	0.75	LAYBY								
Glyphosate <i>fb</i>	0.5	EOT	100	100	100	100	0	0	0	0
glyphosate <i>fb</i>	0.5	LOT								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate	0.75	LAYBY								
Glyphosate <i>fb</i>	0.75	EOT	100	100	100	100	0	0	0	0
glyphosate <i>fb</i>	0.75	DIR								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate	0.75	LAYBY								
Glyphosate + pyrithiobac (Staple) <i>fb</i>	0.75 0.042	EOT	100	100	100	100	0	5	0	0
glyphosate <i>fb</i>	0.75	DIR								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate	0.75	LAYBY								
Glyphosate <i>fb</i>	0.75	EOT	100	99	100	100	0	2	0	0
glyphosate + diuron <i>fb</i>	0.75 0.4	DIR								
glyphosate [not needed] <i>fb</i>	0.75	N/A								
glyphosate	0.75	LAYBY								
Glyphosate <i>fb</i>	0.75	EOT	100	99	95	99	0	2	0	0
prometryn (Caparol) + MSMA (Bueno 6) <i>fb</i>	0.5 1.5	DIR								
prometryn [not needed] + MSMA [not needed] <i>fb</i>	0.5 1.5	N/A								
diuron + AG-98	0.8 0.25%	LAYBY								
LSD (0.05)			1	1	3	1	NS	NS	NS	NS

Table 6. Glyphosate cotton selectivity trial, Marianna, 2000.

TEST INFORMATION

Location	Marianna	Crop / Cultivar	cotton / DP 451 B/RR
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 40 ft	Planting date / Harvest date	May 24, 2000 / Oct. 13, 2000
Row width / Number of rows per plot	38 in. / 4	Soil type	silt loam (2% sand, 86% silt, 12% clay)
		% OM / pH	1.1 / 5.7

Comments: EOT = early over-the-top (cot.- to 1-leaf cotton); LOT = late over-the-top (4-leaf cotton); EDIR = early directed (8-leaf cotton); and LDIR = late directed (13-leaf cotton). Herbicide information can be found in Appendix Table 1.

Application

Type	EOT	LOT	EDIR	LDIR
Date applied	June 5, 2000	June 19, 2000	June 28, 2000	July 8, 2000
Time	2:00 pm	6:00 am	2:00 pm	N/A
Incorporation equipment	N/A	N/A	N/A	N/A
Air temperature (F)	73	70	86	95
Wind (mph)	5	3	5	N/A
Cloud cover (%)	40	0	30	0
Soil moisture	adequate	excessive	adequate	adequate
Crop stage/height	cot.-1 lf	4 lf	8 lf / 15"	13 lf / 23"
Sprayer type/mph	Tractor / 3.5	Tractor / 3.5	Tractor / 4.3	Tractor / 4.3
Nozzle type/size	Flat fan / 11003	Flat fan / 11103	Flat fan / 11002	Flat fan / 11002
Boom ht/# Noz/Spacing (in.)	16 / 8 / 19	16 / 8 / 19	4 / 8 / 19	4 / 8 / 19
Gpa / Psi	20 / 27	20 / 27	15 / 22	15 / 22

Conclusions: Visual cotton injury was $\leq 14\%$ at the first rating date and did not differ significantly by 1 week after LOT applications. Percent square shed, number of squares/acre, number of fruiting nodes/plant, and plant height did not differ among treatments, which were all within the glyphosate label. First fruiting node ranged from 6.2 to 6.9 and did not differ among treatments. Glyphosate did not affect maturity as indicated by NAWF and days to NAWF=5. Position of fruit tended to differ slightly with application stage. Cotton treated with glyphosate at the 4-leaf stage or with four applications (total of 4 lb/A) tended to have less sympodial branches with 1st-position bolls and more with 2nd-position bolls. Percent boll retention at the 1st position was also less for these 4-leaf or repeated treatments. Yields, however, did not differ among treatments. It appears that both glyphosate formulations caused some stress on the cotton plant when applied at the 4-leaf stage or with a total of 4 lb/A applied throughout the season, but the cotton plant compensated with 2nd-position fruit, and no yield reduction occurred.

Table 6. Section 1.

Herbicide	Rate (lb ai/A)	Application timing	Cotton injury ²		Square shed			Number of squares		
			6/9	6/12	6/28	7/5	7/12	6/28	7/5	7/12
			----- % -----		----- % -----			----- (no./A) -----		
Glyphomax Plus and Roundup Ultra are formulations of glyphosate.										
Untreated			1	0	2.38	4.00	2.17	180774	259468	308717
Glyphomax Plus	1	EOT	0	0	1.67	4.15	4.55	169268	271964	309734
Glyphomax Plus	2	EOT	8	9	6.20	1.50	5.95	155927	276018	306200
Roundup Ultra	1	EOT	4	0	0.73	2.47	2.10	164152	267808	304361
Roundup Ultra	2	EOT	14	8	7.17	0.00	2.58	160284	276974	312128
Glyphomax Plus	1	LOT	0	0	3.00	2.05	0.90	170672	270516	305293
Glyphomax Plus	2	LOT	0	0	0.80	0.47	0.83	162490	261288	282395
Roundup Ultra	1	LOT	0	0	1.47	5.43	1.70	175616	255112	292482
Roundup Ultra	2	LOT	0	0	1.52	0.50	2.20	172363	275488	301252
Glyphomax Plus <i>fb</i>	1	EOT	1	0	2.30	2.25	5.45	176017	302570	315438
Glyphomax Plus <i>fb</i>	1	LOT								
Glyphomax Plus <i>fb</i>	1	EDIR								
Glyphomax Plus	1	LDIR								
Roundup Ultra <i>fb</i>	1	EOT	2	0	2.47	3.03	3.03	155956	247547	293895
Roundup Ultra <i>fb</i>	1	LOT								
Roundup Ultra <i>fb</i>	1	EDIR								
Roundup Ultra	1	LDIR								
LSD (0.05)			3	2	NS	NS	NS	NS	NS	NS

continued

Table 6. Section 2.

Herbicide	Rate (lb ai/A)	Application timing	Fruiting nodes			Plant height				
			6/28	7/5	7/12	6/28	7/5	7/12	9/29	
			----- (no./plant) -----			----- (inches) -----				
Glyphomax Plus and Roundup Ultra are formulations of glyphosate.										
Untreated			3.4	5.0	5.8	18	24	27	43	
Glyphomax Plus	1	EOT	3.2	5.2	6.0	17	23	25	41	
Glyphomax Plus	2	EOT	3.1	5.0	5.8	16	22	25	42	
Roundup Ultra	1	EOT	3.0	5.2	5.9	17	23	25	41	
Roundup Ultra	2	EOT	3.2	5.1	5.9	16	22	24	39	
Glyphomax Plus	1	LOT	3.2	5.2	5.8	17	22	25	42	
Glyphomax Plus	2	LOT	3.2	5.2	5.8	18	22	26	41	
Roundup Ultra	1	LOT	3.4	5.2	5.8	17	23	26	38	
Roundup Ultra	2	LOT	3.2	5.1	5.7	16	22	24	41	
Glyphomax Plus <i>fb</i>	1	EOT	3.2	5.5	5.9	17	23	26	44	
Glyphomax Plus <i>fb</i>	1	LOT								
Glyphomax Plus <i>fb</i>	1	EDIR								
Glyphomax Plus	1	LDIR								
Roundup Ultra <i>fb</i>	1	EOT	3.0	5.0	5.8	17	22	25	44	
Roundup Ultra <i>fb</i>	1	LOT								
Roundup Ultra <i>fb</i>	1	EDIR								
Roundup Ultra	1	LDIR								
LSD (0.05)			NS	NS	NS	NS	NS	NS	NS	

continued

Table 6. Section 3.

Herbicide	Rate	Application timing	Nodes above			Days to NAWF=5	First fruiting node	Number of sympodia with:	
			white flower (NAWF)					1st position boll	2nd position boll
			7/19	7/27	8/4				
(lb/A)	---- (no./plant) ---			8/4	9/29	9/29	9/29		
						(no. of days)	(no. sympodia/plant)		
Glyphomax Plus and Roundup Ultra are formulations of glyphosate.									
Untreated			6.8	5.8	5.3	74.8	6.7	3.72	1.65
Glyphomax Plus	1	EOT	7.0	6.1	5.4	77.0	6.7	3.85	1.45
Glyphomax Plus	2	EOT	7.4	6.3	5.4	75.3	6.8	3.30	1.67
Roundup Ultra	1	EOT	7.4	6.0	5.3	74.0	6.8	4.20	1.30
Roundup Ultra	2	EOT	7.1	5.8	5.4	75.0	6.2	3.23	1.60
Glyphomax Plus	1	LOT	7.1	6.0	5.3	75.0	6.9	2.85	2.65
Glyphomax Plus	2	LOT	7.8	6.5	5.3	75.0	6.9	2.35	2.38
Roundup Ultra	1	LOT	7.3	6.2	5.3	74.3	6.6	2.67	2.25
Roundup Ultra	2	LOT	7.6	6.2	5.0	72.0	6.7	2.70	2.27
Glyphomax Plus <i>fb</i>	1	EOT	7.4	6.4	5.8	79.3	6.6	2.80	2.30
Glyphomax Plus <i>fb</i>	1	LOT							
Glyphomax Plus <i>fb</i>	1	EDIR							
Glyphomax Plus	1	LDIR							
Roundup Ultra <i>fb</i>	1	EOT	7.6	6.4	5.8	80.0	6.7	2.63	2.25
Roundup Ultra <i>fb</i>	1	LOT							
Roundup Ultra <i>fb</i>	1	EDIR							
Roundup Ultra	1	LDIR							
LSD (0.05)			NS	NS	NS	NS	NS	1.02	0.67

continued

Table 6. Section 4.

Herbicide	Rate	Appli- cation timing	Total bolls 9/29	Boll retention			Total bolls		Seed cotton yield 10/13 (lb/A)
				Early boll retention ^y 9/29	1st position ^x 9/29	2nd position ^w 9/29	1st position ^v 9/29	2nd position ^u 9/29	
			(no./plant)	----- (%) -----					
Glyphomax Plus and Roundup Ultra are formulations of glyphosate.									
Untreated			12.2	46.5	37.8	29.7	43.6	26.6	2979
Glyphomax Plus	1	EOT	11.6	49.3	38.9	27.3	46.2	25.2	2939
Glyphomax Plus	2	EOT	10.5	40.0	30.7	24.4	40.9	25.3	2649
Roundup Ultra	1	EOT	11.2	43.8	38.9	25.3	47.3	23.2	2954
Roundup Ultra	2	EOT	11.4	39.8	37.4	26.6	44.5	24.8	3185
Glyphomax Plus	1	LOT	9.6	33.8	25.7	32.2	37.0	34.8	2669
Glyphomax Plus	2	LOT	9.4	18.8	20.4	27.2	30.0	30.6	2399
Roundup Ultra	1	LOT	10.4	28.4	24.4	27.5	30.3	23.1	2635
Roundup Ultra	2	LOT	11.2	27.3	25.4	29.2	32.2	28.7	2438
Glyphomax Plus <i>fb</i>	1	EOT	10.0	29.3	25.1	27.2	36.6	31.8	2753
Glyphomax Plus <i>fb</i>	1	LOT							
Glyphomax Plus <i>fb</i>	1	EDIR							
Glyphomax Plus	1	LDIR							
Roundup Ultra <i>fb</i>	1	EOT	10.4	23.5	22.3	25.3	31.8	27.3	2728
Roundup Ultra <i>fb</i>	1	LOT							
Roundup Ultra <i>fb</i>	1	EDIR							
Roundup Ultra	1	LDIR							
LSD (0.05)			NS	11.5	10.7	NS	9.8	5.9	NS

^z No significant visible cotton injury was observed after June 12.

^y Percent early boll retention (EBR) = sum over first five sympodia: $[(FB + SB + 2BB)/10] \times 100$, where *FB* = no. of sympodia with a boll at first position; *SB* = no. of sympodia with a boll at second position; *BB* = no. of sympodia with bolls in first and second position.

^x Percent boll retention at first sympodial positions = $[(FB + BB)/S] \times 100$, where *FB* = no. of sympodia with a boll in first position; *BB* = no. of sympodia with bolls in first and second position; and *S* = no. of sympodia on main axis.

^w Percent boll retention at second sympodial positions = $[(SB + BB)/H2] \times 100$, where *SB* = no. of sympodia with a boll at second position; *BB* = no. of sympodia with bolls in both first and second position; and *H2* = no. of highest sympodia with at least two nodal positions.

^v Percent total bolls at first position = $[(FB + BB)/TB] \times 100$, where *FB* = no. of sympodia with a boll in first position; *BB* = no. of sympodia with bolls in first and second position; and *TB* = total bolls per plant.

^u Percent total bolls at second position = $[(SB + BB)/TB] \times 100$, where *SB* = no. of sympodia with a boll in second position; *BB* = no. of sympodia with bolls in first and second position; and *TB* = total bolls per plant.

Table 7. Value of soil residual herbicides in glyphosate-tolerant (Roundup Ready) cotton, Rohwer, 2000.

TEST INFORMATION

Location	Rohwer	Crop / Cultivar	cotton / DP 451 B/RR
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 35 ft	Planting date / Harvest date	May 25, 2000 / Oct. 12, 2000
Row width / Number of rows per plot	38 in. / 4	Soil type	silt loam (16% sand, 67% silt, 17% clay)
		% OM / pH	1.1 / 7.1

Comments: PPI = preplant incorporated; PRE = preemergence; EPOST = early postemergence over-the-top; DIR = post-directed at 6-leaf cotton; and LAYBY = at cotton layby stage. Herbicide information can be found in Appendix Table 1.

Application

Type	PPI	PRE	EPOST	DIR	LAYBY
Date applied	May 25, 2000	May 26, 2000	June 16, 2000	June 26, 2000	July 11, 2000
Time	7:30 am	7:30 am	8:00 am	2:00 pm	9:00 am
Incorporation equipment	Levelband	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	80 / 76	78 / 77	81 / 79	90 / 76	85 / 75
Relative humidity (%)	85	86	81	80	80
Wind (mph)	2	5	5	4	4
Cloud cover (%)	100	100	80	60	0
Soil moisture	optimal	optimal	dry	dry	dry
Crop stage/height	N/A	N/A	2-3 lf / 3"	6-8 lf / 8"	12-14 lf / 22"
Sprayer type	Tractor	BkPkCO ₂	BkPkCO ₂	Tractor	Tractor
Nozzle type/size	Flat fan/8002VS	Flat fan/8002VS	Air induc/11002VS	Flat fan/0C02	Flood/TK5
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19	22 / 8 / 19	4 / 8 / 19	4 / 4 / 38
Gpa / Psi	15 / 22	15 / 22	15 / 22	15 / 18	15 / 18
Weed species (density)	----- [height (in.)] -----				
IPOLA* (light)	3" 8" 22"				
AMARE (light)	3" 8" 22"				
SIDSP (light)	3" 8" 22"				

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: Glyphosate (Roundup Ultra) was applied alone and in combination with herbicides that provide residual activity to evaluate the need for residual activity in a Roundup Ready cotton weed-control program. Glyphosate alone in sequential applications was equal or superior to soil residual herbicides with or without glyphosate. Sequential applications of glyphosate alone controlled greater than 98% of redroot pigweed and greater than 90% of pitted morningglory and prickly sida.

Table 7.

Herbicide	Rate (lb/A)	Application timing	Weed control			Seedcotton yield (lb/A)
			Redroot pigweed (AMARE)	Pitted morningglory (IPOLA)	Prickly sida (SIDSP)	
			8/24	8/24	8/24	
Untreated check		0	0	0	634	
Pendimethalin <i>fb</i>	1.0	PPI	99	89	90	3166
fluometuron <i>fb</i>	1.0	PRE				
fluometuron + MSMA <i>fb</i>	1.0					
diuron + MSMA	2.0	DIR				
	0.5					
	2.0	LAYBY				
Pendimethalin <i>fb</i>	1.0	PPI	100	97	97	2900
glyphosate <i>fb</i>	1.0	EPOST				
glyphosate <i>fb</i>	1.0	DIR				
glyphosate	1.0	LAYBY				
Pendimethalin <i>fb</i>	1.0	PPI	100	98	97	3180
glyphosate <i>fb</i>	1.0	EPOST				
glyphosate <i>fb</i>	1.0	DIR				
glyphosate + diuron	1.0					
	0.5	LAYBY				
Glyphosate <i>fb</i>	1.0	EPOST	100	97	97	3677
glyphosate <i>fb</i>	1.0	DIR				
glyphosate	1.0	LAYBY				
Glyphosate <i>fb</i>	1.0	EPOST	100	97	97	3185
glyphosate <i>fb</i>	1.0	DIR				
glyphosate + diuron	1.0					
	0.5	LAYBY				
Fluometuron <i>fb</i>	1.0	PRE	100	97	97	3682
glyphosate <i>fb</i>	1.0	DIR				
glyphosate	1.0	LAYBY				
Fluometuron <i>fb</i>	1.0	PRE	100	97	97	3795
glyphosate <i>fb</i>	1.0	DIR				
glyphosate + diuron	1.0					
	0.5	LAYBY				
Glyphosate <i>fb</i>	1.0	EPOST	96	98	98	3490
glyphosate + fluometuron <i>fb</i>	1.0					
	1.0	DIR				
glyphosate	1.0	LAYBY				
Glyphosate <i>fb</i>	1.0	EPOST	95	97	97	3240
glyphosate <i>fb</i>	1.0	DIR				
glyphosate	1.0	LAYBY				
Pendimethalin <i>fb</i>	1.0	PPI	100	97	98	3293
fluometuron <i>fb</i>	1.0	PRE				
glyphosate <i>fb</i>	1.0	EPOST				
glyphosate <i>fb</i>	1.0	DIR				
glyphosate	1.0	LAYBY				
Pendimethalin <i>fb</i>	1.0	PPI	100	97	97	3323
fluometuron <i>fb</i>	1.0	PRE				
glyphosate <i>fb</i>	1.0	EPOST				
glyphosate <i>fb</i>	1.0	DIR				
glyphosate + diuron	1.0					
	0.5	LAYBY				

continued

Table 7. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control			Seedcotton yield (lb/A)
			Redroot pigweed (AMARE)	Pitted morningglory (IPOLA)	Prickly sida (SIDSP)	
			8/24	8/24	8/24	
			----- (%) -----			
Glyphosate + pyrithiobac <i>fb</i>	1.0		100	97	96	3220
glyphosate <i>fb</i>	0.032	EPOST				
glyphosate	1.0	DIR				
	1.0	LAYBY				
Glyphosate + pyrithiobac <i>fb</i>	1.0		100	88	88	3343
glyphosate <i>fb</i>	0.032	EPOST				
glyphosate + diuron	1.0	DIR				
	0.5	LAYBY				
LSD (0.05)			3	2	2	729

Table 8. Morningglory control in Roundup Ready (glyphosate-tolerant) cotton, Rohwer, 2000.**TEST INFORMATION**

Location	Rohwer	Crop / Cultivar	cotton / DP 451 B/RR
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 40 ft	Planting date	May 24, 2000
Row width / Number of rows per plot	38 in. / 4	Soil type ...	Hebert silt loam (16% sand, 67% silt, 17% clay)
		% OM / pH	1.1 / 7.1

Comments: PRE = preemergence; and 2-3 LF = over-the-top of 2- to 3-leaf cotton. Glyphosate is original formulation without surfactant (Roundup) except where noted as RU (Roundup Ultra) and is used to simulate the premix formulation of pyriithiobac + glyphosate, which will be called Staple Plus. Herbicide information can be found in Appendix Table 1.

Application

Type	PRE	2-3 LF
Date applied	May 25, 2000	June 13, 2000
Time	7:45 am	9:00 am
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	80 / 76	89 / 81
Relative humidity (%)	85	57
Wind (mph)	2	2
Cloud cover (%)	100	50
Soil moisture	optimal	optimal
Crop stage/height	N/A	2-3 lf / 6"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/size	Flat fan / 8002VS	Flat fan / 8002VS
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19
Gpa / Psi	15 / 22	15 / 22
Weed species (density)	-----[height (in.)]-----	
IPOLA* (light)		6"
SIDSP (light)		6"
AMARE (light)		6"
ECHCG (light)		6"
BRAPP (light)		6"

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: Fluometuron (Cotoran), prometryn (Caparol), and pyriithiobac (Staple) were applied PRE followed by combinations of glyphosate (Roundup) and pyriithiobac at the 2- to 3-leaf stage of cotton to evaluate morningglory control in a Roundup Ready cotton weed-control program. Fluometuron provided excellent control of pitted morningglory, but control with pyriithiobac and prometryn was less than 85%. However, when pyriithiobac and prometryn were applied together or with fluometuron, control was increased to greater than 90%. POST applications of glyphosate alone failed to control morningglory, but when glyphosate was combined with pyriithiobac, control was increased to greater than 95%.

Table 8. Section 1.

Herbicide	Rate (lb ai/A)	Application timing	Weed control						
			Pitted morningglory (IPOLA)			Prickly sida (SIDSP)			Broadleaf signalgrass (BRAPP)
			6/16	6/20	6/28	6/16	6/20	6/28	6/16
Untreated check			0	0	0	0	0	0	0
Pyrithiobac (Staple) <i>fb</i>	0.032	PRE	68	91	92	80	100	100	82
[pyrithiobac + glyphosate (Staple Plus)] + AG-98	0.032 0.75 0.5%	2-3 LF							
Pyrithiobac <i>fb</i> glyphosate (RU)	0.032 0.75	PRE 2-3 LF	78	91	79	100	100	100	90
Prometryn (Caparol) <i>fb</i> [pyrithiobac + glyphosate (Staple Plus)] + AG-98	1.0 0.032 0.75 0.5%	PRE 2-3 LF	77	90	91	88	100	100	87
Prometryn <i>fb</i> glyphosate (RU)	1.0 0.75	PRE 2-3 LF	76	91	80	99	100	100	100
Fluometuron (Cotoran) <i>fb</i> [pyrithiobac + glyphosate (Staple Plus)] + AG-98	1.0 0.032 0.75 0.5%	PRE 2-3 LF	70	94	93	100	100	100	100
Fluometuron <i>fb</i> glyphosate (RU)	1.0 0.75	PRE 2-3 LF	78	90	91	100	100	100	100
Pyrithiobac + fluometuron <i>fb</i> [pyrithiobac + glyphosate (Staple Plus)] + AG-98	0.032 1.0 0.032 0.75 0.5%	PRE 2-3 LF	98	98	99	100	100	100	100
Pyrithiobac + fluometuron <i>fb</i> glyphosate (RU)	0.032 1.0 0.75	PRE 2-3 LF	98	99	97	100	100	100	100
Pyrithiobac + prometryn <i>fb</i> [pyrithiobac + glyphosate (Staple Plus)] + AG-98	0.032 1.0 0.032 0.75 0.5%	PRE 2-3 LF	99	98	98	100	100	100	97
Pyrithiobac + prometryn <i>fb</i> glyphosate (RU)	0.032 1.0 0.75	PRE 2-3 LF	88	95	85	100	100	100	88
[Pyrithiobac + glyphosate (orig.) (Staple Plus)] + AG-98	0.032 0.75 0.5%	2-3 LF	15	69	85	25	98	100	80
Glyphosate (RU)	0.75	2-3 LF	25	60	60	28	100	75	68
Pyrithiobac + fluometuron <i>fb</i> glyphosate (RU)	0.032 1.0 0.75	PRE 2-3 LF	89	90	81	100	100	100	100
Pyrithiobac + fluometuron <i>fb</i> [pyrithiobac + glyphosate (Staple Plus)] + AG-98	0.032 1.0 0.032 0.75 0.5%	PRE 2-3 LF	100	100	99	100	100	100	100
LSD (0.05)			30	11	10	17	2	18	17

continued

Table 8. Section 2.

Herbicide	Rate (lb ai/A)	Application timing	Weed control					
			Redroot pigweed (AMARE)		Barnyardgrass (ECHCG)	Cotton injury		
			6/20	6/28	6/20	6/16	6/20	6/28
Untreated check			0	0	0	0	0	0
Pyrithiobac (Staple) <i>fb</i> [pyrithiobac + glyphosate (Staple Plus)] + AG-98	0.032 0.032 0.75 0.5%	PRE 2-3 LF	100	100	99	10	3	3
Pyrithiobac <i>fb</i> glyphosate (RU)	0.032 0.75	PRE 2-3 LF	100	100	95	0	0	1
Prometryn (Caparol) <i>fb</i> [pyrithiobac + glyphosate (Staple Plus)] + AG-98	1.0 0.032 0.75 0.5%	PRE 2-3 LF	100	100	100	5	0	1
Prometryn <i>fb</i> glyphosate (RU)	1.0 0.75	PRE 2-3 LF	100	100	100	0	0	1
Fluometuron (Cotoran) <i>fb</i> [pyrithiobac + glyphosate (Staple Plus)] + AG-98	1.0 0.032 0.75 0.5%	PRE 2-3 LF	100	100	100	0	0	0
Fluometuron <i>fb</i> glyphosate (RU)	1.0 0.75	PRE 2-3 LF	100	100	100	0	0	1
Pyrithiobac + fluometuron <i>fb</i> [pyrithiobac + glyphosate (Staple Plus)] + AG-98	0.032 1.0 0.032 0.75 0.5%	PRE 2-3 LF	100	100	100	0	0	4
Pyrithiobac + fluometuron <i>fb</i> glyphosate (RU)	0.032 1.0 0.75	PRE 2-3 LF	100	100	100	0	0	3
Pyrithiobac + prometryn <i>fb</i> [pyrithiobac + glyphosate (Staple Plus)] + AG-98	0.032 1.0 0.032 0.75 0.5%	PRE 2-3 LF	100	100	100	9	0	9
Pyrithiobac + prometryn <i>fb</i> glyphosate (RU)	0.032 1.0 0.75	PRE 2-3 LF	100	100	100	1	0	1
[Pyrithiobac + glyphosate (Staple Plus)] + AG-98	0.032 0.75 0.5%	2-3 LF	100	100	98	4	0	1
Glyphosate (RU)	0.75	2-3 LF	100	75	100	1	0	0
Pyrithiobac + fluometuron <i>fb</i> glyphosate (RU)	0.032 1.0 0.75	PRE 2-3 LF	100	100	100	0	0	1
Pyrithiobac + fluometuron <i>fb</i> [pyrithiobac + glyphosate (Staple Plus)] + AG-98	0.032 1.0 0.032 0.75 0.5%	PRE 2-3 LF	100	100	100	1	0	5
LSD (0.05)			0	18	4	4	2	4

Table 9. Glyphosate cotton selectivity with different adjuvant systems, Marianna, 2000.

TEST INFORMATION

Location	Marianna	Crop / Cultivar	cotton / DPL 451 BR
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 30 ft	Planting date / Harvest date	May 24, 2000 / Oct. 13, 2000
Row width / Number of rows per plot	38 in. / 4	Soil type	silt loam (2% sand, 86% silt, 12% clay)
		% OM / pH	1.1 / 5.7

Comments: Application stages refer to number of cotton leaves. Herbicide information can be found in Appendix Table 1.

Application

Type	COT. - 1 LF	4 LF	6 LF
Date applied	June 5, 2000	June 19, 2000	June 23, 2000
Time	5:00 pm	7:00 am	7:00 am
Incorporation equipment	N/A	N/A	N/A
Air temperature (F)	73	70	70
Relative humidity (%)	N/A	72	73
Wind (mph)	5	2	3
Cloud cover (%)	40	0	0
Soil moisture	adequate	excessive	excessive
Crop stage	cot. - 1-lf	4 lf	6 lf
Sprayer type/mph	Tractor / 3.5	Tractor / 3.5	Tractor / 3.5
Nozzle type/size	Flat fan / 11003	Flat fan / 11003	Flat fan / 11003
Boom ht / # Noz / Spacing (in.)	16 / 8 / 19	16 / 8 / 19	16 / 8 / 19
Gpa / Psi	20 / 27	20 / 27	20 / 27

Conclusions: Cotton injury was generally greater with the adjuvants Surf King and Intensify applied at the cot.- to 1-leaf stage of cotton growth than with other adjuvants. JS 80:20 also caused slight injury 1 week after the cot.- to 1-leaf application, but that injury did not differ significantly from cotton treated with the Glyphos X-tra and Roundup Ultra formulations. Cotton stunting was still evident 1 week after the 4-leaf applications of Surf King and Intensify, but there was no visible injury from any treatment by 2 weeks after 6-leaf application (3 weeks after 4-leaf application). Yields among treatments did not differ at the 0.05 level of significance but were different at P=0.0656. Yield reductions at this level, however, could not be associated with early cotton injury.

Table 9.

Herbicide	Rate (lb ai/A)	Application timing	Effect on cotton							
			General injury ^z				Stunting ^y			Yield 10/13 (lb/A)
			6/7	6/9	6/12	6/27	6/12	6/22	6/27	

NOTE: Glyphos = glyphosate; Glyphos X-tra = glyphosate + adjuvant.

Untreated			0.0	0.0	0.0	0.0	0.0	0.0	0.0	2988
Glyphos +	1.0		2.5	2.5	0.0	1.3	0.0	2.5	1.3	2728
Array fb	9 lb/100 gal	COT.- 1 LF								
Glyphos +	1.0									
Array	9 lb/100 gal	4 LF								
Glyphos +	1.0		3.8	3.8	0.0	0.0	0.0	0.0	0.0	2320
Array fb	9 lb/100 gal	COT.- 1 LF								
Glyphos +	1.0									
Array	9 lb/100 gal	6 LF								

continued

Table 9. Continued.

Herbicide	Rate (lb ai/A)	Application timing	Effect on cotton							
			General injury ^z				Stunting ^y			Yield
			6/7	6/9	6/12	6/27	6/12	6/22	6/27	10/13
			----- % -----							(lb/A)
Glyfos + Int Exp 113 <i>fb</i>	1.0 13.33 lb/100 gal	COT.- 1 LF	3.8	2.5	1.3	0.0	0.0	0.0	0.0	2698
Glyfos + Int Exp 113	1.0 13.33 lb/100 gal	4 LF								
Glyfos + Int Exp 113 <i>fb</i>	1.0 13.33 lb/100 gal	COT.- 1 LF	5.0	3.8	0.0	0.0	0.0	0.0	0.0	2536
Glyfos + Int Exp 113	1.0 13.33 lb/100 gal	6 LF								
Glyfos + Surf King <i>fb</i>	1.0 0.5%	COT.- 1 LF	11.3	20.0	11.3	8.8	5.0	7.5	8.8	2694
Glyfos + Surf King	1.0 0.5%	4 LF								
Glyfos + Surf King <i>fb</i>	1.0 0.5%	COT.- 1 LF	11.3	16.3	10.0	1.3	3.8	1.3	1.3	2418
Glyfos + Surf King	1.0 0.5%	6 LF								
Glyfos + LI 700 <i>fb</i>	1.0 0.5%	COT.- 1 LF	2.5	5.0	2.5	0.0	0.0	0.0	0.0	2644
Glyfos + LI 700	1.0 0.5%	4 LF								
Glyfos + LI 700 <i>fb</i>	1.0 0.5%	COT.- 1 LF	1.3	2.5	1.3	0.0	0.0	0.0	0.0	2507
Glyfos + LI 700	1.0 0.5%	6 LF								
Glyfos + Intensify <i>fb</i>	1.0 0.5%	COT.- 1 LF	10.0	12.5	7.5	6.3	3.8	8.8	6.3	2767
Glyfos + Intensify	1.0 0.5%	4 LF								
Glyfos + Intensify <i>fb</i>	1.0 0.5%	COT.- 1 LF	10.0	13.8	1.3	1.3	0.0	0.0	1.3	2581
Glyfos + Intensify	1.0 0.5%	6 LF								
Glyfos + JS 80:20 <i>fb</i>	1.0 0.5%	COT.- 1 LF	7.5	6.3	2.5	2.5	0.0	5.0	2.5	2571
Glyfos + JS 80:20	1.0 0.5%	4 LF								
Glyfos + JS 80:20 <i>fb</i>	1.0 0.5%	COT.- 1 LF	7.5	10.0	1.3	0.0	0.0	1.3	0.0	2384
Glyfos + JS 80:20	1.0 0.5%	6 LF								
Glyfos X-tra <i>fb</i>	1.0	COT.- 1 LF	3.8	2.5	1.3	2.5	1.3	0.0	2.5	2728
Glyfos X-tra	1.0	4 LF								
Glyfos X-tra <i>fb</i>	1.0	COT.- 1 LF	5.0	3.8	1.3	2.5	0.0	3.8	2.5	2413
Glyfos X-tra	1.0	6 LF								
Roundup Ultra <i>fb</i>	1.0	COT.- 1 LF	6.3	6.3	1.3	2.5	0.0	0.0	2.5	2644
Roundup Ultra	1.0	4 LF								
Roundup Ultra <i>fb</i>	1.0	COT.- 1 LF	5.0	5.0	2.5	0.0	0.0	0.0	0.0	2345
Roundup Ultra	1.0	6 LF								
LSD (0.05)			3.5	4.6	4.4	4.0	3.1	5.4	4.0	381

^z General injury ratings taken 6/22, 7/2, and 7/16 were all zero.

^y Stunting ratings taken 6/9 were all zero.

Table 10. Cloransulam (FirstRate) and cloransulam + flumetsulam (Frontrow) post-directed on Roundup Ready cotton, Marianna, 2000.

TEST INFORMATION	
Location	Marianna
Experimental design / replications	RCB / 4
Plot size	12.7 ft x 30 ft
Row width / Number of rows per plot	38 in. / 4
Crop / Cultivar	cotton / Stoneville BT/RR
Seeding rate	12 lb/acre
Planting date / Harvest date	May 11, 2000 /
Soil type	silt loam (2% sand, 86% silt, 12% clay)
% OM / pH	1.1 / 5.7

Comments: PPI = preplant incorporated; EOT = early over-the-top at 2- to 3-lf cotton; LOT = late over-the-top at 4-lf cotton; DIR = post-directed at 10-lf cotton. Herbicide information can be found in Appendix Table 1.

Application

Type	PPI	EOT	LOT	DIR
Date applied	May 11, 2000	May 30, 2000	June 7, 2000	June 27, 2000
Time	3:00 pm	4:00 pm	5:00 pm	4:00 pm
Incorporation equipment	Triple K	N/A	N/A	N/A
Air/Soil temperature (F)	80 / 71	89 / 75	87 / 75	88 / 85
Wind (mph)	8	4	5	4
Cloud cover (%)	40	0	0	30
Soil moisture	adequate	adequate	adequate	adequate
Crop stage/height	N/A	2-3 lf	4 lf	10 lf / 17"
Sprayer type/mph	Tractor / 5	Tractor / 3.5	Tractor / 3.5	Tractor / 4.2
Nozzle type/size	Flat fan / 8003	Flat fan / 8003	Flat fan / 11003	Flat Fan / 11002
Boom ht / # Noz / Spacing (in.)	19 / 8 / 19	19 / 8 / 19	19 / 8 / 19	3 / 8 / 19
Gpa / Psi	15 /	20 / 28	20 / 27	15 / 22
Weed species (density)	----- (number of leaves) -----			
SIDSP* (3/ft ²)	cot. - 2 lf	cot. - 3 lf	cot. - 4 lf	cot. - 5 lf
IPOLA (2/ft ²)	cot. - 4 lf	cot. - 5 lf	cot. - 6 lf	cot. - 6 lf
AMASS (5/ft ²)	cot. - 2 lf	cot. - 6 lf	cot. - 7 lf	cot. - 4 lf
IPOHG (2/ft ²)	cot. - 4 lf	cot. - 5 lf	cot. - 6 lf	cot. - 6 lf
GGGAN				1-4 lf

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: All LOT treatments with glyphosate and cloransulam or cloransulam + flumetsulam controlled pigweed species 98% at 2 weeks after the LOT application (June 20). Adding cloransulam to glyphosate increased pigweed control from the EOT application over control with glyphosate alone (98 and 91%, respectively) at 3 weeks after the EOT application. However, later in the season, control tended to be better with sequential glyphosate applications (EOT *fb* DIR) than with the single EOT cloransulam mixture. DIR applications of either cloransulam or cloransulam + flumetsulam, alone or with glyphosate, were needed to maintain control of pigweed >85% until mid-September. Glyphosate or MSMA DIR were needed to maintain control of goosegrass. Cloransulam and cloransulam + flumetsulam significantly increased control of morningglory species over control with glyphosate alone (86% and 69%, respectively, at 3 weeks after DIR applications). LOT and DIR treatments of cloransulam + flumetsulam injured cotton 21 to 31% at 4 weeks after LOT treatments (3 weeks after DIR). Injury was much higher at 4 weeks than at 2 weeks after treatment, and injury from the high rate (0.0375 + 0.015 lb/A) DIR or the lower rate (0.019 + 0.0075 lb/A) LOT persisted (21% in September). Injury was manifested as leaf discoloration and curling.

Table 10. Section 1.

Herbicide	Rate (lb ai/A)	Application timing	Weed control						
			Palmer amaranth and smooth pigweed (AMASS)				Goosegrass (ELEIN)		Carpetweed (MOLVE)
			6/6	6/20	7/18	9/6	7/18	9/6	6/20
			----- % -----						
NOTE: Formulations of glyphosate used are indicated as: GP = Glyphomax Plus; and RU = Roundup Ready. Glyphomax (glyphosate without surfactant) is used for only one treatment and is indicated as such.									
Untreated			0	0	0	0	0	0	0
Trifluralin (Treflan) <i>fb</i>	0.75	PPI		96	75	71	71	71	100
glyphosate (Glyphomax Plus)	0.75	LOT							
Trifluralin <i>fb</i>	0.75	PPI		99	80	71	81	73	100
glyphosate (GP) <i>fb</i>	0.75	LOT							
cloransulam (FirstRate)	0.019								
+ Agri-Dex	1.2%	DIR							
Trifluralin <i>fb</i>	0.75	PPI		100	79	91	93	94	100
glyphosate (GP) <i>fb</i>	0.75	LOT							
cloransulam +	0.019								
MSMA +	2.0								
Agri-Dex	1.2%	DIR							
Trifluralin <i>fb</i>	0.75	PPI		99	94	97	95	99	100
glyphosate (GP) <i>fb</i>	0.75	LOT							
cloransulam +	0.019								
glyphosate (RU)	0.75	DIR							
Trifluralin <i>fb</i>	0.75	PPI		99	85	85	88	86	100
glyphosate (GP) <i>fb</i>	0.75	LOT							
[cloransulam +	0.019								
flumetsulam (Frontrow)]	0.0075								
+ Agri-Dex	1.2%	DIR							
Trifluralin <i>fb</i>	0.75	PPI		100	89	85	75	63	100
glyphosate (Glyphomax)	0.75	LOT							
<i>fb</i> [cloransulam +	0.0375								
flumetsulam] +	0.015								
Agri-Dex	1.2%	DIR							
Trifluralin <i>fb</i>	0.75	PPI		100	95	100	95	98	100
glyphosate (GP) <i>fb</i>	0.75	LOT							
[cloransulam +	0.019								
flumetsulam] +	0.0075								
glyphosate (GP)	0.75	DIR							
Trifluralin <i>fb</i>	0.75	PPI		100	95	99	95	98	100
glyphosate (GP) <i>fb</i>	0.75	LOT							
prometryn (Caparol) +	0.75								
MSMA +	2.0								
AG-98	0.5%	DIR							
Glyphosate (GP) +	0.75		96	98	75	85	58	38	100
cloransulam	0.019	EOT							
Glyphosate (GP) <i>fb</i>	0.75	EOT	96	91	95	98	95	97	100
glyphosate (GP) +	0.75								
Agri-Dex	1.2%	DIR							
LSD (0.05)			1	6	17	20	13	24	1

continued

Table 10. Section 2.

Herbicide	Rate (lb ai/A)	Application timing	Weed control							
			Pitted and entireleaf morningglory (IPOSS)				Prickly sida (SIDSP)			
			6/6	6/20	7/18	9/6	6/6	6/20	7/18	9/6
			----- % -----							
NOTE: Formulations of glyphosate used are indicated as: GP = Glyphomax Plus; and RU = Roundup Ready. Glyphomax (glyphosate without surfactant) is used for only one treatment and is indicated as such.										
Untreated			2	0	0	0	0	0	0	0
Trifluralin (Treflan) <i>fb</i> glyphosate (Glyphomax Plus)	0.75	PPI		83	69	60		89	63	38
Trifluralin <i>fb</i> glyphosate (GP) <i>fb</i>	0.75	PPI		88	95	90		88	66	43
cloransulam (FirstRate) + Agri-Dex	0.019 1.2%	LOT DIR								
Trifluralin <i>fb</i> glyphosate (GP) <i>fb</i> cloransulam + MSMA + Agri-Dex	0.75 0.75 0.019 2.0 1.2%	PPI LOT DIR		89	90	93		91	71	69
Trifluralin <i>fb</i> glyphosate (GP) <i>fb</i> cloransulam + glyphosate (RU)	0.75 0.75 0.019 0.75	PPI LOT DIR		86	94	99		89	95	98
Trifluralin <i>fb</i> glyphosate (GP) <i>fb</i> [cloransulam + flumetsulam (Frontrow)] + Agri-Dex	0.75 0.75 0.019 0.0075 1.2%	PPI LOT DIR		85	86	86		89	81	71
Trifluralin <i>fb</i> glyphosate (Glyphomax) <i>fb</i> [cloransulam + flumetsulam] + Agri-Dex	0.75 0.75 0.0375 0.015 1.2%	PPI LOT DIR		81	86	89		89	94	88
Trifluralin <i>fb</i> glyphosate (GP) <i>fb</i> [cloransulam + flumetsulam] + glyphosate (GP)	0.75 0.75 0.019 0.0075 0.75	PPI LOT DIR		78	86	97		91	95	97
Trifluralin <i>fb</i> glyphosate (GP) <i>fb</i> prometryn (Caparol) + MSMA + AG-98	0.75 0.75 0.75 2.0 0.5%	PPI LOT DIR		83	95	99		93	89	98
Glyphosate (GP) + cloransulam	0.75 0.019	EOT	66	93	95	89	74	93	93	89
Glyphosate (GP) <i>fb</i> glyphosate (GP) + Agri-Dex	0.75 0.75 1.2%	EOT DIR	55	70	83	99	56	73	95	97
LSD (0.05)			12	11	12	18	12	13	9	20

continued

Table 10. Section 3.

Herbicide	Rate (lb ai/A)	Application timing	Weed control		Cotton injury				
			Large crabgrass (DIGSA)	Fall panicum (PANDI)	6/6	6/20	7/5	7/18	9/6
			7/18	7/18	----- % -----				
Untreated		0	0	0	0	0	0	0	0
Trifluralin (Treflan) <i>fb</i> glyphosate (Glyphomax Plus)	0.75 0.75	PPI LOT	95	95		3	0	0	0
Trifluralin <i>fb</i> glyphosate (GP) <i>fb</i>	0.75 0.75	PPI LOT	95	95		9	3	0	0
cloransulam (FirstRate) + Agri-Dex	0.019 1.2%	DIR							
Trifluralin <i>fb</i> glyphosate (GP) <i>fb</i>	0.75 0.75	PPI LOT	95	95		1	11	0	3
cloransulam + MSMA + Agri-Dex	0.019 2.0 1.2%	DIR							
Trifluralin <i>fb</i> glyphosate (GP) <i>fb</i>	0.75 0.75	PPI LOT	95	95		0	3	0	0
cloransulam + glyphosate (RU)	0.019 0.75	DIR							
Trifluralin <i>fb</i> glyphosate (GP) <i>fb</i>	0.75 0.75	PPI LOT	95	95		4	21	10	6
[cloransulam + flumetsulam (Frontrow)] + Agri-Dex	0.019 0.0075 1.2%	DIR							
Trifluralin <i>fb</i> glyphosate (Glyphomax) <i>fb</i>	0.75 0.75	PPI LOT	95	95		4	31	43	21
[cloransulam + flumetsulam] + Agri-Dex	0.0375 0.015 1.2%	DIR							
Trifluralin <i>fb</i> glyphosate (GP) <i>fb</i>	0.75 0.75	PPI LOT	95	95		0	28	31	21
[cloransulam + flumetsulam] + glyphosate (GP)	0.019 0.0075 0.75	DIR							
Trifluralin <i>fb</i> glyphosate (GP) <i>fb</i>	0.75 0.75	PPI LOT	95	95		6	9	8	8
prometryn (Caparol) + MSMA + AG-98	0.75 2.0 0.5%	DIR							
Glyphosate (GP) + cloransulam	0.75 0.019	EOT	95	95	20	16	4	4	6
Glyphosate (GP) <i>fb</i> glyphosate (GP) + Agri-Dex	0.75 0.75 1.2%	EOT DIR	95	95	0	0	4	4	0
LSD (0.05)			1	1	1	6	10	11	9

Table 11. Prometryn (Caparol) preemergence in glyphosate-tolerant cotton, Rohwer, 2000.

TEST INFORMATION

Location	Rohwer	Crop / Cultivar	cotton / DP 451 B/RR
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 35 ft	Planting date / Harvest date	May 17, 2000 / N/A
Row width / Number of rows per plot	38 in. / 4	Soil type	silt loam (16% sand, 67% silt, 17% clay)
		% OM / pH	1.1 / 7.1

Comments: PRE = preemergence; 3-4 LF = 3- to 4-leaf cotton; and 6-8 LF = 6- to 8-leaf cotton. Herbicide information can be found in Appendix Table 1.

Application

	PRE	3-4 LF	6-8 LF
Type			
Date applied	May 18, 2000	June 13, 2000	June 22, 2000
Time	7:30 am	8:00 am	3:00 pm
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	75 / 70	85 / 81	86 / 75
Relative humidity (%)	73	64	64
Wind (mph)	8	2	4
Cloud cover (%)	80	50	0
Soil moisture	optimal	optimal	dry
Crop stage/height	N/A	3-4 lf / 6"	6-8 lf / 10"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	Tractor / 4
Nozzle type/size	Flat fan / 8002VS	Flat fan / 8002VS	off-center / 0C02
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19	22 / 8 / 19
Gpa / Psi	15 / 22	15 / 22	15 / 18
Weed species (density)	-----	[height (in.)] -----	-----
ECHCG* (light)		5"	12"
IPOLA (light)		5"	12"
SIDSP (light)		5"	8"

*See Appendix Table 3 for definition of Bayer codes.

Conclusions: Prometryn (Caparol) was applied PRE at rates ranging from 0.5 to 2.25 lb ai/A and followed by glyphosate (Roundup Ultra) at the 3- to 4-leaf or 6- to 8-leaf cotton stage. Control of barnyardgrass, pitted morningglory, and prickly sida was evaluated. Prometryn at 0.5 to 1 lb ai/A followed by glyphosate at the 6- to 8-leaf stage did not provide acceptable control of any species at 42 DAT; however, when the rate of prometryn was increased to 1.5 and 2.25 lb ai/A followed by glyphosate, control was increased to greater than 85%. Control of all species was increased to greater than 95% when prometryn was followed by applications of glyphosate at the 3- to 4-leaf stage followed by 6- to 8-leaf applications.

Table 11.

Herbicide	Rate (lb ai/A)	Application timing	Weed control					
			Barnyardgrass (ECHCG)		Pitted morningglory (IPOLA)		Prickly sida (SIDSP)	
			6/29	8/24	6/29	8/24	6/29	8/24
Untreated check			0	0	0	0	0	0
Prometryn (Caparol) <i>fb</i>	0.5	PRE	69	58	70	85	72	88
glyphosate (Roundup Ultra)	0.75	6-8 LF						
Prometryn <i>fb</i>	0.75	PRE	65	69	69	80	69	85
glyphosate	0.75	6-8 LF						
Prometryn <i>fb</i>	1.0	PRE	73	89	79	76	85	85
glyphosate	0.75	6-8 LF						
Prometryn <i>fb</i>	1.5	PRE	85	56	83	85	90	89
glyphosate	0.75	6-8 LF						
Prometryn <i>fb</i>	2.25	PRE	85	61	89	53	95	81
glyphosate	0.75	6-8 LF						
Prometryn <i>fb</i>	0.75	PRE	100	91	96	65	100	88
glyphosate <i>fb</i>	0.75	3-4LF						
glyphosate	0.75	6-8 LF						
Fluometuron (Cotoran) <i>fb</i>	0.75	PRE	99	91	97	84	99	91
glyphosate <i>fb</i>	0.75	3-4LF						
glyphosate	0.75	6-8 LF						
Glyphosate <i>fb</i>	0.75	3-4LF	100	91	91	86	99	91
glyphosate	0.75	6-8 LF						
Prometryn <i>fb</i>	0.75	PRE	100	99	98	97	100	96
glyphosate <i>fb</i>	0.75	3-4LF						
glyphosate + prometryn	0.75	6-8 LF						
LSD (0.05)			14	9	18	10	18	5

Table 12. Fomesafen (Reflex) tank mix in cotton, Marianna, 2000.

TEST INFORMATION

Location	Marianna	Crop / Cultivar	cotton / BXN 47
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 30 ft	Planting date	May 11, 2000
Row width / Number of rows per plot	38 in. / 4	Soil type	silt loam (2% sand, 86% silt, 12% clay)
		% OM / pH	1.1 / 5.7

Comments: PPI = preplant incorporated; PRE = preemergence; and OT = over-the-top. Herbicide information can be found in Appendix Table 1.

Application

Type	PPI	PRE	OT
Date applied	May 11, 2000	May 12, 2000	June 7, 2000
Time	4:00 pm	6:00 pm	3:00 pm
Incorporation equipment	N/A	N/A	N/A
Air/soil temperature (F)	80	85	87 / 83
Wind (mph)	8	10	6
Cloud cover (%)	40	0	0
Soil moisture	adequate	adequate	adequate
Sprayer type/mph	Tractor / 5	Tractor / 3.5	Tractor / 3.5
Nozzle type/size	Flat fan /	Flat fan / 8003	Flat fan / 11003
Boom ht / # Noz / Spacing (in.)	19 / 8 / 19	19 / 8 / 19	19 / 8 / 19
Gpa / Psi	15 /	20 / 28	20 / 27
Weed species (density)	----- (number of leaves) -----		
AMACH* (3/ft ²)			cot. - 7 lf
SIDSP (1/ft ²)			cot. - 3 lf
IPOSS (3/ft ²)			cot. - 5 lf
MOLVE (2/ft ²)			cot. - 2 lf
GGGAN (3/ft ²)			1-4 lf

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: Fomesafen (Reflex) was more active this year than in some other years of testing. Fomesafen PRE following trifluralin PPI significantly increased control of all species over control with trifluralin alone at 3 and 5 weeks after treatment (WAT) and did not differ from control with trifluralin PPI *fb* fluometuron PRE. There was no rate response from fomesafen at 0.25 or 0.375 lb/A when combined with fluometuron. However, fomesafen at 0.25 lb/A with pyrithiobac was weaker than 0.375 lb/A on prickly sida, smooth pigweed, and morningglory species. Although cotton injury was moderate (16 to 38%) from all treatments early in the season, injury from fomesafen exceeded that from fluometuron, and injury from 0.375 lb/A was greater than from 0.25 lb/A. Injury manifested primarily as stunting.

Table 12. Section 1.

Herbicide	Rate (lb ai/A)	Application timing	Weed control					
			Prickly sida (SIDSP)		Smooth pigweed (AMACH)		Pitted and entireleaf morningglory (IPOSS)	
			6/6	6/20	6/6	6/20	6/6	6/20
			----- % -----					
Untreated			0	0	0	0	0	0
Trifluralin (Treflan)	0.75	PPI	26	6	87	94	51	37
Trifluralin <i>fb</i> fomesafen (Reflex)	0.75 0.375	PPI PRE	100	99	100	100	90	81
Trifluralin <i>fb</i> fluometuron (Meturon)	0.75 1.5	PPI PRE	100	98	100	100	89	91
Trifluralin <i>fb</i> fomesafen + fluometuron	0.75 0.25 1.5	PPI PRE	100	100	100	100	90	90
Trifluralin <i>fb</i> fomesafen + fluometuron	0.75 0.375 1.5	PPI PRE	100	98	100	100	90	94
Trifluralin <i>fb</i> pyrithiobac (Staple)	0.75 0.047	PPI PRE	98	97	100	99	85	81
Trifluralin <i>fb</i> fomesafen + pyrithiobac	0.75 0.25 0.047	PPI PRE	74	65	93	93	73	54
Trifluralin <i>fb</i> fomesafen + pyrithiobac	0.75 0.375 0.047	PPI PRE	100	99	100	100	94	93
Trifluralin <i>fb</i> bromoxynil (Buctril)	0.75 0.375	PPI OT	13	93	94	100	30	93
LSD (0.05)			10	12	5	3	11	14

continued

Table 12. Section 2.

Herbicide	Rate (lb ai/A)	Application timing	Weed control						
			Carpetweed (SIDSP)		Barnyardgrass and goosegrass (AMACH)		Cotton injury		
			6/6	6/20	6/6	6/20	6/6	6/20	6/28
Untreated			0	0	0	0	0	0	0
Trifluralin (Treflan)	0.75	PPI	79	80	91	92	16	11	N/A ^z
Trifluralin <i>fb</i>	0.75	PPI	100	100	100	100	33	16	16
fomesafen (Reflex)	0.375	PRE							
Trifluralin <i>fb</i>	0.75	PPI	100	100	100	100	16	10	10
fluometuron (Meturon)	1.5	PRE							
Trifluralin <i>fb</i>	0.75	PPI	100	100	100	100	24	18	18
fomesafen + fluometuron	0.25 1.5	PRE							
Trifluralin <i>fb</i>	0.75	PPI	100	100	100	100	31	19	19
fomesafen + fluometuron	0.375 1.5	PRE							
Trifluralin <i>fb</i>	0.75	PPI	100	100	100	100	20	10	10
pyrithiobac (Staple)	0.047	PRE							
Trifluralin <i>fb</i>	0.75	PPI	84	95	95	94	24	4	4
fomesafen + pyrithiobac	0.25 0.047	PRE							
Trifluralin <i>fb</i>	0.75	PPI	100	100	75	99	38	24	24
fomesafen + pyrithiobac	0.375 0.047	PRE							
Trifluralin <i>fb</i>	0.75	PPI	78	100	96	92	16	4	4
bromoxynil (Buctril)	0.375	OT							
LSD (0.05)			13	9	19	4	7	7	8

^z N/A = data not available.

Table 13. Fomesafen (Reflex) preemergence tank mixtures, Rohwer, 2000.

TEST INFORMATION

Location	Rohwer	Crop / Cultivar	cotton / DP 454 B/RR
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 35 ft	Planting date / Harvest date	May 25, 2000 / Oct. 12, 2000
Row width / Number of rows per plot	38 in. / 4	Soil type	silt loam (16% sand, 67% silt, 17% clay)
		% OM / pH	1.1 / 7.1

Comments: PPI = preplant incorporated; PRE = preemergence; and 6-8 LF = 6- to 8-leaf cotton. Herbicide information can be found in Appendix Table 1.

Application

Type	PPI	PRE	6-8 LF
Date applied	May 25, 2000	May 26, 2000	June 26, 2000
Time	7:00 am	7:00 am	9:00 am
Incorporation equipment	Levelband	N/A	N/A
Air/Soil temperature (F)	80 / 76	78 / 77	85 / 76
Relative humidity (%)	85	86	86
Wind (mph)	2	6	4
Cloud cover (%)	100	50	20
Soil moisture	optimal	optimal	optimal
Crop stage/height	N/A	N/A	18"
Sprayer type/mph	Tractor / 4	BkPkCO ₂ / 3	Tractor / 4
Nozzle type/size	Flat fan / 8002VS	Flat fan / 8002VS	0C02
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19	22 / 8 / 19
Gpa / Psi	15 / 22	15 / 22	15 / 18
Weed species (density)	----- [height (in.)] -----		
IPOLA* (heavy)	8"		
SIDSP (heavy)	6"		
AMARE (heavy)	12"		

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: Fomesafen at 0.25 to 0.5 lb ai/A PRE following trifluralin PPI increased control of redroot pigweed, pitted morningglory, and prickly sida over trifluralin alone. When fomesafen PRE was added to fluometuron following trifluralin PPI or pyriothiac PRE following trifluralin PPI, there was no increase in weed control or yield compared to the same herbicide combinations without fomesafen. Injury levels of 15 to 30% were common among the treatments containing fomesafen.

Table 13.

Herbicide	Rate (lb ai/A)	Application timing	Weed control			Effect on cotton	
			Redroot pigweed (AMARE)	Pitted morningglory (IPOLA)	Prickly sida (SIDSP)	Injury	Yield
			6/29	6/29	6/29	6/29	10/12
Untreated check			0	0	0	0	0
Trifluralin (Treflan)	0.75	PPI	71	68	38	0	742
Trifluralin <i>fb</i> fomesafen (Reflex)	0.75 0.375	PPI PRE	100	86	100	21	2423
Trifluralin <i>fb</i> fluometuron (Cotoran)	0.75 1.5	PPI PRE	100	99	100	0	2659
Trifluralin <i>fb</i> fomesafen + fluometuron	0.75 0.25 1.5	PPI PRE	100	98	100	16	2821
Trifluralin <i>fb</i> fomesafen + fluometuron	0.75 0.375 1.5	PPI PRE	100	100	100	28	3044
Trifluralin <i>fb</i> pyrithiobac (Staple)	0.75 0.047	PPI PRE	100	90	100	4	2959
Trifluralin <i>fb</i> fomesafen + pyrithiobac	0.75 0.25 0.047	PPI PRE	100	94	100	18	2935
Trifluralin <i>fb</i> fomesafen + pyrithiobac	0.75 0.375 0.047	PPI PRE	100	71	100	30	2374
Trifluralin <i>fb</i> fomesafen + MSMA	0.75 0.25 2.0	PPI 6-8 LF	70	61	40	0	2207
Trifluralin <i>fb</i> fluometuron <i>fb</i> fomesafen + MSMA	0.75 1.5 0.25 2.0	PPI PRE 6-8 LF	100	99	100	5	2733
Trifluralin <i>fb</i> fomesafen + MSMA	0.75 0.375 2.0	PPI 6-8 LF	75	69	35	0	1725
Trifluralin <i>fb</i> fomesafen	0.75 0.5	PPI PRE	100	95	98	30	1942
LSD (0.05)			14	28	16	13	763

Table 14. CGA-362622 in cotton, Fayetteville, 2000.

TEST INFORMATION

Location	Fayetteville	Crop / Cultivar	cotton / DPL 451BR
Experimental design / replications	RCB / 4	Seeding rate	4 / ft
Plot size	3.3 ft x 27 ft	Planting date / Harvest date	May 22, 2000 / N/A
Row width / Number of rows per plot	40 in. / 1	Soil type	Taloka silt loam (21 sand, 68% silt, 11% clay)
		% OM / pH	1.1 / 5.7

Comments: Each plot is 12 ft weedy and 12 ft weedfree with a 3-ft alley. PRE = preemergence; OT = over-the-top of cotton at 1-lf (3-in.); EDIR = early directed at 4-lf (6- to 7-in.); LDIR = late directed at 8- to 9-nodes (15-in.). Weed sizes at EDIR and LDIR from plots with prior treatments. Herbicide information can be found in Appendix Table 1.

Application

Type	PRE	OT	EDIR	LDIR
Date applied	May 22, 2000	June 6, 2000	June 22, 2000	July 6, 2000
Time	6:30 pm	4:00 pm	4:30 pm	10:30 am
Incorporation equipment	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	77 / 77	79 / 84	88 / 86	85 / 86
Relative humidity (%)	80	65	80	65
Wind (mph)	4	2	3	3
Cloud cover (%)	20	0	90	0
Soil moisture	moist	moist	wet	moist
Crop stage/height	N/A	1 lf / 2.5-3 in.	4 lf / 6-7 in.	8-9 node / 15 in.
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/size	Flat fan / XR8002VS	Flat Fan / XR8002VS	Flat fan / OC01	Flat fan / OC01
Boom ht / # Noz / Spacing (in.)	20 / 2 / 18	21 / 2 / 18	6 / 2 / 18	6 / 2 / 18
Gpa / Psi	15 / 24	15 / 26	15 / 24	15 / 26
Weed species (density)	----- [no. of leaves / height (cm.)] -----			
DIGSA* (3/ft ²)		1-2 lf / >1 cm	7 lf / 5 cm	2-9 lf / 2-12 cm
AMACH (1/ft ²)		cot.-2 lf / 0.5-1 cm	4-9 lf / 3-6 cm	7-9 lf / 6-10 cm
AMAPA (1/ft ²)		cot - 2 lf / 0.5 cm	4-9 lf / 3-6 cm	7 lf / 3 cm
IPOLA (4/ft ²)		1-2 lf / 3 cm	5-14 lf / 8-20 cm	4-8 lf / 5-15 cm
SEBEX (4/ft ²)		1-2 compd. / 2-3.5 cm	7 lf / 13-15 cm	2 lf / 5 cm
ABUTH (3/ft ²)		2 lf / 2 cm	N/A	7 lf / 18 cm
SIDSP (2/ft ²)		1-2 lf / 0.5 cm	2-5 lf / 3-5 cm	4 lf / 2-4 cm

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: CGA-362622 was weak on large crabgrass, but tended to be slightly more active than pyriithiobac on that species. CGA-362622 continues to give excellent control of pigweed species with both PRE and POST applications. As in 1999, control of pitted morningglory with POST applications was good (80 to 95%), although regrowth occurred by 5 to 6 weeks after application. Control of prickly sida was very poor. Cotton was injured 30 to 41% by CGA-362622 PRE until late July, when it declined to 13% (still the highest injury in the experiment).

Table 14. Section 1.

Herbicide	Rate (lb ai/A)	Application timing	Weed control									
			Large crabgrass (DIGSA)	Smooth pigweed (AMACH)				Palmar amaranth (AMAPA)				
			7/12	6/13	6/29	7/12	7/26	6/13	6/29	7/12	7/26	
Untreated check			0	0	0	0	0	0	0	0	0	0
Pendimethalin	0.75	PRE	70	86	89	90	62	86	89	90	60	
CGA-362622	0.007	PRE	70	98	100	98	99	100	100	98	99	
Pendimethalin <i>fb</i> CGA-362622 + AG-98	0.75 0.0047 0.25%	PRE OT	94	100	100	100	100	100	100	100	100	
Pendimethalin <i>fb</i> CGA-362622 + AG-98	0.75 0.007 0.25%	PRE OT	94	100	100	100	100	100	100	100	100	
Pendimethalin <i>fb</i> pyrithiobac (Staple) + AG-98	0.75 0.063 0.25%	PRE OT	71	99	100	100	100	100	100	100	100	
Pendimethalin <i>fb</i> glyphosate	0.75 0.75	PRE OT	95	100	100	100	98	100	100	100	98	
Pendimethalin <i>fb</i> CGA-362622 + AG-98	0.75 0.007 0.25%	PRE EDIR EDIR	83		93	100	100		86	100	100	
Pendimethalin <i>fb</i> CGA-362622 + AG-98	0.75 0.0094 0.25%	PRE EDIR EDIR	81		83	100	96		80	98	100	
Pendimethalin <i>fb</i> pyrithiobac + AG-98	0.75 0.063 0.25%	PRE EDIR EDIR	61		86	100	100		85	100	100	
Pendimethalin <i>fb</i> glyphosate	0.75 0.75	PRE EDIR	100		98	100	100		97	99	100	
Pendimethalin <i>fb</i> fluometuron + MSMA	0.75 1 1.5	PRE EDIR EDIR	89		88	80	90		84	80	91	
Pendimethalin + fluometuron <i>fb</i> CGA-362622 + AG-98	0.75 0.9 0.007 0.25%	PRE PRE LDIR LDIR	100			100	100			100	100	
Pendimethalin + fluometuron <i>fb</i> CGA-362622 + AG-98	0.75 0.9 0.0094 0.25%	PRE PRE LDIR LDIR	100			100	100			100	100	
Pendimethalin + fluometuron <i>fb</i> pyrithiobac + AG-98	0.75 0.9 0.063 0.25%	PRE PRE LDIR LDIR	100			100	100			100	100	
Pendimethalin + fluometuron <i>fb</i> glyphosate	0.75 0.9 0.75	PRE PRE LDIR	100			100	100			100	100	
LSD (0.05)			15	5	10	11	18		5	12	12	17

continued

Table 14. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Pitted morningglory (IPOLA)				Hemp sesbania (SEBEX)				
			6/13	6/29	7/12	7/26	6/13	6/29	7/12	7/26	
Untreated check			0	0	0	0	0	0	0	0	0
Pendimethalin	0.75	PRE	44	42	20	8	60	44	65	44	44
CGA-362622	0.007	PRE	69	55	53	8	74	64	50	35	35
Pendimethalin <i>fb</i> CGA-362622 + AG-98	0.75 0.0047 0.25%	PRE OT	70	97	95	80	99	99	100	97	97
Pendimethalin <i>fb</i> CGA-362622 + AG-98	0.75 0.007 0.25%	PRE OT	79	98	95	88	98	100	100	100	100
Pendimethalin <i>fb</i> pyrithiobac (Staple) + AG-98	0.75 0.063 0.25%	PRE OT	60	95	92	79	99	97	100	100	100
Pendimethalin <i>fb</i> glyphosate	0.75 0.75	PRE OT	58	72	63	49	99	92	91	91	91
Pendimethalin <i>fb</i> CGA-362622 + AG-98	0.75 0.007 0.25%	PRE EDIR EDIR		71	95	83		78	90	80	80
Pendimethalin <i>fb</i> CGA-362622 + AG-98	0.75 0.0094 0.25%	PRE EDIR EDIR		58	80	73		66	79	75	75
Pendimethalin <i>fb</i> pyrithiobac + AG-98	0.75 0.063 0.25%	PRE EDIR EDIR		53	77	73		70	92	93	93
Pendimethalin <i>fb</i> glyphosate	0.75 0.75	PRE EDIR		69	90	84		73	81	84	84
Pendimethalin <i>fb</i> fluometuron + MSMA	0.75 1 1.5	PRE EDIR EDIR		63	66	58		73	83	76	76
Pendimethalin + fluometuron <i>fb</i> CGA-362622 + AG-98	0.75 0.9 0.007 0.25%	PRE PRE LDIR LDIR			94	98			100	100	100
Pendimethalin + fluometuron <i>fb</i> CGA-362622 + AG-98	0.75 0.9 0.0094 0.25%	PRE PRE LDIR LDIR			96	98			100	100	100
Pendimethalin + fluometuron <i>fb</i> pyrithiobac + AG-98	0.75 0.9 0.063 0.25%	PRE PRE LDIR LDIR			93	95			99	98	98
Pendimethalin + fluometuron <i>fb</i> glyphosate	0.75 0.9 0.75	PRE PRE LDIR			94	95			100	100	100
LSD (0.05)			19	17	14	13	10	19	14	21	21

continued

Table 14. Section 3.

Herbicide	Rate (lb/A)	Application timing	Prickly sida (SIDSP) control				Cotton injury			
			6/13	6/29	7/12	7/26	6/13	6/29	7/12	7/26
Untreated check			0	0	0	0	0	0	0	0
Pendimethalin	0.75	PRE	50	32	23	15	0	0	0	0
CGA-362622	0.007	PRE	81	38	10	0	30	41	35	13
Pendimethalin <i>fb</i> CGA-362622 + AG-98	0.75 0.0047 0.25%	PRE OT	90	70	51	31	8	9	4	0
Pendimethalin <i>fb</i> CGA-362622 + AG-98	0.75 0.007 0.25%	PRE OT	97	73	33	45	8	18	14	4
Pendimethalin <i>fb</i> pyrithiobac (Staple) + AG-98	0.75 0.063 0.25%	PRE OT	100	98	100	92	3	9	3	0
Pendimethalin <i>fb</i> glyphosate	0.75 0.75	PRE OT	100	88	62	92	0	0	0	0
Pendimethalin <i>fb</i> CGA-362622 + AG-98	0.75 0.007 0.25%	PRE EDIR EDIR		53	41	31		5	0	0
Pendimethalin <i>fb</i> CGA-362622 + AG-98	0.75 0.0094 0.25%	PRE EDIR EDIR		31	31	40		9	11	4
Pendimethalin <i>fb</i> pyrithiobac + AG-98	0.75 0.063 0.25%	PRE EDIR EDIR		65	83	53		6	0	0
Pendimethalin <i>fb</i> glyphosate	0.75 0.75	PRE EDIR		82	94	97		8	0	0
Pendimethalin <i>fb</i> fluometuron + MSMA	0.75 1 1.5	PRE EDIR EDIR		49	58	49		14	1	0
Pendimethalin + fluometuron <i>fb</i> CGA-362622 + AG-98	0.75 0.9 0.007 0.25%	PRE PRE LDIR LDIR			98	100			0	0
Pendimethalin + fluometuron <i>fb</i> CGA-362622 + AG-98	0.75 0.9 0.0094 0.25%	PRE PRE LDIR LDIR			95	91			3	0
Pendimethalin + fluometuron <i>fb</i> pyrithiobac + AG-98	0.75 0.9 0.063 0.25%	PRE PRE LDIR LDIR			100	100			4	0
Pendimethalin + fluometuron <i>fb</i> glyphosate	0.75 0.9 0.75	PRE PRE LDIR			100	100			0	0
LSD (0.05)			14	22	20	21	10	11	9	5

Table 15. CGA-362622 rates and timings, Rohwer, 2000.

TEST INFORMATION

Location	Rohwer	Crop / Cultivar	cotton / DP 451B/RR
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 40 ft	Planting date / Harvest date	May 17, 2000 / N/A
Row width / Number of rows per plot	38 in. / 4	Soil type ... Hebert silt loam (16% sand, 67% silt, 17% clay)	
		% OM / pH	1.1 / 7.1

Comments: PRE = preemergence; EPOST = early postemergence over-the-top; MPOST = mid-postemergence over-the-top; and LPOST = late postemergence over-the-top. Herbicide information can be found in Appendix Table 1.

Application

Type	PRE	EPOST	MPOST	LPOST
Date applied	May 18, 2000	June 7, 2000	June 16, 2000	June 21, 2000
Time	7:15 am	4:45 pm	9:30 am	8:00 am
Incorporation equipment	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	75 / 70	91 / 76	81 / 77	78 / 77
Relative humidity (%)	73	47	81	78
Wind (mph)	8	2	5	3
Cloud cover (%)	80	0	80	30
Soil moisture	optimal	optimal	dry	optimal
Crop stage/height	N/A	2-3 lf / 3"	4-5 lf / 5"	6-8 lf / 12"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/size	Flat fan / 8002VS	Flat fan / 8002VS	Flat fan / 8002VS	Flat fan / 8002VS
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19	22 / 8 / 19	22 / 8 / 19
Gpa / Psi	15 / 22	15 / 22	15 / 22	15 / 22
Weed species (density)	----- [height (in.)] -----			
AMAPA* (mod.)		3"	6"	10"
SIDSP (mod.)		3"	6"	10"
SEBEX (mod.)		3"	6"	10"
IPOLA (mod.)		3"	6"	10"
CASOB (mod.)		3"	6"	10"

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: CGA-362622 was applied PRE and at 2- to 4-leaf, 4- to 6-leaf, and 6- to 8-leaf stages of cotton growth to evaluate weed control and crop safety. PRE treatments applied at 0.0047 lb ai/A through 0.0142 lb ai/A provided acceptable control of morningglory species, hemp sesbania, prickly sida, and pigweed species. Sicklepod control was less than 90% with all PRE treatments. Severe cotton stunting was observed with PRE treatments due to excessive rainfall immediately after applications. POST treatments provided acceptable control of morningglory and pigweed at all rates and application timings. Hemp sesbania and sicklepod were controlled only at rates higher than 0.0071 lb ai/A. CGA 362622 provided control of prickly sida only with PRE applications. No POST control of prickly sida was observed with CGA 362622.

Table 15. Section 1.

Herbicide	Rate (lb ai/A)	Application timing	Weed control								
			Pitted morningglory (IPOLA)				Hemp sesbania (SEBEX)				
			6/1	6/20	6/28	7/24	6/1	6/20	6/28	7/24	
Untreated check			0	0	0	0	0	0	0	0	0
CGA-362622	0.0024	PRE	69	20	36	23	90	10	43	44	
CGA-362622	0.0024	EPOST	0	89	98	93	0	76	100	95	
CGA-362622	0.0024	MPOST	0	25	98	65	0	30	100	70	
CGA-362622	0.0024	LPOST	0	0	30	94	0	0	43	97	
CGA-362622	0.0047	PRE	90	71	85	90	88	60	86	92	
CGA-362622	0.0047	EPOST	0	80	94	93	0	55	70	94	
CGA-362622	0.0047	MPOST	0	33	95	93	0	30	98	97	
CGA-362622	0.0047	LPOST	0	0	30	94	0	0	43	97	
CGA-362622	0.0071	PRE	86	58	68	91	94	54	86	93	
CGA-362622	0.0071	EPOST	0	90	96	95	0	76	98	93	
CGA-362622	0.0071	MPOST	0	33	90	96	0	28	91	97	
CGA-362622	0.0071	LPOST	0	0	33	95	0	0	45	98	
CGA-362622	0.0094	PRE	91	88	91	93	95	94	100	90	
CGA-362622	0.0094	EPOST	0	74	91	69	0	68	76	61	
CGA-362622	0.0094	MPOST	0	33	96	96	0	25	100	99	
CGA-362622	0.0094	LPOST	0	0	43	95	0	0	50	97	
CGA-362622	0.0142	PRE	90	94	95	97	98	98	100	95	
CGA-362622	0.0142	EPOST	0	74	100	91	0	79	99	91	
CGA-362622	0.0142	MPOST	0	30	81	97	0	35	83	98	
CGA-362622	0.0142	LPOST	0	0	23	97	0	0	35	99	
LSD (0.05)			7	18	18	25	3	16	22	25	

continued

Table 15. Section 2.

Herbicide	Rate (lb ai/A)	Application timing	Weed control							
			Sicklepod (CASOB)				Prickly sida (SIDSP)			
			6/1	6/20	6/28	7/24	6/1	6/20	6/28	7/1
Untreated check			0	0	0	0	0	0	0	0
CGA-362622	0.0024	PRE	85	23	38	20	93	0	3	0
CGA-362622	0.0024	EPOST	0	71	84	88	0	0	5	0
CGA-362622	0.0024	MPOST	0	30	94	66	0	0	0	0
CGA-362622	0.0024	LPOST	0	0	43	89	0	0	0	0
CGA-362622	0.0047	PRE	88	58	74	85	91	0	8	0
CGA-362622	0.0047	EPOST	0	70	85	85	0	0	0	0
CGA-362622	0.0047	MPOST	0	33	85	92	0	0	0	0
CGA-362622	0.0047	LPOST	0	0	38	94	0	0	0	0
CGA-362622	0.0071	PRE	81	61	61	70	98	10	35	46
CGA-362622	0.0071	EPOST	0	75	94	93	0	0	0	0
CGA-362622	0.0071	MPOST	0	28	76	97	0	0	0	0
CGA-362622	0.0071	LPOST	0	0	33	91	0	0	0	0
CGA-362622	0.0094	PRE	85	89	95	86	100	55	0	23
CGA-362622	0.0094	EPOST	0	68	81	66	0	0	0	0
CGA-362622	0.0094	MPOST	0	35	89	98	0	0	0	0

continued

Table 15. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Sicklepod (CASOB)				Prickly sida (SIDSP)			
			6/1	6/20	6/28	7/24	6/1	6/20	6/28	7/24
			----- (%) -----							
CGA-362622	0.0094	LPOST	0	0	48	95	0	0	0	0
CGA-362622	0.0142	PRE	86	94	95	92	100	83	70	94
CGA-362622	0.0142	EPOST	0	69	93	91	0	0	0	0
CGA-362622	0.0142	MPOST	0	35	84	98	0	0	0	0
CGA-362622	0.0142	LPOST	0	0	30	96	0	0	0	0
LSD (0.05)			3	17	24	24	6	9	19	21

continued

Table 15. Section 3.

Herbicide	Rate (lb/A)	Application timing	Palmer amaranth (AMAPA) control				Effect on cotton		
			6/1	6/20	6/28	7/24	Stunting	Injury	
			6/1	6/20	6/28	7/24	6/1	6/20	6/28
			----- (%) -----						
Untreated check			0	0	0	0	0	0	0
CGA-362622	0.0024	PRE	100	50	93	49	11	1	3
CGA-362622	0.0024	EPOST	0	100	100	95	0	4	3
CGA-362622	0.0024	MPOST	0	43	99	49	0	6	0
CGA-362622	0.0024	LPOST	0	0	73	63	0	4	8
CGA-362622	0.0047	PRE	100	100	100	93	25	3	0
CGA-362622	0.0047	EPOST	0	100	100	83	0	4	0
CGA-362622	0.0047	MPOST	0	50	96	90	0	3	5
CGA-362622	0.0047	LPOST	0	0	55	83	0	0	8
CGA-362622	0.0071	PRE	100	100	100	98	40	1	0
CGA-362622	0.0071	EPOST	0	100	100	97	0	3	0
CGA-362622	0.0071	MPOST	0	48	90	95	0	6	3
CGA-362622	0.0071	LPOST	0	0	60	83	0	4	11
CGA-362622	0.0094	PRE	100	100	100	98	44	4	0
CGA-362622	0.0094	EPOST	0	100	98	63	0	8	0
CGA-362622	0.0094	MPOST	0	44	100	97	0	4	0
CGA-362622	0.0094	LPOST	0	0	75	93	0	5	10
CGA-362622	0.0142	PRE	100	100	100	100	48	8	3
CGA-362622	0.0142	EPOST	0	90	99	85	0	11	0
CGA-362622	0.0142	MPOST	0	58	90	95	0	11	3
CGA-362622	0.0142	LPOST	0	0	63	88	0	0	11
LSD (0.05)			0	21	13	27	7	7	5

Table 16. CGA-362622 sequential applications, Rohwer, 2000.

TEST INFORMATION

Location	Rohwer	Crop / Cultivar	cotton / DP 451B/RR
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 35 ft	Planting date / Harvest date	May 17, 2000 / N/A
Row width / Number of rows per plot	38 in. / 4	Soil type ... Hebert silt loam (16% sand, 67% silt, 17% clay)	
		% OM / pH	1.1 / 7.1

Comments: EPOST = early postemergence over-the-top; LPOST = late postemergence over-the-top, and LAYBY = post-directed at layby. Herbicide information can be found in Appendix Table 1.

Application

Type	EPOST	LPOST	LAYBY
Date applied	June 7, 2000	June 21, 2000	July 10, 2000
Time	5:00 pm	7:00 am	2:00 pm
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	91 / 76	78 / 77	96 / 74
Relative humidity (%)	47	87	88
Wind (mph)	2	3	3
Cloud cover (%)	0	30	0
Soil moisture	optimal	wet	dry
Crop stage/height	2-3 lf / 3"	6-8 lf / 12"	10-12 lf / 24"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	tractor / 3
Nozzle type/size	Flat fan / 8002VS	Flat fan / 8002VS	Flood / TK 5
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19	4 / 4 / 38
Gpa / Psi	15 / 22	15 / 22	15 / 18
Weed species (density)	----- [height (in.)] -----		
AMAPA* (mod.)	3"	6"	10"
SIDSP (mod.)	3"	6"	10"
SEBEX (mod.)	3"	6"	10"
IPOLA (mod.)	3"	6"	10"
CASOB (mod.)	3"	6"	10"

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: CGA-362622 and pyriithiobac (Staple) were applied alone and in combination at EPOST followed by LPOST applications. EPOST applications of CGA-362622 provided acceptable control of morningglory and pigweed but did not adequately control prickly sida, hemp sesbania, and sicklepod. Pyriithiobac provided greater than 90% control of pigweed but less than 80% control of all other species. Sequential treatments provided acceptable control of morningglory and pigweed. Layby treatments were not effective because weeds were too large at the time of application for adequate coverage of plants.

Table 16. Section 1.

Herbicide	Rate (lb ai/A)	Application timing	Weed control										
			Pitted morningglory (IPOLA)			Hemp sesbania (SEBEX)			Palmer amaranth (AMAPA)				
			6/15	6/20	7/27	6/15	6/20	7/27	6/15	6/20	7/27		
Untreated check			0	0	0	0	0	0	0	0	0	0	0
CGA-362622 fb	0.0047	EPOST	53	94	83	70	62	90	100	98	83		
CGA-362622	0.0047	LAYBY											

continued

Table 16. Section 1. Continued.

Herbicide	Rate (lb ai/A)	Application timing	Weed control								
			Pitted morningglory (IPOLA)			Hemp sesbania (SEBEX)			Palmer amaranth (AMAPA)		
			6/15	6/20	7/27	6/15	6/20	7/27	6/15	6/20	7/27
			----- (%) -----								
CGA-362622 <i>fb</i>	0.0047	EPOST	53	95	90	70	58	79	99	98	74
CGA-362622	0.0071	LAYBY									
CGA-362622 <i>fb</i>	0.0071	EPOST	68	96	85	85	71	84	70	100	75
CGA-362622	0.0047	LAYBY									
Pyrithiobac (Staple) <i>fb</i>	0.044	EPOST	10	53	0	70	25	0	99	70	0
pyrithiobac	0.044	LAYBY									
Pyrithiobac	0.088	LPOST	0	5	89	0	0	99	0	0	100
CGA-362622	0.0094	LPOST	0	0	95	0	0	96	0	0	73
CGA-362622	0.0094	EPOST	58	97	0	74	63	0	100	100	0
Pyrithiobac	0.088	EPOST	40	66	15	49	30	10	98	68	0
CGA-362622 <i>fb</i>	0.0047	EPOST	50	94	70	70	61	73	100	96	83
pyrithiobac	0.044	LAYBY									
Pyrithiobac <i>fb</i>	0.044	EPOST	48	53	0	44	38	0	100	83	0
CGA-362622	0.0047	LAYBY									
CGA-362622 + pyrithiobac	0.0047 0.044	EPOST	93	95	90	84	84	85	99	100	98
LSD (0.05)			13	10	13	16	16	13	12	10	7

continued

Table 16. Section 2.

Herbicide	Rate (lb ai/A)	Application timing	Weed control						Effect on cotton	
			Prickly sida (SIDSP)			Sicklepod (CASOB)			Stunting	Injury
			6/15	6/20	7/27	6/15	6/20	7/27	6/15	6/20
			----- (%) -----							
Untreated check			0	0	0	0	0	0	3	0
CGA-362622 <i>fb</i>	0.0047	EPOST	39	6	0	51	80	71	8	9
CGA-362622	0.0047	LAYBY								
CGA-362622 <i>fb</i>	0.0047	EPOST	55	18	0	58	84	46	10	4
CGA-362622	0.0071	LAYBY								
CGA-362622 <i>fb</i>	0.0071	EPOST	40	41	0	59	86	71	6	9
CGA-362622	0.0047	LAYBY								
Pyrithiobac (Staple) <i>fb</i>	0.044	EPOST	24	15	0	14	10	0	6	0
pyrithiobac	0.044	LAYBY								
Pyrithiobac	0.088	LPOST	0	0	45	0	0	0	3	0
CGA-362622	0.0094	LPOST	0	0	0	0	0	95	3	0
CGA-362622	0.0094	EPOST	36	25	0	49	84	0	10	8
Pyrithiobac	0.088	EPOST	28	28	0	31	5	0	5	3
CGA-362622 <i>fb</i>	0.0047	EPOST	19	20	0	30	80	0	10	6
pyrithiobac	0.044	LAYBY								
Pyrithiobac <i>fb</i>	0.044	EPOST	30	38	0	25	8	0	5	0
CGA-362622	0.0047	LAYBY								
CGA-362622 + pyrithiobac	0.0047 0.044	EPOST	85	78	66	76	85	76	10	7
LSD (0.05)			11	22	13	10	9	14	5	5

Table 17. CGA-362622 in comparison to pyriithiobac (Staple), Rohwer, 2000.

TEST INFORMATION

Location	Rohwer	Crop / Cultivar	cotton / DP 451B/RR
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 35 ft	Planting date / Harvest date	May 17, 2000 / N/A
Row width / Number of rows per plot	38 in. / 4	Soil type ... Hebert silt loam (16% sand, 67% silt, 17% clay)	
		% OM / pH	1.1 / 7.1

Comments: PRE = preemergence; EPOST = early postemergence over-the-top; and MPOST = mid-postemergence over-the-top. Herbicide information can be found in Appendix Table 1.

Application

	PRE	EPOST	MPOST
Type			
Date applied	May 18, 2000	June 7, 2000	June 16, 2000
Time	7:00 am	5:30 pm	8:00 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	75 / 70	92 / 76	81 / 79
Relative humidity (%)	73	46	81
Wind (mph)	8	2	5
Cloud cover (%)	80	0	80
Soil moisture	optimal	optimal	dry
Crop stage/height	N/A	2-3 lf / 3"	4-5 lf / 5"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/size	Flat fan / 8002VS	Flat fan / 8002VS	Flat fan / 8002VS
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19	22 / 8 / 19
Gpa / Psi	15 / 22	15 / 22	15 / 22
Weed species (density)	----- [height (in.)] -----		
AMAPA* (light)		3"	5"
SIDSP (light)		3"	5"
SEBEX (light)		3"	5"
IPOLA (light)		3"	5"
CASOB (light)		3"	5"

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: CGA 362622 and pyriithiobac were applied PRE, early POST, and late POST to evaluate weed control and crop safety. PRE treatments of CGA 362622 at 0.0071 lb ai/A and pyriithiobac at 0.063 lb ai/A provided acceptable control of all species. Significant stunting was observed with PRE treatments of CGA 362622, but crop stunting with pyriithiobac was not as severe. Early POST treatments of CGA 362622 and pyriithiobac provided acceptable control of morningglory and pigweed, but failed to provide acceptable control of hemp sesbania, sicklepod, and prickly sida. Mid-POST treatments of both compounds provided greater than 90% control of morningglory and pigweed. CGA 362622 failed to control prickly sida and hemp sesbania, but provided 95% control of sicklepod. Pyriithiobac failed to provide acceptable control of hemp sesbania, sicklepod, and prickly sida.

Table 17. Section 1.

Herbicide	Rate (lb ai/A)	Application timing	Weed control											
			Pitted morningglory (IPOLA)					Hemp sesbania (SEBEX)						
			6/1	6/15	6/20	6/28	7/21	6/1	6/15	6/20	6/28	7/21		
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
CGA 362622	0.0047	PRE	85	86	80	51	62	69	90	63	64	58		
CGA 362622	0.0071	PRE	89	89	78	83	71	93	91	74	81	68		
Pyriithiobac (Staple)	0.063	PRE	88	93	86	80	88	81	95	88	89	88		
CGA 362622	0.0047	EPOST	0	74	75	98	70	0	74	55	70	18		
CGA 362622	0.0071	EPOST	0	85	88	100	73	0	84	70	89	65		
Pyriithiobac	0.063	EPOST	0	75	83	95	89	0	80	75	81	80		
CGA 362622	0.0071	MPOST	0	0	45	100	100	0	0	40	100	100		
CGA 362622	0.0094	MPOST	0	0	53	96	98	0	0	40	100	100		
Pyriithiobac	0.063	MPOST	0	0	43	93	99	0	0	50	100	99		
LSD (0.05)			5	10	18	16	40	15	13	20	19	39		

continued

Table 17. Section 2.

Herbicide	Rate (lb ai/A)	Application timing	Weed control											
			Sicklepod (CASOB)					Prickly sida (SIDSP)						
			6/1	6/15	6/20	6/28	7/21	6/1	6/15	6/20	6/28	7/21		
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
CGA 362622	0.0047	PRE	90	91	55	59	33	100	76	31	36	33		
CGA 362622	0.0071	PRE	89	93	78	80	60	100	80	53	66	48		
Pyriithiobac (Staple)	0.063	PRE	90	90	90	86	93	100	84	91	94	99		
CGA 362622	0.0047	EPOST	0	76	68	63	25	0	59	0	0	25		
CGA 362622	0.0071	EPOST	0	69	66	78	68	0	59	10	0	0		
Pyriithiobac	0.063	EPOST	0	69	59	70	40	0	61	48	38	71		
CGA 362622	0.0071	MPOST	0	0	45	100	100	0	0	13	0	0		
CGA 362622	0.0094	MPOST	0	0	51	96	100	0	0	0	8	0		
Pyriithiobac	0.063	MPOST	0	0	53	53	8	0	0	40	23	50		
LSD (0.05)			1	10	15	23	28	1	16	25	31	54		

continued

Table 17. Section 3.

Herbicide	Rate (lb ai/A)	Application timing	Palmer amaranth (AMAPA) control					Effect on cotton			
								Stunting		Injury	
			6/1	6/15	6/20	6/28	7/21	6/1	6/15	6/20	6/28
Untreated check			0	0	0	0	0	0	0	0	0
CGA 362622	0.0047	PRE	100	100	100	100	100	28	7	8	7
CGA 362622	0.0071	PRE	100	100	100	100	100	45	11	15	0
Pyriithiobac (Staple)	0.063	PRE	100	100	100	100	100	20	9	7	0
CGA 362622	0.0047	EPOST	0	96	90	100	75	0	5	2	0
CGA 362622	0.0071	EPOST	0	96	100	100	50	0	3	2	0
Pyriithiobac	0.063	EPOST	0	99	100	100	100	0	5	0	0
CGA 362622	0.0071	MPOST	0	0	50	100	98	0	3	3	0
CGA 362622	0.0094	MPOST	0	0	61	100	100	0	0	3	0
Pyriithiobac	0.063	MPOST	0	0	65	100	99	0	0	0	0
LSD (0.05)			1	3	9	1	37	7	6	6	2

Table 18. CGA 362622 in glyphosate-tolerant cotton, Rohwer, 2000.

TEST INFORMATION			
Location	Rohwer	Crop / Cultivar	cotton / DP 451 B/RR
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 35 ft	Planting date / Harvest date	May 17, 2000 / N/A
Row width / Number of rows per plot	38 in. / 4	Soil type ... Hebert silt loam (16% sand, 67% silt, 17% clay)	
		% OM / pH	1.1 / 7.1

Comments: EPOST = early postemergence over-the-top; MPOST = mid-postemergence over-the-top; and LPOST = late postemergence over-the-top. Herbicide information can be found in Appendix Table 1.

Application

	EPOST	MPOST	LPOST
Type			
Date applied	June 7, 2000	June 16, 2000	June 22, 2000
Time	3:00 pm	10:00 am	10:00 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	84 / 76	81 / 79	88 / 79
Relative humidity (%)	44	81	70
Wind (mph)	2	5	4
Cloud cover (%)	20	80	30
Soil moisture	optimal	dry	wet
Crop stage/height	3"	6"	10"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/size	Flat fan / 8002VS	Flat fan / 8002VS	Flat fan / 8002VS
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19	22 / 8 / 19
Gpa / Psi	15 / 22	15 / 22	15 / 22
Weed species (density)		[height (in.)]	
AMAPA* (mod.)	3"	5"	10"
SIDSP (mod.)	3"	5"	10"
SEBEX (mod.)	3"	5"	10"
IPOLA (mod.)	3"	5"	10"
CASOB (mod.)	3"	5"	10"

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: Glyphosate (Roundup Ultra) was applied alone and in combination with CGA 362622 or pyriithiobac to evaluate weed control and crop safety. Glyphosate alone provided acceptable control of prickly sida and pigweed at all rates and application timings. Early POST applications of glyphosate provided greater than 90% control of hemp sesbania, pigweed, and prickly sida. Glyphosate alone did not provide acceptable control of morningglory and sicklepod. Glyphosate in combination with CGA 362622 or pyriithiobac provided greater than 95% control of hemp sesbania, morningglory, pigweed, and prickly sida. CGA 362622 in combination with glyphosate provided 86% control of sicklepod, whereas pyriithiobac in combination with glyphosate provided only 76% control of sicklepod. Injury was observed from over-the-top applications when CGA 362622 and glyphosate were combined; however, injury dissipated quickly and was not visible 21 DAT.

Table 18. Section 1.

Herbicide	Rate (lb ai/A)	Application timing	Weed control									
			Hemp sesbania (SEBEX)			Pitted morningglory (IPOLA)			Palmer amaranth (AMAPA)			
			6/20	6/29	7/24	6/20	6/29	7/24	6/20	6/29	7/24	
			----- (%) -----									
Untreated check			0	0	0	0	0	0	0	0	0	0
Glyphosate (Roundup Ultra)	0.75	EPOST	85	100	98	73	84	91	100	98	96	
Glyphosate + CGA 362622	0.75 0.0047	EPOST	100	100	99	89	100	97	100	99	97	
Glyphosate + CGA 362622	0.75 0.0071	EPOST	100	100	97	91	100	97	100	98	96	
Glyphosate + pyrithiobac (Staple)	0.75 0.063	EPOST	100	100	99	94	98	98	100	100	98	
CGA 362622	0.0071	EPOST	70	93	78	86	98	96	100	99	23	
Pyrithiobac	0.063	EPOST	40	53	68	43	45	69	60	60	43	
Glyphosate	0.75	MPOST	64	83	87	48	83	95	88	100	96	
Glyphosate + CGA 362622	0.75 0.0071	MPOST	68	93	98	60	83	97	95	100	97	
Glyphosate + CGA 362622	0.75 0.0094	MPOST	90	100	99	70	93	99	100	100	98	
CGA 362622	0.0094	MPOST	80	98	100	64	96	100	100	100	0	
Pyrithiobac	0.063	MPOST	68	100	93	50	74	86	100	95	60	
Glyphosate <i>fb</i>	0.75	EPOST	44	68	93	35	59	81	46	70	46	
glyphosate + pyrithiobac	0.75 0.063	LPOST										
Glyphosate <i>fb</i>	0.75	EPOST	85	100	96	69	85	93	96	100	95	
glyphosate	0.75	LPOST										
Glyphosate <i>fb</i>	0.75	EPOST	84	100	95	70	91	91	98	100	96	
glyphosate + CGA 362622	0.75 0.0071	LPOST										
Glyphosate <i>fb</i>	0.75	EPOST	91	96	98	70	81	91	100	100	91	
glyphosate + CGA 362622	0.75 0.0094	LPOST										
Glyphosate <i>fb</i>	0.75	EPOST	91	96	97	76	80	95	94	100	97	
CGA 362622	0.0094	LPOST										
Glyphosate <i>fb</i>	0.75	EPOST	89	93	96	73	81	90	93	98	93	
pyrithiobac	0.063	LPOST										
Glyphosate <i>fb</i>	0.75	EPOST	93	96	97	69	93	94	100	100	95	
glyphosate + prometryn (Caparol FL)	0.75 0.063	LPOST										
LSD (0.05)			25	22	16	22	22	17	23	23	31	

continued

Table 18. Section 2.

Herbicide	Rate (lb ai/A)	Application timing	Weed control						Cotton injury 6/29
			Prickly sida (SIDSP)			Sicklepod (CASOB)			
			6/20	6/29	7/24	6/20	6/29	7/24	
Untreated check			0	0	0	0	0	0	0
Glyphosate (Roundup Ultra)	0.75	EPOST	75	90	98	70	83	88	0
Glyphosate + CGA 362622	0.75 0.0047	EPOST	100	100	99	93	83	80	0
Glyphosate + CGA 362622	0.75 0.0071	EPOST	96	98	98	91	86	80	0
Glyphosate + pyrithiobac (Staple)	0.75 0.063	EPOST	98	98	100	85	79	85	0
CGA 362622	0.0071	EPOST	0	10	98	68	61	80	0
Pyrithiobac	0.063	EPOST	23	23	72	30	30	61	0
Glyphosate	0.75	MPOST	65	98	98	58	76	94	0
Glyphosate + CGA 362622	0.75 0.0071	MPOST	45	99	98	65	90	98	0
Glyphosate + CGA 362622	0.75 0.0094	MPOST	61	98	99	73	89	98	8
CGA 362622	0.0094	MPOST	0	0	100	53	95	100	4
Pyrithiobac	0.063	MPOST	40	53	86	48	43	53	0
Glyphosate <i>fb</i> glyphosate + pyrithiobac	0.75 0.75 0.063	EPOST LPOST	48	63	92	38	59	78	0
Glyphosate <i>fb</i> glyphosate	0.75 0.75	EPOST LPOST	98	99	93	70	84	84	0
Glyphosate <i>fb</i> glyphosate + CGA 362622	0.75 0.75 0.0071	EPOST LPOST	83	94	96	65	83	90	0
Glyphosate <i>fb</i> glyphosate + CGA 362622	0.75 0.75 0.0094	EPOST LPOST	89	93	91	71	84	83	0
Glyphosate <i>fb</i> CGA 362622	0.75 0.0094	EPOST LPOST	93	74	96	76	75	88	0
Glyphosate <i>fb</i> pyrithiobac	0.75 0.063	EPOST LPOST	89	98	95	63	79	81	0
Glyphosate <i>fb</i> glyphosate + prometryn (Caparol FL)	0.75 0.75 0.063	EPOST LPOST	85	99	97	71	91	90	0
LSD (0.05)			30	26	17	21	21	15	3

Table 19. CGA 36622 and glyphosate (Roundup) timings, Rohwer, 2000.

TEST INFORMATION

Location	Rohwer	Crop / Cultivar	cotton / DP 451 B/RR
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 40 ft	Planting date	May 24, 2000
Row width / Number of rows per plot	38 in. / 4	Soil type ...	Hebert silt loam (16% sand, 67% silt, 17% clay)
		% OM / pH	1.1 / 7.15

Comments: EPOST = early postemergence over-the-top; DIR = post-directed; and LAYBY = layby stage of cotton. Herbicide information can be found in Appendix Table 1.

Application

Type	EPOST	DIR	LAYBY
Date applied	June 13, 2000	June 22, 2000	July 10, 2000
Time	10:00 am	4:00 pm	8:00 pm
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	89 / 81	85 / 84	83 / 74
Relative humidity (%)	57	55	60
Wind (mph)	5	2	3
Cloud cover (%)	0	0	0
Soil moisture	dry	dry	dry
Crop stage/height	2-3 lf / 4"	6-8 lf / 10"	12 lf / 20"
Sprayer type/mph	BkPkCO ₂ / 3	Tractor / 3	Tractor / 3
Nozzle type/size	Flat fan / 8002VS	Flat fan / 0C02	Flood / TK5
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	4 / 8 / 20	4 / 4 / 38
Gpa / Psi	15 / 22	15 / 22	15 / 18
Weed species (density)	----- [height (in.)] -----		
IPOLA* (mod.)	4"	10"	22"
AMARE (mod.)	4"	10"	22"
SIDSP (mod.)	4"	10"	22"

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: CGA 362622 was applied at EPOST, DIR, and LAYBY timings of cotton to evaluate control of pigweed, pitted morningglory, and prickly sida. EPOST applications of CGA 362622 provided excellent control of pigweed and pitted morningglory but failed to provide adequate control at DIR and LPOST timings. Weeds at DIR and LPOST were large, and adequate coverage of the plants was not obtained. CGA 362622 provided no postemergence control of prickly sida. EPOST applications of pyriithiobac and glyphosate provided greater than 90% control of all species 22 DAT.

Table 19.

Herbicide	Rate (lb ai/A)	Application timing	Weed control							
			Palmer amaranth (AMAPA)			Pitted morningglory (IPOLA)			Prickly sida (SIDSP)	
			6/29	7/27	8/22	6/29	7/27	8/22	9/29	8/22
Untreated check			0	0	0	0	0	0	0	0
CGA 362622 + AG-98	0.0047 0.25%	EPOST	93	81	50	100	81	60	0	0
CGA 362622 + AG-98	0.007 0.25%	EPOST	97	45	68	99	43	75	0	0
Pyriithiobac (Staple) + AG-98	0.063 0.25%	EPOST	98	84	66	89	85	63	95	20
Glyphosate (Roundup Ultra)	0.7	EPOST	100	95	94	84	84	75	93	69
CGA 362622 + AG-98	0.007 0.25%	MPOST	53	33	0	40	31	0	0	0
CGA 362622 + AG-98	0.009 0.25%	MPOST	60	61	8	50	66	0	15	0
Pyriithiobac + AG-98	0.063 0.25%	MPOST	35	63	0	25	61	0	10	0
Glyphosate	0.7	MPOST	43	51	0	35	50	0	15	0
CGA 362622 + AG-98	0.007 0.25%	LAYBY	0	13	0	0	15	0	0	0
CGA 362622 + AG-98	0.009 0.25%	LAYBY	0	18	0	0	18	0	0	0
Pyriithiobac + AG-98	0.063 0.25%	LAYBY	0	29	53	0	28	48	0	0
Glyphosate	0.7	LAYBY	0	15	0	0	13	0	0	18
LSD (0.05)			16	43	9	15	40	10	17	27

Table 20. Touchdown (glyphosate): POST control in glyphosate-tolerant cotton with new formulation (3SL), Fayetteville, 2000.

TEST INFORMATION

Location	Fayetteville	Crop / Cultivar	cotton / DPL 451BR
Experimental design / replications	RCB / 4	Seeding rate	4 / ft
Plot size	3.3 ft x 27 ft	Planting date / Harvest date	May 22, 2000 / N/A
Row width / Number of rows per plot	40 inches / 1	Soil type	Taloka silt loam (21 sand, 68% silt, 11% clay)
		% OM / pH	1.1 / 5.7

Comments: Each plot was 12 ft weedy and 12 ft weedfree with 3-ft alleys. PRE = preemergence; EOT = early over-the-top (1-lf, 3-inch cotton); and LOT = late over-the-top (4-lf, 6- to 7-inch cotton). Weed sizes at LOT were taken from plots sprayed with EOT treatments. The Touchdown formulation has 3 lb acid equivalent of glyphosate/gal. Rates for Touchdown and Roundup Ultra are calculated from 3 lb ae/gal; others are in ai/gal. Herbicide information can be found in Appendix Table 1.

Application

Type	PRE	EOT	LOT
Date applied	May 22, 2000	June 6, 2000	June 22, 2000
Time	6:30 pm	4:00 pm	5:00 pm
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	77 / 77	79 / 84	88 / 89
Relative humidity (%)	80	65	75
Wind (mph)	4	2	3
Cloud cover (%)	20	0	0
Soil moisture	moist	moist	wet
Crop stage/height	N/A	1 lf / 2.5-3 in.	4 lf / 6-7 in.
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/size	Flat fan / XR8002VS	Flat Fan / XR8002VS	Flat fan / XR8002VS
Boom ht / # Noz / Spacing (in.)	20 / 2 / 18	21 / 2 / 18	26 / 2 / 18
Gpa / Psi	15 / 24	15 / 26	15 / 24
Weed species (density)	----- [no. of leaves / height (cm.)] -----		
DIGSA* (3/ft ²)		1-2 lf / >1 cm	2 lf / 1 cm
AMACH (1/ft ²)		cot.-2 lf / 0.5-1 cm	
AMAPA (1/ft ²)		cot - 2 lf / 0.5 cm	
IPOLA (4/ft ²)		1-2 lf / 3 cm	3-8 lf / 5 cm
IPOHG (4/ft ²)		1-2 lf / 2-3.5 cm	3 lf / 3 cm
ABUTH (3/ft ²)		2 lf / 2 cm	
SIDSP (2/ft ²)		1-2 lf / 0.5 cm	2 lf / 1 cm

*See Appendix Table 3 for definition of Bayer codes.

Conclusions: Repeat applications of the Touchdown and Roundup Ultra formulations generally controlled pitted morningglory better than single applications at EOT and LOT. The formulations were equally active.

Table 20. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Large crabgrass (DIGSA)			Smooth pigweed (AMACH)			Palmer amaranth (AMAPA)		
			6/13	6/29	7/26	6/13	6/29	7/26	6/13	6/29	7/26
			----- (%) -----								
Untreated check			0	0	0	0	0	0	0	0	0
Touchdown (3 SL)	0.75	EOT	100	99	86	100	100	93	100	100	99
Touchdown	0.75	LOT	0	98	95	0	99	100	0	100	100
Touchdown <i>fb</i>	0.75	EOT	100	100	98	100	100	100	100	100	100
Touchdown	0.75	LOT									
Touchdown <i>fb</i>	0.75	EOT	100	100	99	100	100	100	100	100	100
Touchdown	0.56	LOT									
Roundup Ultra (3 SL)	0.75	EOT	100	99	85	100	100	95	100	100	94
Roundup Ultra	0.75	LOT	0	97	97	0	98	99	0	100	100
Roundup Ultra <i>fb</i>	0.75	EOT	100	100	99	100	100	100	100	100	100
Roundup Ultra	0.75	LOT									
Roundup Ultra <i>fb</i>	0.75	EOT	100	100	98	100	100	100	100	100	99
Roundup Ultra	0.56	LOT									
Pendimethalin (Prowl) + fluometuron (Meturon) <i>fb</i>	0.83 1.0	PRE PRE	100	100	100	100	100	100	100	100	100
Touchdown <i>fb</i>	0.75	EOT									
Touchdown	0.56	LOT									
Pendimethalin + fluometuron <i>fb</i>	0.83 1.0	PRE PRE	100	100	100	100	100	100	100	100	100
Roundup Ultra <i>fb</i>	0.75	EOT									
Roundup Ultra	0.56	LOT									
Touchdown <i>fb</i>	0.56	EOT	100	100	99	100	100	100	100	100	100
Touchdown	0.56	LOT									
Roundup Ultra <i>fb</i>	0.56	EOT	100	100	98	100	100	100	100	100	99
Roundup Ultra	0.56	LOT									
LSD (0.05)			1	2	6	1	1	4	1	1	4

continued

Table 20. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Pitted morningglory (IPOLA)			Hemp sesbania (SEBEX)			Prickly sida (SIDSP)		
			6/13	6/29	7/26	6/13	6/29	7/26	6/13	6/29	7/26
----- (%) -----											
Untreated check			0	0	0	0	0	0	0	0	0
Touchdown (3 SL)	0.75	EOT	63	85	58	99	98	90	100	99	90
Touchdown	0.75	LOT	0	61	79	0	73	94	0	90	100
Touchdown <i>fb</i>	0.75	EOT	56	91	95	99	100	100	100	100	100
Touchdown	0.75	LOT									
Touchdown <i>fb</i>	0.75	EOT	66	93	95	100	100	100	100	100	100
Touchdown	0.56	LOT									
Roundup Ultra (3 SL)	0.75	EOT	61	83	59	100	99	95	100	100	82
Roundup Ultra	0.75	LOT	0	59	84	0	70	93	0	80	99
Roundup Ultra <i>fb</i>	0.75	EOT	61	92	95	100	100	100	100	100	100
Roundup Ultra	0.75	LOT									
Roundup Ultra <i>fb</i>	0.75	EOT	64	94	93	100	100	100	100	100	100
Roundup Ultra	0.56	LOT									
Pendimethalin (Prowl) + fluometuron (Meturon) <i>fb</i>	0.83 1.0	PRE PRE	97	100	100	100	100	100	100	100	100
Touchdown <i>fb</i>	0.75	EOT									
Touchdown	0.56	LOT									
Pendimethalin + fluometuron <i>fb</i>	0.83 1.0	PRE PRE	99	100	100	100	100	100	100	100	100
Roundup Ultra <i>fb</i>	0.75	EOT									
Roundup Ultra	0.56	LOT									
Touchdown <i>fb</i>	0.56	EOT	60	92	91	99	100	100	100	100	100
Touchdown	0.56	LOT									
Roundup Ultra <i>fb</i>	0.56	EOT	56	89	91	99	99	99	100	100	99
Roundup Ultra	0.56	LOT									
LSD (0.05)			6	4	11	1	6	5	1	5	9

continued

Table 20. Section 3.

Herbicide	Rate (lb/A)	Application timing	Velvetleaf (ABUTH) control			Cotton injury ^z		
			6/13	6/29	7/26	6/13	6/26	6/29
Untreated check			0	0	0	0	0	0
Touchdown (3 SL)	0.75	EOT	100	98	96	0	0	0
Touchdown	0.75	LOT	0	91	100	0	16	10
Touchdown <i>fb</i>	0.75	EOT	100	100	100	0	12	8
Touchdown	0.75	LOT						
Touchdown <i>fb</i>	0.75	EOT	98	100	100	0	1	4
Touchdown	0.56	LOT						
Roundup Ultra (3 SL)	0.75	EOT	100	100	96	1	0	0
Roundup Ultra	0.75	LOT	0	83	100	0	3	1
Roundup Ultra <i>fb</i>	0.75	EOT	100	100	100	0	3	1
Roundup Ultra	0.75	LOT						
Roundup Ultra <i>fb</i>	0.75	EOT	100	99	100	3	3	1
Roundup Ultra	0.56	LOT						
Pendimethalin (Prowl) + fluometuron (Meturon) <i>fb</i>	0.83 1.0	PRE PRE	100	100	100	3	6	3
Touchdown <i>fb</i>	0.75	EOT						
Touchdown	0.56	LOT						
Pendimethalin + fluometuron <i>fb</i>	0.83 1.0	PRE PRE	100	100	100	4	0	0
Roundup Ultra <i>fb</i>	0.75	EOT						
Roundup Ultra	0.56	LOT						
Touchdown <i>fb</i>	0.56	EOT	100	100	100	1	4	5
Touchdown	0.56	LOT						
Roundup Ultra <i>fb</i>	0.56	EOT	100	100	100	1	0	0
Roundup Ultra	0.56	LOT						
LSD (0.05)			1	4	3	NS	7	5

^z Ratings on 6/9, 6/20, 7/12, and 7/26 were zero for all treatments.

Table 21. Touchdown (3 SL formulation) selectivity on cotton, Marianna, 2000.

TEST INFORMATION

Location	Marianna	Crop / Cultivar	cotton / DP 451 BR
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 40 ft	Planting date / Harvest date	May 24, 2000 / Oct. 13, 2000
Row width / Number of rows per plot	38 in. / 4	Soil type	silt loam (2% sand, 86% silt, 12% clay)
		% OM / pH	1.1 / 5.7

Comments: Touchdown and Roundup Ultra rates are calculated on 3 lb acid equivalent of glyphosate/gal. Herbicide information can be found in Appendix Table 1.

Application

	COT.-1 LF	4 LF
Type		
Date applied	June 5, 2000	June 19, 2000
Time	5:30 pm	7:30 am
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	72	70 / 82
Relative humidity (%)	N/A	75
Wind (mph)	6	3
Cloud cover (%)	0	0
Soil moisture	adequate	excessive
Crop stage	cot. - 1 lf	4 lf
Sprayer type/mph	Tractor / 3.5	Tractor / 3.5
Nozzle type/size	Flat fan / 11003	Flat fan / 11003
Boom ht / # Noz / Spacing (in.)	16 / 8 / 19	16 / 8 / 19
Gpa / Psi	20 / 27	20 / 27

Conclusions: Visual cotton injury, although statistically significant in some cases, was 10% and was transient. Early-season square shed, number of fruiting nodes/plant, and plant height did not differ among treatments. Total number of squares per acre differed only on July 12. More squares were present on cotton that had a 4-leaf application, either alone or after a cot.- to 1-leaf application, than on untreated cotton. However, there may have been late square shed or boll shed, because yield from 4-leaf treatments was significantly lower than from the single cot- to 1-leaf treatment.

Table 20. Section 1.

Herbicide	Rate (lb ae/A)	Application timing	Cotton injury ^z			Plant height		
			6/7	6/9	6/22	6/28	7/6	7/12
			----- (%) -----			----- (in.) -----		
Untreated			0.0	0.0	0.0	18.63	25.25	26.25
Touchdown (3 SL)	0.75	COT-1L	0.0	0.0	0.0	18.38	23.38	25.88
Touchdown	0.75	4 LF	0.0	1.3	6.3	17.25	23.38	25.38
Touchdown <i>fb</i>	0.75	COT-1L	0.0	0.0	5.0	17.50	22.38	24.88
Touchdown	0.75	4 LF						
Roundup Ultra (3 SL)	0.75	COT-1L	10.0	5.0	0.0	18.13	23.63	26.13
Roundup Ultra	0.75	4 LF	0.0	0.0	0.0	18.00	24.00	25.38
Roundup Ultra <i>fb</i>	0.75	COT-1L	8.8	2.5	0.0	17.38	23.38	25.88
Roundup Ultra	0.75	4 LF						
LSD (0.05)			2.5	3.3	3.3	NS	NS	NS

continued

Table 20. Section 2.

Herbicide	Rate (lb ae/A)	Application timing	Squares			Square shed		
			6/28	7/6	7/12	6/28	7/6	7/12
			----- (no./A) -----			----- (%) -----		
Untreated			183812	250098	241500	1.33	1.55	9.60
Touchdown (3 SL)	0.75	COT-1L	169239	254153	271763	2.95	2.40	1.80
Touchdown	0.75	4 LF	186964	292612	320510	5.85	2.67	2.83
Touchdown <i>fb</i>	0.75	COT-1L	178381	272838	303330	2.20	2.27	2.90
Touchdown	0.75	4 LF						
Roundup Ultra (3 SL)	0.75	COT-1L	173696	270444	267937	0.00	0.00	1.95
Roundup Ultra	0.75	4 LF	173552	262836	285118	3.55	0.00	2.10
Roundup Ultra <i>fb</i>	0.75	COT-1L	188555	274142	292167	0.68	1.35	2.17
Roundup Ultra	0.75	4 LF						
LSD (0.05)			NS	NS	27982	NS	NS	4.21

continued

Table 20. Section 3.

Herbicide	Rate (lb ae/A)	Application timing	Fruiting nodes			Nodes Above White Flower (NAWF)			Days to	Seedcotton
			6/28	7/6	7/12	7/19	7/27	8/4	8/4	yield
			---- (no./plant) ----			----- (no./plant) ---			(no. of days)	(lb/A)
Untreated			3.80	5.17	5.43	6.47	5.07	4.35	65.0	2276
Touchdown (3 SL)	0.75	COT-1L	3.55	5.30	5.63	6.65	5.25	4.60	67.5	2649
Touchdown	0.75	4 LF	3.93	5.60	6.15	7.68	6.35	5.03	72.3	2079
Touchdown <i>fb</i>	0.75	COT-1L	3.57	5.47	6.13	7.17	5.80	4.80	71.0	2030
Touchdown	0.75	4 LF								
Roundup Ultra (3 SL)	0.75	COT-1L	3.40	5.38	5.47	6.82	5.20	4.32	65.8	2570
Roundup Ultra	0.75	4 LF	3.67	5.27	5.93	7.15	5.45	4.90	68.3	2079
Roundup Ultra <i>fb</i>	0.75	COT-1L	3.60	5.27	5.68	7.00	5.75	4.78	70.8	2060
Roundup Ultra	0.75	4 LF								
LSD (0.05)			NS	NS	NS	0.56	0.53	0.47	4.2	265

Table 22. Evaluation of Touchdown (3 SL formulation) in glyphosate-tolerant cotton, Rohwer, 2000.

TEST INFORMATION

Location	Rohwer	Crop / Cultivar	cotton / DP 451 B/RR
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 35 ft	Planting date	June 6, 2000
Row width / Number of rows per plot	38 in. / 4	Soil type ... Hebert silt loam (16% sand, 67% silt, 17% clay)	
		% OM / pH	1.1 / 7.1

Comments: 2 LF = 2-leaf cotton; and 4 LF = 4-leaf cotton (over-the-top). Rates are based on 3 lb acid equivalent/gal for each herbicide (0.56 lb ae/A = 0.75 lb ai/A = 1.5 pt/A). Herbicide information can be found in Appendix Table 1.

Application

	2 LF	4 LF
Type		
Date applied	June 20, 2000	July 6, 2000
Time	3:40 pm	11:15 am
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	98 / 90	93 / 88
Relative humidity (%)	58	60
Wind (mph)	5	4
Cloud cover (%)	50	10
Soil moisture	wet	dry
Crop stage/height	2 lf / 2"	4-5 lf / 6"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/size	Flat fan / 8002VS	Air induc. / 11002VS
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19
Gpa / Psi	15 / 22	15 / 22

Conclusions: Activity of the Touchdown 3 SL (formerly sulfosate formulation) and Roundup Ultra formulations of glyphosate at 0.75 lb ai/A applied to 2- and 4- leaf cotton in glyphosate-tolerant cotton did not differ.

Table 22. Section 1.

Herbicide	Rate (lb ae/A)	Application timing	Weed control			Cotton injury		
			Pitted morningglory (IPOLA)	Prickly sida (SIDSP)	Broadleaf signalgrass (BRAPP)	6/16	6/28	7/26
			6/16	6/16	6/16	----- (%) -----		
Untreated check			4	33	100	0	0	0
Touchdown (3 SL)	0.56	2 LF	0	55	60	8	1	0
Touchdown	0.56	4 LF	1	36	74	1	0	0
Touchdown <i>fb</i>	0.56	2 LF	4	70	68	3	0	0
Touchdown	0.56	4 LF						
Roundup Ultra	0.56	2 LF	3	33	74	0	3	0
Roundup Ultra	0.56	4 LF	1	50	97	3	1	0
Roundup Ultra <i>fb</i>	0.56	2 LF	3	75	97	1	3	0
Roundup Ultra	0.56	4 LF						
LSD (0.05)			NS	NS	NS	7	NS	NS

Table 23. Weed control in glyphosate-tolerant cotton with Touchdown, Rohwer, 2000.**TEST INFORMATION**

Location	Rohwer	Crop / Cultivar	cotton / DP 451 B/RR
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 35 ft	Planting date	May 24, 2000
Row width / Number of rows per plot	38 in. / 4	Soil type ...	Hebert silt loam (16% sand, 67% silt, 17% clay)
		% OM / pH	1.1 / 7.1

Comments: PRE = preemergence; 2 LF = 2-leaf cotton; and 4 LF = 4-leaf cotton. Touchdown and Roundup are based on 3 lb acid equivalent/gal (0.56 lb ae/A = 0.75 lb ai/A = 1.5 pt/A) Herbicide information can be found in Appendix Table 1.

Application

Type	PRE	2 LF	4 LF
Date applied	May 25, 2000	June 13, 2000	June 20, 2000
Time	7:15 am	8:30 am	10:00 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	80 / 76	86 / 81	83 / 80
Relative humidity (%)	85	64	79
Wind (mph)	2	2	5
Cloud cover (%)	100	50	100
Soil moisture	optimal	dry	wet
Crop stage/height	N/A	2-3 lf / 6"	4 lf / 8"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/size	Flat fan / 8002VW	Flat fan / 8002VS	Flat fan / 8002VS
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19	22 / 8 / 19
Gpa / Psi	15 / 22	15 / 22	15 / 22
Weed species (density)	-----	[height (in.)] -----	
AMARE* (mod.)		6"	8"
IPOLA (mod.)		6"	8"
SIDSP (mod.)		6"	8"
ECHCG (mod.)		6"	8"

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: The formulations Touchdown 3SL and Roundup Ultra were applied at the 2- and 4-leaf stages of cotton to evaluate control of pigweed, pitted morningglory, prickly sida, and barnyardgrass. Touchdown and Roundup Ultra provided excellent control of pigweed and barnyardgrass, but did not adequately control pitted morningglory or prickly sida. However, sequential applications (2-leaf *fb* 4-leaf) provided greater than 85% control of all species. Excellent control was obtained when Roundup Ultra or Touchdown was applied following pendimethalin (Prowl) + fluometuron (Cotoran) PRE.

Table 23.

Herbicide	Rate (lb/A) ^z	Application timing	Weed control						
			Redroot pigweed (AMARE)		Pitted morningglory (IPOLA)		Barnyardgrass (ECHCG)		Prickly sida (SIDSP)
			6/16	8/24	6/16	8/24	6/16	8/24	6/16
Untreated check			0	0	0	0	0	0	0
Touchdown (3 SL)	0.56	2 LF	100	83	48	76	79	76	53
Touchdown	0.56	4 LF	0	98	0	84	0	90	0
Touchdown <i>fb</i>	0.56	2 LF	100	99	50	84	84	95	55
Touchdown	0.56	4 LF							
Touchdown <i>fb</i>	0.56	2 LF	100	89	55	69	84	76	60
Touchdown	0.38	4 LF							
Roundup Ultra	0.56	2 LF	100	98	23	84	44	81	44
Roundup Ultra	0.56	4 LF	0	100	0	83	0	91	0
Roundup Ultra <i>fb</i>	0.56	2 LF	100	99	28	88	48	93	31
Roundup Ultra	0.56	4 LF							
Roundup Ultra <i>fb</i>	0.56	2 LF	100	100	29	93	56	93	31
Roundup Ultra	0.38	4 LF							
Pendimethalin (Prowl) + fluometuron (Cotoran) <i>fb</i>	1.0		100	100	100	89	100	95	100
Touchdown <i>fb</i>	1.0	PRE							
Touchdown <i>fb</i>	0.56	2 LF							
Touchdown	0.56	4 LF							
Pendimethalin + fluometuron <i>fb</i>	1.0		100	100	100	92	100	95	100
Roundup Ultra <i>fb</i>	1.0	PRE							
Roundup Ultra <i>fb</i>	0.56	2 LF							
Roundup Ultra	0.56	4 LF							
LSD (0.05)			1	7	11	11	13	13	16

^z Touchdown and Roundup Ultra rates are calculated as lb ae/A; other herbicide rates as lb ai/A.

Table 24. Buctril study, Marianna, 2000.

TEST INFORMATION

Location	Marianna	Crop / Cultivar	cotton / BXN 47
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 30 ft	Planting date	May 11, 2000
Row width / Number of rows per plot	38 in. / 4	Soil type	silt loam (2% sand, 86% silt, 12% clay)
		% OM / pH	1.1 / 5.7

Comments: PRE = preemergence; and OT = over-the-top at 3- to 4-leaf cotton. Herbicide information can be found in Appendix Table 1.

Application

Type	PRE	OT
Date applied	May 12, 2000	May 30, 2000
Time	5:30 pm	2:00 pm
Incorporation equipment	N/A	N/A
Air temperature (F)	85	88
Wind (mph)	10	4
Cloud cover (%)	0	0
Soil moisture	adequate	adequate
Crop stage	N/A	3-4 lf
Sprayer type/mph	Tractor / 3.5	Tractor / 3.5
Nozzle type/size	Flat fan / 8003	Flat fan / 8003
Boom ht / # Noz / Spacing (in.)	19 / 8 / 19	19 / 8 / 19
Gpa / Psi	20 / 28	20 / 28
Weed species (density)	----- (number of leaves) -----	
SIDSP* (2/ft ²)	cot. - 2 lf	cot.-4 lf
IPOLA (3/ft ²)	cot. - 4 lf	cot. - 5 lf
IPOHG (2/ft ²)	cot. - 4 lf	cot. - 5 lf
AMACH (3/ft ²)	cot. - 3 lf	cot. - 5 lf

*See Appendix Table 3 for definition of Bayer codes.

Conclusions: Bromoxynil alone failed to control prickly sida and smooth pigweed at 3 WAT. Pyriithiobac PRE completely controlled prickly sida, and good control (82 to 92%) was obtained with pyriithiobac + bromoxynil OT. By 8 WAT, more regrowth of smooth pigweed had occurred from bromoxynil at 0.25 lb/A with pyriithiobac than from the higher bromoxynil rates. Morningglory species were controlled 80% with all treatments except a single treatment of pyriithiobac PRE. There was a slight advantage to applying pyriithiobac PRE before pyriithiobac + bromoxynil at 0.25 lb/A or using a 0.375 lb/A bromoxynil rate. CGA-362622 OT and pyriithiobac PRE *fb* pyriithiobac + bromoxynil OT caused slight cotton stunting (13 to 14%) until 3 WAT.

Table 24. Section 1.

Herbicide	Rate (lb ai/A)	Application timing	Weed control							
			Prickly sida (SIDSP)				Smooth pigweed (AMACH)			
			6/7	6/13	6/20	7/19	6/7	6/13	6/20	7/19
Untreated			0	0	0	0	0	0	0	0
Pyrithiobac (Staple)	0.031	PRE	99	100	84	100	88	89	86	75
Pyrithiobac <i>fb</i> bromoxynil (Buctril) + AG-98	0.031 0.25 0.25%	PRE OT	98	99	89	100	88	92	86	75
Pyrithiobac <i>fb</i> pyrithiobac + bromoxynil + AG-98	0.031 0.031 0.25 0.25%	PRE OT	99	100	96	100	89	92	88	82
Pyrithiobac + bromoxynil + AG-98	0.031 0.25 0.25%	OT	80	81	86	82	74	77	86	54
Pyrithiobac + bromoxynil + AG-98	0.031 0.375 0.25%	OT	84	96	79	89	90	91	86	74
Pyrithiobac + bromoxynil + AG-98	0.031 0.5 0.25%	OT	94	94	92	92	92	89	91	80
Bromoxynil + AG-98	0.25 0.25%	OT	61	65	35	72	41	56	39	30
Bromoxynil + AG-98	0.375 0.25%	OT	81	89	56	81	56	72	50	46
CGA 362622 + AG-98	0.0047 0.25%	OT	48	50	36	11	49	50	43	27
LSD (0.05)			18	12	14	14	16	15	14	23

continued

Table 24. Section 2.

Herbicide	Rate (lb ai/A)	Application timing	Weed control							
			Pitted and entireleaf morningglory (IPOSS)				Carpetweed (MOLVE)			
			6/7	6/13	6/20	7/19	6/7	6/13	6/20	7/19
Untreated			0	0	0	0	0	0	0	0
Pyrithiobac	0.031	PRE	75	78	69	73	100	100	100	100
Pyrithiobac <i>fb</i> bromoxynil + AG-98	0.031 0.25 0.25%	PRE OT	73	92	94	90	100	100	100	100
Pyrithiobac <i>fb</i> pyrithiobac + bromoxynil + AG-98	0.031 0.031 0.25 0.25%	PRE OT	78	91	96	93	100	100	100	100
Pyrithiobac + bromoxynil + AG-98	0.031 0.25 0.25%	OT	90	94	91	81	100	100	100	100

continued

Table 24. Section 2. Continued.

Herbicide	Rate (lb ai/A)	Application timing	Weed control							
			Pitted and entireleaf morningglory (IPOSS)				Carpetweed (MOLVE)			
			6/7	6/13	6/20	7/19	6/7	6/13	6/20	7/19
			----- (%) -----							
Pyrithiobac + bromoxynil + AG-98	0.031 0.375 0.25%	OT	93	90	93	84	100	100	100	100
Pyrithiobac + bromoxynil + AG-98	0.031 0.5 0.25%	OT	93	96	96	85	100	100	100	100
Bromoxynil + AG-98	0.25 0.25%	OT	89	85	44	84	100	86	48	95
Bromoxynil + AG-98	0.375 0.25%	OT	90	96	58	91	100	99	81	100
CGA 362622 + AG-98	0.0047 0.25%	OT	50	80	75	80	100	100	100	100
LSD (0.05)			6	6	15	8	1	5	17	4

continued

Table 24. Section 3.

Herbicide	Rate (lb ai/A)	Application timing	Cotton injury			
			6/7	6/13	6/20	7/19
			----- (%) -----			
Untreated			0	0	0	0
Pyrithiobac	0.031	PRE	0	4	0	0
Pyrithiobac <i>fb</i> bromoxynil + AG-98	0.031 0.25 0.25%	PRE OT	4	7	0	0
Pyrithiobac <i>fb</i> pyrithiobac + bromoxynil + AG-98	0.031 0.031 0.25 0.25%	PRE OT	0	13	0	0
Pyrithiobac + bromoxynil + AG-98	0.031 0.25 0.25%	OT	8	3	0	0
Pyrithiobac + bromoxynil + AG-98	0.031 0.375 0.25%	OT	5	5	0	0
Pyrithiobac + bromoxynil + AG-98	0.031 0.5 0.25%	OT	6	8	0	0
Bromoxynil + AG-98	0.25 0.25%	OT	0	0	0	0
Bromoxynil + AG-98	0.375 0.25%	OT	0	0	0	0
CGA 362622 + AG-98	0.0047 0.25%	OT	7	14	3	0
LSD (0.05)			5	5	1	NS

Table 25. Cotton programs in BXN (bromoxynil-resistant) cotton, Rohwer, 2000.

TEST INFORMATION

Location	Rohwer	Crop / Cultivar	cotton / BXN
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 35 ft	Planting date / Harvest date	May 16, 2000 / N/A
Row width / Number of rows per plot	38 in. / 4	Soil type	silt loam (16% sand, 67% silt, 17% clay)
		% OM / pH	1.1 / 7.1

Comments: PPI = preplant incorporated; PPL = preplant; PRE = preemergence; EPOST = early postemergence over-the-top; and LPOST = late postemergence over-the-top. Herbicide information can be found in Appendix Table 1.

Application

Type	PPI	PPL	PRE	EPOST	LPOST
Date applied	May 16, 2000	May 16, 2000	May 17, 2000	June 8, 2000	June 26, 2000
Time	7:00 am	9:00 am	7:25 am	7:00 am	2:00 pm
Incorporation equipment	Levelband	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	63 / 66	66 / 68	72 / 66	81 / 68	84 / 79
Relative humidity (%)	64	60	82	44	50
Wind (mph)	2	2	7	2	5
Cloud cover (%)	50	50	100	0	0
Soil moisture	optimal	optimal	optimal	optimal	dry
Crop stage/height	N/A	N/A	N/A	2-3 lf / 3"	6-8 lf / 12"
Sprayer type/mph	Tractor / 3	BkPkCO2 / 3	BkPkCO2 / 3	Tractor / 3	Tractor / 3
Nozzle type/size	Flat fan / 8002VS	Flat fan / 8002VS	Flat fan / 8002VS	Flat fan / 8002VS	Air induc. / 11002
Boom ht / # Noz /					
Spacing (in.)	22 / 8 / 19	22 / 8 / 19	22 / 8 / 19	22 / 8 / 19	22 / 8 / 19
Gpa / Psi	15 / 22	15 / 22	15 / 22	15 / 22	15 / 22
Weed species (density)	----- [height (in.)] -----				
ECHCG* (mod.)				3"	9"
AMARE (mod.)				3"	9"
IPOLA (mod.)				3"	9"
SIDSP (mod.)				3"	9"
BRAPP (mod.)				3"	9"

* See Appendix Table 3 for definitions of Bayer codes.

Conclusions: Bromoxynil (Buctril) was applied alone and in combination with herbicides that provide residual activity to evaluate the need for residual activity in BXN weed-control programs. Treatments that included soil residual herbicides improved control of redroot pigweed and common purslane over bromoxynil alone but did not improve pitted morningglory control in BXN cotton programs.

Table 25. Section 1.

Herbicide	Rate (lb ai/A)	Application timing	Weed control					
			Redroot pigweed (AMARE)			Pitted morningglory (IPOLA)		
			6/7	6/29	8/22	6/7	6/29	8/22
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Trifluralin (Treflan) <i>fb</i>	1.0	PPI	100	100	99	99	100	98
fluometuron (Cotoran) <i>fb</i>	0.75	PRE						
bromoxynil (Buctril) <i>fb</i>	0.5	EPOST						
bromoxynil	0.5	LPOST						
Pendimethalin (Prowl) <i>fb</i>	1.0	PPI	100	100	99	98	100	98
fluometuron <i>fb</i>	0.75	PRE						
bromoxynil <i>fb</i>	0.5	EPOST						
bromoxynil	0.5	LPOST						
Pendimethalin <i>fb</i>	0.5	PPL	100	100	99	92	100	98
pendimethalin + fluometuron <i>fb</i>	0.5 0.75	PRE						
bromoxynil <i>fb</i>	0.5	EPOST						
bromoxynil <i>fb</i>	0.5	LPOST						
Trifluralin <i>fb</i>	1.0	PPI	100	100	99	97	100	98
fluometuron + pyrithiobac <i>fb</i>	0.75 0.032	PRE						
bromoxynil <i>fb</i>	0.5	EPOST						
bromoxynil	0.5	LPOST						
Trifluralin <i>fb</i>	1.0	PPI	100	100	99	97	100	98
fluometuron <i>fb</i>	0.75	PRE						
pyrithiobac + bromoxynil <i>fb</i>	0.032 0.5	EPOST						
bromoxynil	0.5	LPOST						
Trifluralin <i>fb</i>	1.0	PPI	100	100	99	100	100	98
flumioxazin (Valor) <i>fb</i>	0.062	PRE						
bromoxynil <i>fb</i>	0.5	EPOST						
bromoxynil	0.5	LPOST						
Pendimethalin <i>fb</i>	1.0	PPL	100	100	99	100	100	98
flumioxazin <i>fb</i>	0.062	PRE						
bromoxynil <i>fb</i>	0.5	EPOST						
bromoxynil	0.5	LPOST						
Trifluralin <i>fb</i>	1.0	PPI	100	100	99	100	100	99
flumioxazin <i>fb</i>	0.062	PRE						
pyrithiobac + bromoxynil <i>fb</i>	0.032 0.5	EPOST						
bromoxynil	0.5	EPOST						
bromoxynil	0.5	LPOST						
Pendimethalin <i>fb</i>	0.825	PPI	100	100	99	93	100	98
pyrithiobac <i>fb</i>	0.032	PRE						
bromoxynil	0.5	EPOST						
Pendimethalin <i>fb</i>	0.825	PPI	100	100	99	94	100	98
pyrithiobac <i>fb</i>	0.032	PRE						
pyrithiobac + bromoxynil	0.032 0.5	EPOST						
bromoxynil	0.5	EPOST						
LSD (0.05)			1	1	1	6	1	2

continued

Table 25. Section 2.

Herbicide	Rate (lb ai/A)	Application timing	Weed control				
			Prickly sida (SIDSP)		Barnyardgrass (ECHCG)		Broadleaf signalgrass (BRAPP)
			6/7	6/29	6/7	6/29	6/7
Untreated check			0	0	0	0	0
Trifluralin (Treflan) <i>fb</i>	1.0	PPI	100	100	100	100	100
fluometuron (Cotoran) <i>fb</i>	0.75	PRE					
bromoxynil (Buctril) <i>fb</i>	0.5	EPOST					
bromoxynil	0.5	LPOST					
Pendimethalin (Prowl) <i>fb</i>	1.0	PPI	100	100	100	100	100
fluometuron <i>fb</i>	0.75	PRE					
bromoxynil <i>fb</i>	0.5	EPOST					
bromoxynil	0.5	LPOST					
Pendimethalin <i>fb</i>	0.5	PPL	100	100	100	99	100
pendimethalin + fluometuron <i>fb</i>	0.5 0.75	PRE					
bromoxynil <i>fb</i>	0.5	EPOST					
bromoxynil <i>fb</i>	0.5	LPOST					
Trifluralin <i>fb</i>	1.0	PPI	100	100	100	100	100
fluometuron + pyrithiobac <i>fb</i>	0.75 0.032	PRE					
bromoxynil <i>fb</i>	0.5	EPOST					
bromoxynil	0.5	LPOST					
Trifluralin <i>fb</i>	1.0	PPI	100	100	99	99	99
fluometuron <i>fb</i>	0.75	PRE					
pyrithiobac + bromoxynil <i>fb</i>	0.032 0.5	EPOST					
bromoxynil	0.5	LPOST					
Trifluralin <i>fb</i>	1.0	PPI	100	100	100	99	100
flumioxazin (Valor) <i>fb</i>	0.062	PRE					
bromoxynil <i>fb</i>	0.5	EPOST					
bromoxynil	0.5	LPOST					
Pendimethalin <i>fb</i>	1.0	PPL	100	100	100	100	100
flumioxazin <i>fb</i>	0.062	PRE					
bromoxynil <i>fb</i>	0.5	EPOST					
bromoxynil	0.5	LPOST					
Trifluralin <i>fb</i>	1.0	PPI	100	100	100	100	100
flumioxazin <i>fb</i>	0.062	PRE					
pyrithiobac + bromoxynil <i>fb</i>	0.032 0.5	EPOST					
bromoxynil	0.5	LPOST					
Pendimethalin <i>fb</i>	0.825	PPI	100	100	93	98	88
pyrithiobac <i>fb</i>	0.032	PRE					
bromoxynil	0.5	EPOST					
Pendimethalin <i>fb</i>	0.825	PPI	100	100	96	100	94
pyrithiobac <i>fb</i>	0.032	PRE					
pyrithiobac + bromoxynil	0.032 0.5	EPOST					
LSD (0.05)			1	1	6	3	6

Table 26. Pigweed control in BXN (bromoxynil-resistant) cotton, Rohwer, 2000.**TEST INFORMATION**

Location	Rohwer	Crop / Cultivar	cotton / BXN 47
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 40 ft	Planting date	May 16, 2000
Row width / Number of rows per plot	38 in. / 4	Soil type ...	Hebert silt loam (16% sand, 67% silt, 17% clay)
		% OM / pH	1.1 / 7.15

Comments: PPI = preplant incorporated; PRE = preemergence; EPOST = early postemergence over-the-top; DIR = post-directed at the 10-leaf cotton stage; and LAYBY = layby stage of cotton. Herbicide information can be found in Appendix Table 1.

Application

Type	PPI	PRE	EPOST	DIR	LAYBY
Date applied	May 15, 2000	May 16, 2000	June 8, 2000	June 20, 2000	July 12, 2000
Time	7:00 am	6:00 am	7:30 am	7:00 am	8:00 am
Incorporation equipment	Levelband	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	63 / 66	74 / 66	84 / 68	86 / 72	80 / 78
Relative humidity (%)	64	82	46	56	45
Wind (mph)	2	7	2	2	2
Cloud cover (%)	50	100	0	0	0
Soil moisture	optimal	optimal	optimal	dry	dry
Crop stage/height	N/A	N/A	2-3 lf / 4"	10 lf / 10"	layby / 26"
Sprayer type/mph	BkPkCO ₂ / 3	Tractor / 3	Tractor / 3	Tractor / 3	Tractor / 3
Nozzle type/size	Flat fan / 8002VS	Flat fan / 8002VS	Flat fan / 8002VS	Flat fan / 8002OC	Flood / TK5
Boom ht / # Noz /					
Spacing (in.)	22 / 8 / 19	22 / 8 / 19	22 / 8 / 19	4 / 8 / 19	4 / 4 / 38
Gpa / Psi	15 / 22	15 / 22	15 / 22	15 / 20	15 / 20
Weed species (density)	-----		[height (in.)] -----		
AMAPA* (light)			6"	16"	22"
IPOLA (light)			6"	16"	22"
SIDSP (light)			6"	16"	22"

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: Bromoxynil (Buctril) was applied alone and in combination with various herbicides to evaluate pigweed control in BXN cotton weed-control programs. Bromoxynil applied alone provided excellent control of pitted morningglory, but did not provide adequate control of pigweed or prickly sida. When pyriithiobac or fluometuron was applied PRE, control of all species was greater than 95%.

Table 26.

Herbicide	Rate (lb ai/A)	Application timing	Weed control					
			Redroot pigweed (AMARE)			Pitted morningglory (IPOLA)		Prickly sida (SIDSP)
			6/7	6/29	8/23	6/29	8/23	6/7
Untreated check			0	0	0	0	0	0
Pendimethalin (Prowl) <i>fb</i>	1.0	PPI	84	90	50	98	93	63
bromoxynil (Buctril) <i>fb</i>	0.5	EPOST						
bromoxynil	0.5	DIR						
Pendimethalin <i>fb</i>	1.0	PPI	100	100	98	100	98	96
prometryn (Caparol) <i>fb</i>	1.0	PRE						
bromoxynil <i>fb</i>	0.5	EPOST						
bromoxynil	0.5	DIR						
Pendimethalin <i>fb</i>	1.0	PPI	100	100	98	100	98	100
pyrithiobac (Staple) <i>fb</i>	0.032	PRE						
bromoxynil <i>fb</i>	0.5	EPOST						
bromoxynil	0.5	DIR						
Pendimethalin <i>fb</i>	1.0	PPI	81	98	90	100	97	66
pyrithiobac +	0.032							
bromoxynil <i>fb</i>	0.5	EPOST						
bromoxynil	0.5	DIR						
Pendimethalin <i>fb</i>	1.0	PPI	100	100	98	99	98	100
fluometuron (Cotoran) <i>fb</i>	1.0	PRE						
bromoxynil <i>fb</i>	0.5	EPOST						
bromoxynil	0.5	DIR						
Pendimethalin <i>fb</i>	1.0	PPI	100	100	98	100	98	100
fluometuron <i>fb</i>	1.0	PRE						
bromoxynil <i>fb</i>	0.5	EPOST						
bromoxynil	0.5	DIR						
Pendimethalin <i>fb</i>	1.0	PPI	100	100	98	100	98	100
fluometuron <i>fb</i>	1.0	PRE						
oxyfluorfen (Goal) +	0.25							
bromoxynil <i>fb</i>	0.5	DIR						
bromoxynil	0.5	EPOST						
Pendimethalin <i>fb</i>	1.0	PPI	100	100	98	98	98	96
pyrithiobac <i>fb</i>	0.032	PRE						
bromoxynil <i>fb</i>	0.5	EPOST						
bromoxynil	0.5	DIR						

continued

Table 26. Continued.

Herbicide	Rate (lb ai/A)	Application timing	Weed control					
			Redroot pigweed (AMARE)			Pitted morningglory (IPOLA)		Prickly sida (SIDSP)
			6/7	6/29	8/23	6/29	8/23	6/7
			----- (%) -----					
Fluometuron <i>fb</i>	1.0	PRE	100	100	97	100	98	100
bromoxynil <i>fb</i>	0.5	EPOST						
bromoxynil	0.5	DIR						
Pendimethalin <i>fb</i>	1.0	PPI	100	100	97	100	98	99
pyrithiobac <i>fb</i>	0.032	PRE						
bromoxynil <i>fb</i>	0.5	EPOST						
bromoxynil <i>fb</i>	0.5	DIR						
diuron (Direx) + MSMA	0.5 2.0	LAYBY						
Pendimethalin <i>fb</i>	1.0	PPI	100	100	98	100	98	100
fluometuron <i>fb</i>	1.0	PRE						
bromoxynil <i>fb</i>	0.5	EPOST						
bromoxynil <i>fb</i>	0.5	DIR						
oxyfluorfen + MSMA	0.25 2.0	LAYBY						
Pendimethalin <i>fb</i>	1.0	PPI	100	100	98	97	98	96
prometryn <i>fb</i>	1.0	PRE						
bromoxynil <i>fb</i>	0.5	EPOST						
bromoxynil <i>fb</i>	0.5	DIR						
prometryn + MSMA	1.0 2.0	LAYBY						
Pendimethalin <i>fb</i>	1.0	PPI	100	100	98	100	98	100
fluometuron <i>fb</i>	1.0	PRE						
bromoxynil <i>fb</i>	0.5	EPOST						
oxyfluorfen + MSMA	0.25 2.0	LAYBY						
Pendimethalin <i>fb</i>	1.0	PPI	100	100	98	100	98	99
pyrithiobac <i>fb</i>	0.032	PRE						
bromoxynil <i>fb</i>	0.5	EPOST						
bromoxynil <i>fb</i>	0.5	DIR						
diuron + MSMA	0.5 2.0	LAYBY						
Pyrithiobac <i>fb</i>	0.032	PRE	100	100	98	100	98	91
pyrithiobac + bromoxynil <i>fb</i>	0.032 0.5	EPOST						
bromoxynil	0.5	DIR						
LSD (0.05)			4	1	1	2	1	15

Table 27. Pyriithiobac (Staple) / fluometuron (Cotoran) rates in BXN (bromoxynil-resistant) cotton, Rohwer, 2000.

TEST INFORMATION

Location	Rohwer	Crop / Cultivar	cotton / BXN 47
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 40 ft	Planting date	May 16, 2000
Row width / Number of rows per plot	38 in. / 4	Soil type ...	Hebert silt loam (16% sand, 67% silt, 17% clay)
		% OM / pH	1.1 / 7.1

Comments: PRE = preemergence; EPOST = over-the-top at the 3-leaf cotton stage; DIR = directed at the 4- to 6-leaf cotton stage. Herbicide information can be found in Appendix Table 1.

Application

Type	PRE	EPOST	DIR
Date applied	May 15, 2000	June 13, 2000	June 22, 2000
Time	8:15 am	8:25 am	4:30 pm
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	74 / 66	86 / 81	86 / 75
Relative humidity (%)	82	64	68
Wind (mph)	7	3	2
Cloud cover (%)	100	0	0
Soil moisture	optimal	dry	dry
Crop stage/height	N/A	2-3 / 6"	4-6 lf / 8"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	Tractor / 3
Nozzle type/size	Flat fan / 8002VS	Flat fan / 8002VS	Flat fan / 8002OC
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19	22 / 8 / 19
Gpa / Psi	15 / 22	15 / 22	15 / 22
Weed species (density)	-----	[height (in.)] -----	
AMARE* (light)		6"	8"
IPOLA (light)		6"	8"
SIDSP (light)		6"	8"
ECHCG (light)		6"	8"
BRAPP (light)		6"	8"

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: Pyriithiobac (Staple) and fluometuron (Cotoran) were applied alone and in tank mixtures to evaluate weed control in BXN cotton weed-control programs. PRE applications of pyriithiobac at 0.063 lb ai/A and fluometuron at 1 lb/A provided greater than 95% control of pigweed, pitted morningglory, and prickly sida. However, fluometuron provided greater than 90% control of barnyardgrass, whereas control with pyriithiobac was less than 60%. All POST combinations of fluometuron, pyriithiobac, bromoxynil, and oxyfluorfen provided excellent control of all species evaluated.

Table 27.

Herbicide	Application Rate timing (lb ai/A)		Weed control							
			Redroot pigweed (AMARE)		Pitted morningglory (IPOLA)		Prickly sida (SIDSP)		Barnyard- grass (ECHCG)	Broadleaf signalgrass (BRAPP)
			6/29	8/22	6/29	8/22	6/29	8/22	6/29	6/29
Untreated check			0	0	0	0	0	0	0	0
Pyrithiobac (Staple)	0.032	PRE	98	95	71	56	99	91	54	46
Pyrithiobac	0.063	PRE	100	91	96	71	100	93	61	60
Pyrithiobac <i>fb</i>	0.032	PRE	100	99	100	95	100	95	56	54
pyrithiobac + bromoxynil (Buctril)	0.032 0.5	EPOST								
Pyrithiobac + fluometuron (Cotoran)	0.032 1.0	PRE	100	100	95	96	100	97	98	97
Pyrithiobac + fluometuron	0.032 0.6	PRE	100	100	73	77	100	95	95	90
Pyrithiobac + fluometuron <i>fb</i>	0.032 1.0	PRE	100	100	100	98	100	97	99	97
pyrithiobac + bromoxynil	0.016 0.5	EPOST								
Pyrithiobac + fluometuron <i>fb</i>	0.032 1.0	PRE	100	100	100	97	100	97	99	96
pyrithiobac + bromoxynil	0.032 0.5	EPOST								
Fluometuron <i>fb</i>	1.0	PRE	100	100	100	98	100	97	99	98
pyrithiobac + bromoxynil	0.032 0.5	EPOST								
Pyrithiobac <i>fb</i>	0.032	PRE	99	99	79	88	100	97	65	60
pyrithiobac + fluometuron	0.032 1.0	DIR								
Fluometuron <i>fb</i>	0.6	PRE	100	100	73	94	97	97	98	97
pyrithiobac + fluometuron	0.032 1.0	DIR								
Fluometuron <i>fb</i>	1.0	PRE	100	98	98	94	100	94	99	98
pyrithiobac + fluometuron	0.032 1.0	DIR								
Fluometuron <i>fb</i>	0.6	PRE	100	98	79	85	100	94	96	93
pyrithiobac + fluometuron	0.042 1.0	DIR								
LSD (0.05)			2	4	21	14	2	5	33	31

Table 28. CGA 362622 in BXN (bromoxynil-resistant) cotton, Rohwer, 2000.

TEST INFORMATION

Location	Rohwer	Crop / Cultivar	cotton / BXN
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 35 ft	Planting date / Harvest date	May 16, 2000 / N/A
Row width / Number of rows per plot	38 in. / 4	Soil type ... Hebert silt loam (16% sand, 67% silt, 17% clay)	
		% OM / pH	1.1 / 7.1

Comments: EPOST = early postemergence over-the-top; MPOST = midpostemergence over-the-top; and LPOST = late postemergence over-the-top. Herbicide information can be found in Appendix Table 1.

Application

	EPOST	MPOST	LPOST
Type			
Date applied	June 7, 2000	June 16, 2000	June 21, 2000
Time	2:00 pm	10:00 am	7:30 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	87 / 77	81 / 77	78 / 77
Relative humidity (%)	44	81	87
Wind (mph)	2	5	3
Cloud cover (%)	0	80	30
Soil moisture	optimal	dry	wet
Crop height	3"	5"	12"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/size	Flat fan / 8002VS	Flat fan / 11002VS	Flat fan / 8002VS
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19	22 / 8 / 19
Gpa / Psi	15 / 22	15 / 22	15 / 22
Weed species (density)		[height (in.)]	
AMAPA* (mod.)	3"	5"	10"
SIDSP (mod.)	3"	5"	10"
SEBEX (mod.)	3"	5"	10"
IPOLA (mod.)	3"	5"	10"
CASOB (mod.)	3"	5"	10"

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: Applications of CGA 362622, pyriithiobac, and bromoxynil were applied alone and in tank mixtures at various rates and growth stages. All treatments provided acceptable control of morningglory and hemp sesbania; however, pigweed, sicklepod, and prickly sida were not controlled with bromoxynil unless treatments included tank mixtures with CGA 362622 or pyriithiobac. Treatments that included sequential applications of bromoxynil tankmixed with CGA 362622 or pyriithiobac provided acceptable control of hemp sesbania, morningglory, pigweed, prickly sida, and sicklepod 50 DAT.

Table 28. Section 1.

Herbicide	Rate (lb ai/A)	Application timing	Weed control									
			Hemp sesbania (SEBEX)			Pitted morningglory (IPOLA)			Palmer amaranth (AMAPA)			
			6/21	6/29	7/27	6/21	6/29	7/27	6/21	6/29	7/27	
Untreated check			0	0	0	0	0	0	0	0	0	0
Bromoxynil (Buctril)	0.5	EPOST	100	100	0	100	100	0	18	43	0	
Bromoxynil + CGA 362622	0.5 0.0047	EPOST	100	100	97	100	100	89	68	49	13	
Bromoxynil + CGA 362622	0.5 0.0071	EPOST	100	100	98	100	100	93	95	91	55	
Bromoxynil + pyrithiobac (Staple)	0.5 0.063	EPOST	100	100	99	100	100	91	93	100	85	
CGA 362622	0.0071	EPOST	98	100	97	93	100	90	58	79	66	
Pyrithiobac	0.063	EPOST	88	100	96	83	90	93	98	99	91	
Bromoxynil	0.5	MPOST	90	99	0	80	100	0	55	25	0	
Bromoxynil + CGA 362622	0.5 0.0071	MPOST	90	100	96	93	98	91	58	89	13	
Bromoxynil + CGA 362622	0.5 0.0094	MPOST	85	100	98	90	100	83	48	91	0	
CGA 362622	0.0094	MPOST	43	100	100	45	100	99	58	93	97	
Pyrithiobac	0.063	MPOST	55	100	99	43	95	97	58	94	97	
Bromoxynil + pyrithiobac	0.5 0.063	MPOST	85	100	96	93	100	90	50	93	66	
Bromoxynil <i>fb</i> bromoxynil	0.5 0.5	EPOST LPOST	100	100	99	98	100	95	50	98	84	
Bromoxynil + CGA 362622 <i>fb</i> bromoxynil <i>fb</i> CGA 362622	0.5 0.0047 0.5 0.0071	EPOST LPOST	100	100	99	100	100	100	68	100	99	
CGA 362622 + bromoxynil <i>fb</i> bromoxynil + CGA 362622	0.0047 0.5 0.0094	EPOST LPOST	100	100	99	100	100	97	81	100	98	
CGA 362622 <i>fb</i> CGA 362622	0.0047 0.0094	EPOST LPOST	95	100	97	93	100	97	53	100	99	
Pyrithiobac <i>fb</i> pyrithiobac	0.063 0.063	EPOST LPOST	100	100	98	95	93	100	85	100	99	
Bromoxynil + pyrithiobac <i>fb</i> bromoxynil + pyrithiobac	0.5 0.063 0.5 0.063	EPOST LPOST	100	100	96	100	100	97	100	100	98	
LSD (0.05)			17	1	3	15	7	5	39	21	19	

continued

Table 28. Section 2.

Herbicide	Rate (lb ai/A)	Application timing	Weed control					
			Prickly sida (SIDSP)			Sicklepod (CASOB)		
			6/21	6/29	7/27	6/21	6/29	7/27
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Bromoxynil (Buctril)	0.5	EPOST	100	78	0	33	75	0
Bromoxynil + CGA 362622	0.5 0.0047	EPOST	100	64	83	90	81	89
Bromoxynil + CGA 362622	0.5 0.0071	EPOST	100	98	93	95	94	91
Bromoxynil + pyrithiobac (Staple)	0.5 0.063	EPOST	100	94	91	78	84	85
CGA 362622	0.0071	EPOST	18	38	0	73	86	91
Pyrithiobac	0.063	EPOST	73	80	78	78	79	19
Bromoxynil	0.5	MPOST	73	74	21	38	73	0
Bromoxynil + CGA 362622	0.5 0.0071	MPOST	58	61	0	50	88	97
Bromoxynil + CGA 362622	0.5 0.0094	MPOST	50	66	0	45	94	98
CGA 362622	0.0094	MPOST	5	0	0	43	86	99
Pyrithiobac	0.063	MPOST	0	84	95	35	65	66
Bromoxynil + pyrithiobac	0.5 0.063	MPOST	48	90	89	40	76	13
Bromoxynil <i>fb</i> bromoxynil	0.5 0.5	EPOST LPOST	100	95	94	18	86	95
Bromoxynil + CGA 362622 <i>fb</i> bromoxynil <i>fb</i> CGA 362622	0.5 0.0047 0.5 0.0071	EPOST LPOST	95	100	98	100	100	100
CGA 362622 + bromoxynil <i>fb</i> bromoxynil + CGA 362622	0.0047 0.5 0.5 0.0094	EPOST LPOST	95	100	97	100	98	85
CGA 362622 <i>fb</i> CGA 362622	0.0047 0.0094	EPOST LPOST	50	81	46	85	96	97
Pyrithiobac <i>fb</i> pyrithiobac	0.063 0.063	EPOST LPOST	100	95	98	73	86	95
Bromoxynil + pyrithiobac <i>fb</i> bromoxynil + pyrithiobac	0.5 0.063 0.5 0.063	EPOST LPOST	100	100	97	78	88	71
LSD (0.05)			28	32	23	29	14	25

Table 29. Clethodim (Select) in BXN (bromoxynil-resistant) cotton, Rohwer, 2000.

TEST INFORMATION

Location	Rohwer	Crop / Cultivar	cotton / BXN
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 35 ft	Planting date / Harvest date	May 16, 2000 / N/A
Row width / Number of rows per plot	38 in. / 4	Soil type	silt loam (16% sand, 67% silt, 17% clay)
		% OM / pH	1.1 / 7.1

Comments: Johnsongrass population is predominantly rhizomes. POST = postemergence. Agri-Dex and ammonium sulfate rates are presented as amount of product per acre (pr/A). Herbicide information can be found in Appendix Table 1.

Application

Type	POST
Date applied	June 28, 2000
Time	2:00 pm
Incorporation equipment	N/A
Air/Soil temperature (F)	90 / 78
Relative humidity (%)	80
Wind (mph)	4
Cloud cover (%)	60
Soil moisture	dry
Crop stage/height	24"
Sprayer type/mph	BkPkCO ₂ / 3
Nozzle type/size	Flat fan / 8002VS
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19
Gpa / Psi	15 / 22
Weed species (density)	[no. of leaves]
ECHCG* (heavy)	10-12 lf
SORHA (heavy)	10-12 lf
BRAPP (heavy)	10-12 lf

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: Clethodim (Select) was applied alone and in combination with bromoxynil, the insecticide Bidrin, and ammonium sulfate and evaluated for control of barnyardgrass, broadleaf signalgrass, and johnsongrass. Clethodim applied alone provided greater than 88% control of all species 33 DAT; however, when ammonium sulfate was added to Select, control of all species was greater than 95%. When Select was tankmixed with bromoxynil, control of barnyardgrass and broadleaf signalgrass decreased to 35% or less, while johnsongrass control remained greater than 85%. There were no differences in control between clethodim alone and the clethodim and Bidrin tank mixture.

Table 29.

Herbicide	Rate (lb ai/A)	Application timing	Weed control					
			Barnyardgrass (ECHCG)		Johnsongrass (SORHA)		Broadleaf signalgrass (BRAPP)	
			7/31	8/22	7/31	8/22	7/31	8/22
Untreated check			0	0	0	0	0	0
Clethodim (Select) + Agri-Dex	0.125 1.0 qt/A	POST	89	95	95	98	91	88
Clethodim + Agri-Dex + ammonium sulfate	0.125 1.0 qt/A 2.5 lb pr/A	POST	98	97	97	99	95	90
Clethodim + Agri-Dex ammonium sulfate + bromoxynil (Buctril)	0.125 1.0 qt/A 2.5 lb pr/A 1.0 pt/A	POST	91	97	93	97	91	91
Clethodim + bromoxynil	0.125 0.25	POST	23	50	89	91	35	53
Clethodim + Bidrin (dicotophos) Agri-Dex	0.125 0.5 1.0 qt/A	POST	91	92	93	95	88	91
Clethodim + bromoxynil + Bidrin + Agri-Dex	0.125 0.25 0.5 1.0 qt/A	POST	81	93	91	97	85	88
LSD (0.05)			14	4	5	3	18	7

Table 30. Post-directed herbicide programs in cotton, Fayetteville, 2000.

TEST INFORMATION	
Location	Fayetteville
Experimental design / replications	RCB / 4
Plot size	3.3 ft x 27 ft
Row width / Number of rows per plot	40 inches / 1
Crop / Cultivar	cotton / DPL 451BR
Seeding rate	4 / ft
Planting date / Harvest date	May 22, 2000 / N/A
Soil type	Taloka silt loam (21% sand, 68% silt, 11% clay)
% OM	1.1

Comments: OT = over-the-top (1-lf cotton); DIR = directed (6- to 7-lf cotton); and LAYBY = at layby stage of cotton (14-node cotton). Weed sizes for DIR and LAYBY timings are from plots treated with glyphosate OT. Herbicide information can be found in Appendix Table 1.

Application

Type	OT	DIR	LAYBY
Date applied	June 7, 2000	June 29, 2000	July 13, 2000
Time	5:00 pm	4:00 pm	7:00 pm
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	80 / 84	78 / 80	82 /
Relative humidity (%)	65	80	68
Wind (mph)	3	1	2
Cloud cover (%)	0	0	0
Soil moisture	moist	wet	moist
Crop stage/height	1 lf / 2.5 in.	6-7 lf / 9 in.	14 node / 28 in.
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/size	Flat fan / XR8002VS	Flat Fan / 0C01	Flat fan / 0C01
Boom ht / # Noz / Spacing (in.)	21 / 2 / 18	6 / 2 / 18	10 / 2 / 28
Gpa / Psi	15 / 26	15 / 26	15 / 35
Weed species (density)	-----[no. of leaves / height (cm.)] -----		
BRAPP* (3/ft ²)		2-5 lf / 3-7 cm	8 lf / 8 cm
DIGSA (3/ft ²)	1-2 lf / >1 cm	2-5 lf / 1-4 cm	8 lf / 8 cm
AMACH (1/ft ²)	cot.-2 lf / 0.5-1 cm	2-7 lf / 2-7 cm	N/A
IPOLA (4/ft ²)	1-2 lf / 3 cm	6-16 lf / 5-14 cm	5-many lf / 6-12 cm
IPOHG (0.5/ft ²)	1-2 lf / 2-3 cm	7 lf / 10 cm	4-many lf / 10 cm
SEBEX (3/ft ²)	1-2 compd. / 2-5 cm	4 lf / 5-9 cm	5-8 lf / 10-20 cm
ABUTH (3/ft ²)	2 lf / 2 cm	5 lf / 8 cm	N/A
SIDSP (2/ft ²)	1-2 lf / 0.5 cm	2-4 lf / 2 cm	8-many lf / 5-8 cm

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: The good early control from glyphosate left primarily only pitted morningglory and a few hemp sesbania and prickly sida plants to control with post-directed treatments. All DIR treatments initially controlled pitted morningglory ⊕93% except for glyphosate or pendimethalin alone or in tank mixture. Regrowth was evident with fomesafen, pendimethalin, and flumioxazin. Layby treatments of flumioxazin, flumioxazin + glyphosate or MSMA, and glyphosate or glyphosate + diuron all gave excellent weed control.

Herbicide Evaluation in Arkansas Cotton, 2000

Table 30. Section 1.

Herbicide	Rate (lb ai/A)	Application timing	Broadleaf signalgrass (BRAPP)			Smooth pigweed (AMACH)		Palmer amaranth (AMAPA)		
			7/6	7/26	8/23	7/6	7/26 & 8/23	7/6	7/26 & 8/23	
			----- (%) -----							
Untreated check			0	0	0	0	0	0	0	
Glyphosate (Roundup Ultra)	1.0	OT	100	100	100	100	100	100	100	
<i>fb</i> glyphosate	0.75	DIR								
Glyphosate <i>fb</i>	1.0	OT	100	100	100	100	100	100	100	
glyphosate + diuron (Direx)	0.75 0.4	DIR								
Glyphosate <i>fb</i>	1.0	OT	100	99	100	100	100	100	100	
oxyfluorfen (Goal) + MSMA (Bueno 6) + AG-98	0.2 1.5 0.25	DIR								
Glyphosate <i>fb</i>	1.0	OT	99	96	95	100	100	100	100	
fomesafen (Reflex) + AG-98	0.25 0.25	DIR								
Glyphosate <i>fb</i>	1.0	OT	100	100	98	100	100	100	100	
fomesafen + MSMA + AG-98	0.25 1.5 0.25	DIR								
Glyphosate <i>fb</i>	1.0	OT	100	100	99	100	100	100	100	
fomesafen + MSMA + AG-98	0.375 1.5 0.25	DIR								
Glyphosate <i>fb</i>	1.0	OT	100	100	100	100	100	100	100	
fomesafen + glyphosate	0.25 0.75	DIR								
Glyphosate <i>fb</i>	1.0	OT	97	89	93	100	99	99	100	
pendimethalin (Prowl) + AG-98	1.0 0.25	DIR								
Glyphosate <i>fb</i>	1.0	OT	100	100	100	100	100	100	100	
pendimethalin + glyphosate	1.0 0.75	DIR								
Glyphosate <i>fb</i>	1.0	OT	98	96	96	100	100	100	100	
flumioxazin (Valor) + AG-98	0.063 0.25	DIR								
Glyphosate <i>fb</i>	1.0	OT		100	100		100		100	
glyphosate <i>fb</i>	0.75	DIR								
flumioxazin + AG-98	0.063 0.25	LAYBY								
Glyphosate <i>fb</i>	1.0	OT		100	100		100		100	
glyphosate <i>fb</i>	0.75	DIR								
flumioxazin + glyphosate + AG-98	0.063 1.0 0.25	LAYBY								
Glyphosate <i>fb</i>	1.0	OT		100	100		100		100	
glyphosate <i>fb</i>	0.75	DIR								
flumioxazin + glyphosate + AG-98	0.063 1.0 0.25	LAYBY								
Glyphosate <i>fb</i>	1.0	OT		100	100		100		100	
glyphosate <i>fb</i>	0.75	DIR								
glyphosate	1.0	LAYBY								
Glyphosate <i>fb</i>	1.0	OT		100	100		100		100	
glyphosate <i>fb</i>	0.75	DIR								
diuron + glyphosate	0.8 1.0	LAYBY								
LSD (0.05)			1	2	2	1	1	1	1	

continued

Table 30. Section 2.

Herbicide	Rate (lb ai/A)	Application timing	Weed control						
			Pitted morningglory (IPOLA)				Hemp sesbania (SEBEX)		
			7/6	7/12	7/26	8/23	7/6	7/26	8/23
			----- (%) -----						
Untreated check			0	0	0	0	0	0	0
Glyphosate (Roundup Ultra) <i>fb</i>	1.0	OT	85	95	95	97	99	100	100
glyphosate	0.75	DIR							
Glyphosate <i>fb</i>	1.0	OT	93	94	97	100	100	100	100
glyphosate + diuron (Direx)	0.75 0.4	DIR							
Glyphosate <i>fb</i>	1.0	OT	98	97	97	96	99	100	100
oxyfluorfen (Goal) + MSMA (Bueno 6) + AG-98	0.2 1.5 0.25	DIR							
Glyphosate <i>fb</i>	1.0	OT	95	90	68	79	100	99	100
fomesafen (Reflex) + AG-98	0.25 0.25	DIR							
Glyphosate <i>fb</i>	1.0	OT	99	92	93	86	100	100	100
fomesafen + MSMA + AG-98	0.25 1.5 0.25	DIR							
Glyphosate <i>fb</i>	1.0	OT	98	100	98	98	100	100	100
fomesafen + MSMA + AG-98	0.375 1.5 0.25	DIR							
Glyphosate <i>fb</i>	1.0	OT	97	98	97	95	100	100	100
fomesafen + glyphosate	0.25 0.75	DIR							
Glyphosate <i>fb</i>	1.0	OT	71	83	59	56	99	97	98
pendimethalin (Prowl) + AG-98	1.0 0.25	DIR							
Glyphosate <i>fb</i>	1.0	OT	85	90	89	95	100	98	100
pendimethalin + glyphosate	1.0 0.75	DIR							
Glyphosate <i>fb</i>	1.0	OT	95	82	73	75	100	97	100
flumioxazin (Valor) + AG-98	0.063 0.25	DIR							
Glyphosate <i>fb</i>	1.0	OT		89	96	97		100	100
glyphosate <i>fb</i>	0.75	DIR							
flumioxazin + AG-98	0.063 0.25	LAYBY							
Glyphosate <i>fb</i>	1.0	OT		81	93	99		100	100
glyphosate <i>fb</i>	0.75	DIR							
flumioxazin + MSMA + AG-98	0.063 1.5 0.25	LAYBY							
Glyphosate <i>fb</i>	1.0	OT		84	97	100		100	100
glyphosate <i>fb</i>	0.75	DIR							
flumioxazin + glyphosate + AG-98	0.063 1.0 0.25	LAYBY							
Glyphosate <i>fb</i>	1.0	OT		83	93	100		100	100
glyphosate <i>fb</i>	0.75	DIR							
glyphosate	1.0	LAYBY							
Glyphosate <i>fb</i>	1.0	OT		81	95	100		100	100
glyphosate <i>fb</i>	0.75	DIR							
diuron + glyphosate	0.8 1.0	LAYBY							
LSD (0.05)			7	12	9	9	1	3	1

continued

Table 30. Section 3.

Herbicide	Rate (lb ai/A)	Application timing	Prickly sida (SIDSP) control			Cotton injury ^z
			7/6	7/26	8/23	7/6
			----- (%) -----			
Untreated check			0	0	0	0
Glyphosate (Roundup Ultra) fb	1.0	OT	100	100	100	0
glyphosate	0.75	DIR				
Glyphosate fb	1.0	OT	100	100	100	3
glyphosate + diuron (Direx)	0.75 0.4	DIR				
Glyphosate fb	1.0	OT	100	100	100	5
oxyfluorfen (Goal) + MSMA (Bueno 6) + AG-98	0.2 1.5 0.25	DIR				
Glyphosate fb	1.0	OT	100	89	96	1
fomesafen (Reflex) + AG-98	0.25 0.25	DIR				
Glyphosate fb	1.0	OT	100	100	100	6
fomesafen + MSMA + AG-98	0.25 1.5 0.25	DIR				
Glyphosate fb	1.0	OT	98	96	98	6
fomesafen + MSMA + AG-98	0.375 1.5 0.25	DIR				
Glyphosate fb	1.0	OT	100	100	100	4
fomesafen + glyphosate	0.25 0.75	DIR				
Glyphosate fb	1.0	OT	99	96	99	3
pendimethalin (Prowl) + AG-98	1.0 0.25	DIR				
Glyphosate fb	1.0	OT	100	100	100	5
pendimethalin + glyphosate	1.0 0.75	DIR				
Glyphosate fb	1.0	OT	100	98	98	3
flumioxazin (Valor) + AG-98	0.063 0.25	DIR				
Glyphosate fb	1.0	OT		100	100	0
glyphosate fb	0.75	DIR				
flumioxazin + AG-98	0.063 0.25	LAYBY				
Glyphosate fb	1.0	OT		100	100	0
glyphosate fb	0.75	DIR				
flumioxazin + MSMA + AG-98	0.063 1.5 0.25	LAYBY				
Glyphosate fb	1.0	OT		100	100	0
glyphosate fb	0.75	DIR				
flumioxazin + glyphosate + AG-98	0.063 1.0 0.25	LAYBY				
Glyphosate fb	1.0	OT		100	100	0
glyphosate fb	0.75	DIR				
glyphosate	1.0	LAYBY				
Glyphosate fb	1.0	OT		100	100	0
glyphosate fb	0.75	DIR				
diuron + glyphosate	0.8 1.0	LAYBY				
LSD (0.05)			2	5	3	4

^z Cotton injury ratings on 7/12, 7/26, and 8/23 were zero.

Table 31. Layby study on cotton, Marianna, 2000.

TEST INFORMATION	
Location	Marianna
Experimental design / replications	RCB / 4
Plot size	12.7 ft x 30 ft
Row width / Number of rows per plot	38 in. / 4
Crop / Cultivar	cotton / Stoneville BT/RR
Seeding rate	12 lb/acre
Planting date	May 11, 2000
Soil type	silt loam (2% sand, 86% silt, 12% clay)
% OM / pH	1.1 / 5.7

Comments: PRE = preemergence; OT = over-the-top at 3- to 4-leaf cotton; DIR = post-directed at 6- to 7-leaf cotton; LAYBY = post-directed at layby (13- to 14-leaf cotton). Herbicide information can be found in Appendix Table 1.

Application

Type	PRE	OT	DIR	LAYBY
Date applied	May 15, 2000	June 7, 2000	June 23, 2000	July 5, 2000
Time	9:30 am	12:00 pm	4:30 pm	2:30 pm
Incorporation equipment	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	65 /	75	86 / 100	93 / 100
Wind (mph)	6	5	5	6
Cloud cover (%)	0	0	0	0
Soil moisture	excessive	adequate	inadequate	inadequate
Crop stage	N/A	3-4 lf	6-7 lf	13-14 lf
Sprayer type/mph	Tractor / 3.5	Tractor / 3.5	Tractor / 4.2	Tractor / 3.1
Nozzle type/size	Flat fan / 8003	Flat fan / 11003	Flat fan / 11002	Flat fan / TKVS2
Gpa / Psi	15 / 22	20 / 27	15 / 22	15 / 27
Weed species	----- (no. of leaves) -----			
SIDSP*		cot. - 2 lf		cot. - 6 lf
GGGAN		1-2 lf		1-4 lf
MOLVE		cot. - 2 lf		
AMASS		cot. - 2 lf		1-6 lf
IPOSS		cot. - 3 lf		cot. - 5 lf

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: Flumioxazin applied alone or with MSMA or glyphosate following an early-season program of pendimethalin + fluometuron PRE *fb* glyphosate at the 4-leaf cotton stage was a good layby treatment, giving 99 to 100% control of all species at 2 WAT. Cloransulam applied layby injured cotton 15 to 25% at 2 WAT, and 6 to 13% injury was still evident in September.

Table 31. Section 1.

Herbicide	Rate (lb ai/A)	Application timing	Weed control						
			Prickly sida (SIDSP)			Smooth pigweed (AMACH)			Carpetweed (MOLVE)
			6/20	7/25	8/16	6/20	7/25	8/16	7/25
Untreated			0	0	0	0	0	0	0
Pendimethalin (Pendimax) + fluometuron (Meturon)	1.0 1.25	PRE	91	99	81	100	97	89	100
Pendimethalin + fluometuron <i>fb</i> glyphosate (Roundup Ultra) <i>fb</i> prometryn (Caparol) + MSMA + AG-98	1.0 1.25 0.75 0.75 2.0 0.5%	PRE PRE OT OT LAYBY	96	100	100	100	100	100	100
Pendimethalin + fluometuron <i>fb</i> glyphosate (RU) <i>fb</i> flumioxazin (Valor) + AG-98	1.0 1.25 0.75 0.063 0.25%	PRE PRE OT LAYBY	97	100	100	100	100	98	100
Pendimethalin + fluometuron <i>fb</i> glyphosate (RU) <i>fb</i> flumioxazin + MSMA + AG-98	1.0 1.25 0.75 0.063 2.0 0.25%	PRE PRE OT LAYBY	93	100	100	100	100	100	100
Pendimethalin + fluometuron <i>fb</i> glyphosate (RU) <i>fb</i> flumioxazin + glyphosate (RU)	1.0 1.25 0.75 0.063 1.0	PRE PRE OT LAYBY	93	100	100	100	100	100	100
Pendimethalin + fluometuron <i>fb</i> glyphosate (Glyphomax Plus) <i>fb</i> cloransulam (FirstRate) + Agri-Dex	1.0 1.25 0.75 0.019 1.2%	PRE PRE OT LAYBY	95	100	99	100	99	96	99
Pendimethalin + fluometuron <i>fb</i> glyphosate (GP) <i>fb</i> prometryn + MSMA + AG-98 <i>fb</i> cloransulam + Agri-Dex	1.0 1.25 0.75 0.5 2.0 0.5% 0.019 1.2%	PRE PRE OT OT DIR LAYBY	93	100	100	100	100	100	100
Pendimethalin <i>fb</i> glyphosate (GP) <i>fb</i> prometryn + MSMA + AG-98 <i>fb</i> cloransulam + Agri-Dex	1.0 0.75 0.5 2.0 0.5% 0.019 1.2%	PRE PRE OT OT DIR LAYBY	80	99	93	100	100	93	100
Pendimethalin <i>fb</i> glyphosate (GP) <i>fb</i> cloransulam + glyphosate (GP)	1.0 0.75 0.019 0.75	PRE PRE OT LAYBY	83	100	99	98	100	100	100
LSD (0.05)			8	1	10	2	1	7	1

continued

Table 31. Section 2.

Herbicide	Rate (lb ai/A)	Application timing	Weed control					
			Pitted and ivyleaf morningglory (IPOSS)			Goosegrass (ELEIN)		Annual grasses (GGGAN ²)
			6/20	7/25	8/16	7/25	8/16	6/20
Untreated			0	0	0	0	0	0
Pendimethalin (Pendimax) + fluometuron (Meturon)	1.0 1.25	PRE	88	80	80	100	84	99
Pendimethalin + fluometuron <i>fb</i>	1.0 1.25	PRE	92	100	99	100	99	100
glyphosate (Roundup Ultra) <i>fb</i> prometryn (Caparol) + MSMA + AG-98	0.75 0.75 2.0 0.5%	OT LAYBY						
Pendimethalin + fluometuron <i>fb</i>	1.0 1.25	PRE	93	100	99	100	97	100
glyphosate (RU) <i>fb</i> flumioxazin (Valor) + AG-98	0.75 0.063 0.25%	OT LAYBY						
Pendimethalin + fluometuron <i>fb</i>	1.0 1.25	PRE	90	100	99	100	98	100
glyphosate (RU) <i>fb</i> flumioxazin + MSMA + AG-98	0.75 0.063 2.0 0.25%	OT LAYBY						
Pendimethalin + fluometuron <i>fb</i>	1.0 1.25	PRE	91	100	100	100	100	100
glyphosate (RU) <i>fb</i> flumioxazin + glyphosate (RU)	0.75 0.063 1.0	OT LAYBY						
Pendimethalin + fluometuron <i>fb</i>	1.0 1.25	PRE	94	98	96	100	93	100
glyphosate (Glyphomax Plus) <i>fb</i> cloransulam (FirstRate) + Agri-Dex	0.75 0.019 1.2%	OT LAYBY						
Pendimethalin + fluometuron <i>fb</i>	1.0 1.25	PRE	91	100	99	100	99	100
glyphosate (GP) <i>fb</i> prometryn + MSMA + AG-98 <i>fb</i> cloransulam + Agri-Dex	0.75 0.5 2.0 0.5% 0.019 1.2%	OT DIR LAYBY						
Pendimethalin <i>fb</i> glyphosate (GP) <i>fb</i> prometryn + MSMA + AG-98 <i>fb</i> cloransulam + Agri-Dex	1.0 0.75 0.5 2.0 0.5% 0.019 1.2%	PRE OT DIR LAYBY	83	96	93	100	84	98
Pendimethalin <i>fb</i> glyphosate (GP) <i>fb</i> cloransulam + glyphosate (GP)	1.0 0.75 0.019 0.75	PRE OT LAYBY	73	96	97	94	99	100
LSD (0.05)			6	10	10	5	14	2

continued

Table 31. Section 3.

Herbicide	Rate	Application timing (lb ai/A)	Weed control		Cotton injury				
			Broadleaf signalgrass (BRAPP)	Spotted spurge (EPHMA)	6/20	7/18	7/25	8/16	9/6
			7/25	9/6	----- (%) -----				
Untreated			0	0	0	0	0	0	0
Pendimethalin (Pendimax) + fluometuron (Meturon)	1.0 1.25	PRE	90	59	5	3	1	0	0
Pendimethalin + fluometuron <i>fb</i> glyphosate (Roundup Ultra) <i>fb</i> prometryn (Caparol) + MSMA + AG-98	1.0 1.25 0.75 0.75 2.0 0.5%	PRE OT LAYBY	100	68	4	6	6	0	0
Pendimethalin + fluometuron <i>fb</i> glyphosate (RU) <i>fb</i> flumioxazin (Valor) + AG-98	1.0 1.25 0.75 0.063 0.25%	PRE OT LAYBY	100	95	4	6	4	0	0
Pendimethalin + fluometuron <i>fb</i> glyphosate (RU) <i>fb</i> flumioxazin + MSMA + AG-98	1.0 1.25 0.75 0.063 2.0 0.25%	PRE OT LAYBY	100	86	3	8	3	0	0
Pendimethalin + fluometuron <i>fb</i> glyphosate (RU) <i>fb</i> flumioxazin + glyphosate (RU)	1.0 1.25 0.75 0.063 1.0	PRE OT LAYBY	100	100	3	4	3	0	3
Pendimethalin + fluometuron <i>fb</i> glyphosate (Glyphomax Plus) <i>fb</i> cloransulam (FirstRate) + Agri-Dex	1.0 1.25 0.75 0.019 1.2%	PRE OT LAYBY	98	64	4	15	11	11	6
Pendimethalin + fluometuron <i>fb</i> glyphosate (GP) <i>fb</i> prometryn + MSMA + AG-98 <i>fb</i> cloransulam + Agri-Dex	1.0 1.25 0.75 0.5 2.0 0.5% 0.019 1.2%	PRE OT DIR LAYBY	100	91	3	19	13	16	9
Pendimethalin <i>fb</i> glyphosate (GP) <i>fb</i> prometryn + MSMA + AG-98 <i>fb</i> cloransulam + Agri-Dex	1.0 0.75 0.5 2.0 0.5% 0.019 1.2%	PRE OT DIR LAYBY	85	94	6	25	18	18	8
Pendimethalin <i>fb</i> glyphosate (GP) <i>fb</i> cloransulam + glyphosate (GP)	1.0 0.75 0.019 0.75	PRE OT LAYBY	100	100	3	18	23	24	13
LSD (0.05)			15	27	8	6	7	4	5

^z GGGAN = annual grasses (early rating) consisting of: large crabgrass (DIGSA), broadleaf signalgrass (BRAPP), and goosegrass (ELEIN).

Table 32. Flumioxazin (Valor) for layby and residual weed control, Rohwer, 2000.**TEST INFORMATION**

Location	Rohwer	Crop / Cultivar	cotton / DP 451 B/RR
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 40 ft	Planting date / Harvest date	May 26, 2000 / Oct. 13, 2000
Row width / Number of rows per plot	38 in. / 4	Soil type	silt loam (16% sand, 67% silt, 17% clay)
		% OM / pH	1.1 / 5.5

Comments: PPI = preplant incorporated; DIR = post-directed at 6- to 8-leaf cotton; and LAYBY = layby stage of cotton. Herbicide information can be found in Appendix Table 1.

Application

Type	PPI	DIR	LAYBY
Date applied	May 25, 2000	June 23, 2000	July 11, 2000
Time	7:30 am	8:00 am	10:00 am
Incorporation equipment	Levelband	N/A	N/A
Air/Soil temperature (F)	80 / 76	80 / 76	85 / 76
Relative humidity (%)	85	85	81
Wind (mph)	2	2	5
Cloud cover (%)	100	10	0
Soil moisture	optimal	dry	dry
Crop stage/height	N/A	6-8 lf / 12"	28"
Sprayer type/mph	Tractor / 3	Tractor / 3	Tractor / 3
Nozzle type/size	Flat fan / 8002VS	Flat fan / 8002 OC	Flood / TK5
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19	5 / 4 / 38
Gpa / Psi	15 / 22	15 / 20	15 / 21
Weed species (density)	-----	[height (in.)] -----	
ECHCG* (mod.)		12"	28"
SIDSP (mod.)		12"	28"

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: Flumioxazin (Valor) alone and in combination with glyphosate and MSMA was compared to cyanazine (Bladex) + MSMA and glyphosate alone for control of redroot pigweed and barnyardgrass. Treatments applied to 6- to 8-leaf cotton included carfentrazone (Aim) at 0.063 lb ai/A and carfentrazone + MSMA. Treatments applied at layby included glyphosate at 1.0 lb ai/A and carfentrazone + glyphosate or MSMA. Carfentrazone + glyphosate and cyanazine + MSMA were better on redroot pigweed than glyphosate alone or carfentrazone + MSMA. Glyphosate, carfentrazone + glyphosate, and cyanazine + MSMA provided greater barnyardgrass control than carfentrazone + MSMA.

Table 32.

Herbicide	Rate (lb ai/A)	Application timing	Weed control		Seedcotton yield 10/13 (lb/A)
			Prickly sida (SIDSP)	Barnyardgrass (ECHCG)	
			8/14	8/14	
			----- (%) -----		
NOTE: Entire test was treated with trifluralin (Treflan) at 0.75 lb ai/A, PPI:					
Untreated check			0	0	2600
Flumioxazin (Valor) + AG-98	0.063 0.25%	DIR	92	84	2463
Flumioxazin + Agri-Dex	0.063 1.0 qt/A	DIR	81	75	2064
Flumioxazin + MSMA + AG-98	0.063 2.0 0.25%	DIR	90	65	2369
Flumioxazin + AG-98	0.063 0.25%	LAYBY	79	76	3165
Flumioxazin + Agri-Dex	0.063 1.0 qt/A	LAYBY	93	76	2831
MSMA + AG-98	2.0 0.25%	LAYBY	55	84	2817
Flumioxazin + MSMA + AG-98	0.063 2.0 0.25%	LAYBY	66	81	2644
Glyphosate (Roundup Ultra)	1.0	LAYBY	69	93	2536
Flumioxazin + glyphosate	0.063 1.0	LAYBY	96	95	2817
Cyanazine (Bladex) + MSMA	1.0 2.0	LAYBY	86	94	2826
V-10080 + AG-98	1.063 0.25%	LAYBY	70	94	2758
V-10080	1.063	LAYBY	74	91	2817
Glufosinate (Liberty)	0.35	DIR	47	82	2721
Glufosinate	0.35	LAYBY	91	85	2453
Glyphosate	0.75	DIR	80	90	3062
LSD (0.05)			40	21	617

Table 33. Efficacy of carfentrazone (Aim) post-directed in cotton, Rohwer, 2000.

TEST INFORMATION	
Location	Rohwer
Experimental design / replications	RCB / 4
Plot size	12.7 ft x 40 ft
Row width / Number of rows per plot	38 in. / 4
Crop / Cultivar	cotton / DP 451 B/RR
Seeding rate	12 lb/acre
Planting date / Harvest date	May 24, 2000 / Oct. 13, 2000
Soil type	silt loam (16% sand, 67% silt, 17% clay)
% OM / pH	1.1 / 5.5

Comments: LAYBY = layby stage of cotton. Herbicide information can be found in Appendix Table 1.

Application	
Type	LAYBY
Date applied	July 11, 2000
Time	10:00 am
Incorporation equipment	N/A
Air/Soil temperature (F)	84 / 76
Relative humidity (%)	78
Wind (mph)	4
Cloud cover (%)	0
Soil moisture	dry
Crop height	24"
Sprayer type/mph	Tractor / 3
Nozzle type/size	Flood / TK5
Boom ht / # Noz / Spacing (in.)	4 / 4 / 38
Gpa / Psi	15 / 18
Weed species (density)	[height (in.)]
IPOLA* (heavy)	20"
SIDSP (heavy)	20"
ECHCG (heavy)	20"
AMARE (heavy)	20"

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: Carfentrazone (Aim) + pyriithiobac (Staple) and flumioxazin (Valor) alone provided greater pitted morningglory and prickly sida control than carfentrazone + MSMA or pyriithiobac alone. Compared to carfentrazone alone, carfentrazone + fluometuron combinations provided greater prickly sida control and similar pitted morningglory control.

Table 33.

Herbicide	Rate (lb ai/A)	Application timing	Weed control						Seed- cotton yield (lb/A)
			Pitted morningglory (IPOLA)		Barnyardgrass (ECHCG)	Prickly sida (SIDSP)		Redroot pigweed (AMARE)	
			7/27	8/25	7/27	7/27	8/25	8/25	
Untreated check			0	0	0	0	0	0	2925
Carfentrazone (Aim) + Agri-Dex	0.015 1%	LAYBY	95	91	0	94	81	98	2964
Carfentrazone + Agri-Dex	0.024 1%	LAYBY	97	90	0	89	86	98	3578
Carfentrazone + fluometuron (Cotoran) + Agri-Dex	0.015 0.75 1%	LAYBY	96	90	86	97	91	97	3092
Carfentrazone + bromoxynil (Buctril) + Agri-Dex	0.015 0.375 1%	LAYBY	96	96	0	97	91	98	3151
Carfentrazone + pyrithiobac (Staple) + Agri-Dex	0.015 0.0625 1%	LAYBY	97	97	95	97	97	97	3510
Carfentrazone + MSMA + Agri-Dex	0.015 2.0 1%	LAYBY	96	88	90	97	88	97	2930
Pyrithiobac + Agri-Dex	0.0625 1%	LAYBY	91	89	21	91	88	98	2949
Flumioxazin (Valor) + Agri-Dex	0.063 1%	LAYBY	98	96	21	98	93	98	3421
LSD (0.05)			3	5	28	3	8	1	NS

Table 34. Harvade (dimethipin) in combination with residual post-directed herbicides, Rohwer, 2000.**TEST INFORMATION**

Location	Rohwer	Crop / Cultivar	cotton / DP 451 B/RR
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 35 ft	Planting date / Harvest date	May 24, 2000 / Oct. 12, 2000
Row width / Number of rows per plot	38 in. / 4	Soil type	silt loam (16% sand, 67% silt, 17% clay)
		% OM / pH	1.1 / 5.5

Comments: LAYBY = layby stage of cotton. Herbicide information can be found in Appendix Table 1.

Application

Type	LAYBY
Date applied	July 10, 2000
Time	10:00 am
Incorporation equipment	N/A
Air/Soil temperature (F)	83 / 74
Relative humidity (%)	73
Wind (mph)	5
Cloud cover (%)	0
Soil moisture	dry
Crop height	24"
Sprayer type/mph	Tractor / 3
Nozzle type/size	Flood / TK5
Boom ht / # Noz / Spacing (in.)	4" / 4 / 38
Gpa / Psi	15 / 18
Weed species (density)	[height (in.)]
IPOLA* (heavy)	18"
SIDSP (heavy)	18"
ECHCG (heavy)	18"

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: Harvade (dimethipin) with and without prometryn (Caparol), fluometuron (Cotoran), and diuron (Direx) was evaluated for effectiveness when applied post-directed at layby. Treatments included Harvade at 0.25 and 0.40 lb ai/A in combination with prometryn at 0.5 lb/A, fluometuron at 0.8 lb/A, and diuron at 1.6 lb ai/A, and MSMA. Harvade + fluometuron provided 95% pitted morningglory control and was equal to Harvade + diuron and Harvade + MSMA. Adding Harvade to tank mixtures of prometryn, fluometuron, or diuron with MSMA did not improve control of pitted morningglory or prickly sida.

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Table 34.

Herbicide	Rate (lb ai/A)	Application timing	Weed control					Seed- cotton yield (lb/A)
			Pitted morningglory (IPOLA)		Prickly sida (SIDSP)		Barnyardgrass (ECHCG)	
			7/27	8/25	7/27	8/25	7/27	
Untreated check			0	0	0	0	0	3588
Dimethipin (Harvade) + prometryn (Caparol) + Agri-Dex	0.234 0.5 1.0 pt/A	LAYBY	91	93	95	95	90	3765
Dimethipin + fluometuron (Cotoran) + Agri-Dex	0.234 0.8 1.0 pt/A	LAYBY	95	97	95	98	95	3790
Dimethipin + diuron (Direx) Agri-Dex	0.234 0.8 1.0 pt/A	LAYBY	97	97	98	97	96	3770
Prometryn + MSMA	0.5 2.0	LAYBY	97	94	99	95	96	3584
Diuron + MSMA	0.5 2.0	LAYBY	97	97	99	98	98	3613
MSMA + dimethipin + Agri-Dex	2.0 0.4 1.0 pt/A	LAYBY	99	93	99	94	96	3544
Fluometuron + MSMA	0.8 2.0	LAYBY	99	97	99	98	99	3814
Dimethipin + MSMA + fluometuron + Agri-Dex	0.234 2.0 0.8 1.0 pt/A	LAYBY	99	97	99	95	99	3598
Dimethipin + MSMA + prometryn + Agri-Dex	0.234 2.0 0.5 1.0 pt/A	LAYBY	98	93	99	91	98	3633
Dimethipin + MSMA + diuron + Agri-Dex	0.234 2.0 0.8 1.0 pt/A	LAYBY	99	95	99	97	97	3593
LSD (0.05)			3	3	2	2	4	NS

Table 35. Harvade (dimethipin) tank mixtures for layby control, Rohwer, 2000.**TEST INFORMATION**

Location	Rohwer	Crop / Cultivar	cotton / DP 451 B/RR
Experimental design / replications	RCB / 4	Seeding rate	12 lb/acre
Plot size	12.7 ft x 40 ft	Planting date / Harvest date	May 24, 2000 / Oct. 12, 2000
Row width / Number of rows per plot	38 in. / 4	Soil type	silt loam (16% sand, 67% silt, 17% clay)
		% OM / pH	1.1 / 5.5

Comments: LAYBY = layby stage of cotton. Herbicide information can be found in Appendix Table 1.

Application

Type	LAYBY
Date applied	July 17, 2000
Time	8:00 am
Incorporation equipment	N/A
Air/Soil temperature (F)	80 / 80
Relative humidity (%)	64
Wind (mph)	2
Cloud cover (%)	0
Soil moisture	dry
Crop stage/height	12-14 lf / 24"
Sprayer type/mph	Tractor / 3
Nozzle type/size	Flood / TKS
Boom ht / # Noz / Spacing (in.)	4 / 4 / 38
Gpa / Psi	15 / 19
Weed species (density)	[height (in.)]
IPOLA* (heavy)	18"
ECHCG (heavy)	18"
SIDSP (heavy)	18"

* See Appendix Table 3 for definition of Bayer codes.

Conclusions: Harvade (dimethipin, a cotton harvest-aid) was evaluated in combination with glyphosate, carfentrazone (Aim), and MSMA for control of pitted mornigg glory and prickly sida. Treatments included Harvade + glyphosate, MSMA, or carfentrazone (Aim) and glyphosate alone. Tank mixtures with Harvade did not improve pitted morningglory or prickly sida control over control with glyphosate alone.

Table 35.

Herbicide	Rate (lb ai/A)	Application timing	Weed control					Seed- cotton yield (lb/A)
			Pitted morningglory (IPOLA)		Prickly sida (SIDSP)		Barnyardgrass (ECHCG)	
			7/27	8/25	7/27	8/25	7/27	
Untreated check			0	0	0	0	0	3908
Carfentrazone (Aim) + glyphosate (Roundup Ultra) + Agri-Dex	0.008 0.75 1.0 pt/A	LAYBY	94	97	97	98	84	3392
Carfentrazone + glyphosate + Agri-Dex	0.015 0.75 1.0 pt/A	LAYBY	93	94	92	94	85	3667
Glyphosate + Agri-Dex	0.75 1.0 pt/A	LAYBY	82	98	89	98	88	4016
Dimethipin (Harvade) + glyphosate + Agri-Dex	0.4 0.75 1.0 pt/A	LAYBY	86	95	91	95	78	3841
Dimethipin + glyphosate Agri-Dex	0.234 0.75 1.0 pt/A	LAYBY	84	86	91	88	75	3957
Dimethipin + glyphosate	0.234 0.75	LAYBY	76	88	91	90	73	3588
Glyphosate	0.75	LAYBY	76	83	91	85	79	3748
Dimethipin + MSMA + Agri-Dex	0.234 2.0 1.0 pt/A	LAYBY	85	92	81	93	83	3854
Dimethipin + glyphosate	0.4 0.75	LAYBY	71	94	79	95	78	3854
LSD (0.05)			16	5	16	4	22	NS

Table 36. Transgenic cotton in ultra-narrow row, Marianna, 2000.

TEST INFORMATION

Location	Marianna	Crop / Cultivar	cotton / several
Experimental design / replications	RCB / 4	Planting date / Harvest date	May 16, 2000 /
Plot size	10 ft x 40 ft	Soil type	silt loam (2% sand, 86% silt, 12% clay)
Row width	UNR =7.5 in.; conventional = 38 in.		

Comments: PRE-C = preemergence on conventionally spaced rows; PRE-UNR = preemergence on ultra-narrow row spacing; 1-2 LF = 1- to 2-lf cotton (applied to plots without PRE treatments); 1-3 LF/EDIR = 1- to 3-lf cotton (applied to plots with PRE treatments and to the standard early directed treatment); 6-8 LF = 6- to 8-lf cotton; LDIR = late directed; and A/N = as needed (all were applied). Herbicide information can be found in Appendix Table 1.

Application

Type	PRE-C	PRE-UNR	1-2 LF	1-3 LF/EDIR	6-8 LF	LDIR	A/N
Date applied	5/16/00	5/16/00	5/31/00	6/7/00	6/27/00	7/11/00	7/11/00
Time	8:20 am	9:00 am	1:00 pm	6:00 pm	8:00 pm	9:00 pm	9:00 pm
Incorporation equipment	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Air/soil temperature (F)	76 / 76	76 / 76	90 / 90	81 / 80	N/A	82 / 82	82 / 82
Relative humidity (%)	50	50	47	54	N/A	52	52
Wind (mph)	5	5	4	1	N/A	1	1
Cloud cover (%)	100	100	5	5	N/A	10	10
Soil moisture	moist	moist	moist	moist	N/A	moist	moist
Crop stage	N/A	N/A	1-2 lf / 1.5"	1-3 lf / 3"	N/A	N/A	N/A
Sprayer type/mph	Tractor / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	N/A	tractor	BkPkCO ₂ / 3
Nozzle type/size	8003	11003	11003	11003	N/A	N/A	11003
Boom ht / # Noz /							
Spacing (in.)	19 / 8 / 19	15 / 8 / 19	12 / 8 / 19	12 / 8 / 19	N/A	N/A	15 / 8 / 19
Gpa	20	20	20	20	N/A	20	20

Conclusions: Control of Palmer amaranth was ⊕95% with all treatments except the bromoxynil (Buctril) total POST program in the conventional row spacing, which controlled Palmer amaranth only 26%. This could be due to Staple-resistant Palmer amaranth. Possible resistance will be tested in the greenhouse. Prickly sida control was excellent for all treatments (96%). The bromoxynil total POST program in ultra-narrow rows resulted in poorer control of entireleaf (86%) and pitted morningglory (84%) than other treatments, which controlled morningglories 90%.

Table 36. Section 1.

Herbicide	Application		Weed control							
	Rate (lb/A)	timing	Palmer amaranth (AMAPA)				Prickly sida (SIDSP)			
			5/31	7/11	7/25	8/9	5/31	7/11	7/25	8/9
----- (%) -----										
Ultra-narrow row cotton:										
Glyphosate (Roundup Ultra) fb glyphosate (PM1218 BG/RR)	1.0	1-2 LF	100	100	99	100	100	100	99	99
	1.0	6-8 LF								
Fluometuron (Cotoran) + metolachlor (Dual Magnum) fb glyphosate fb pyriithiobac (Staple) + clethodim (Select) Agri-Dex (PM1218 BG/RR)	1.0 0.75	PRE	100	100	99	100	100	99	99	100
	1.0	1-3 LF								
	0.062									
	0.25									
	1%	A/N								
Glyphosate fb glyphosate (DP451 B/RR)	1.0	1-2 LF	99	99	99	100	99	94	99	96
	1.0	6-8 LF								
Fluometuron + metolachlor fb glyphosate fb pyriithiobac + clethodim + Agri-Dex (DP451 B/RR)	1.0 0.75	PRE	100	100	99	100	100	100	99	98
	1.0	1-3 LF								
	0.062									
	0.25									
	1%	A/N								
Glyphosate fb glyphosate (SX215 BG/RR)	1.0	1-2 LF	100	100	99	100	100	98	98	96
	1.0	6-8 LF								
Fluometuron + metolachlor fb glyphosate fb pyriithiobac + clethodim + Agri-Dex (SX215 BGRR)	1.0 0.75	PRE	100	100	99	100	100	100	99	99
	1.0	1-3 LF								
	0.062									
	0.25									
	1%	A/N								
Bromoxynil (Buctril) + pyriithiobac fb clethodim + Agri-Dex (BXN47)	0.25 0.047	1-2 LF	96	92	99	95	96	96	99	98
	0.25									
	1%	A/N								
Fluometuron + metolachlor fb bromoxynil + pyriithiobac fb clethodim + Agri-Dex (BXN47)	1.0 0.75	PRE	100	100	99	100	100	100	99	100
	1.0	1-3 LF								
	0.047									
	0.25									
	1%	A/N								
Fluometuron + metolachlor fb pyriithiobac (STS474)	1.0 0.75	PRE	100	100	99	99	100	99	98	96
	0.062	A/N								
Weedy check (STS474)			0	0	0	0	0	0	0	0

continued

Table 36. Section 1. Continued.

Herbicide	Application		Weed control							
			Palmer amaranth (AMAPA)				Prickly sida (SIDSP)			
	Rate (lb/A)	timing	5/31	7/11	7/25	8/9	5/31	7/11	7/25	8/9
			----- (%) -----							
Conventional row spacing:										
Glyphosate fb	1.0	1-2 LF	100	100	99	99	100	100	99	98
glyphosate (PM1218 BG/RR)	1.0	6-8 LF								
Fluometuron + metolachlor fb	1.0 0.75	PRE	98	98	92	96	98	100	99	100
glyphosate fb	1.0	1-3 LF/EDIR								
pyrithiobac + clethodim + Agri-Dex (PM1218 BG/RR)	0.062 0.25 1%	A/N								
Bromoxynil + pyrithiobac fb	0.25 0.047	1-2 LF	55	48	34	26	84	100	98	100
clethodim + Agri-Dex (BXN47)	0.25 1%	A/N								
Fluometuron + metolachlor fb	1.0 0.75	PRE	95	97	90	90	95	100	99	100
bromoxynil + pyrithiobac fb	1.0 0.047	1-3 LF								
clethodim + Agri-Dex (BXN47)	0.25 1%	A/N								
Fluometuron + metolachlor fb	1.0 0.75	PRE	100	98	98	100	100	100	99	100
fluometuron + MSMA + diuron (Direx) fb	1.0 2.0	EDR 3-6"								
MSMA + diuron (STS474)	2.0	LDR 6">								
Weedy check (STS474)			0	0	0	0	0	0	0	0
LSD (0.05)			15	5	11	5	5	2	1	4

continued

Table 36. Section 2.

Herbicide	Application		Weed control							
	Rate (lb/A)	timing	Entireleaf morningglory (IPOHG)				Pitted morningglory (IPOLA)			
			5/31	7/11	7/25	8/9	5/31	7/11	7/25	8/9
----- (%) -----										
Ultra-narrow row cotton:										
Glyphosate (Roundup Ultra) fb glyphosate (PM1218 BG/RR)	1.0	1-2 LF	95	95	99	95	91	85	98	91
Fluometuron (Cotoran) + metolachlor (Dual Magnum) fb glyphosate fb pyriithiobac (Staple) + clethodim (Select) Agri-Dex (PM1218 BG/RR)	1.0 0.75	PRE	100	100	99	98	99	99	99	95
Glyphosate fb glyphosate (DP451 B/RR)	1.0	1-2 LF	94	94	99	91	65	69	96	91
Fluometuron + metolachlor fb glyphosate fb pyriithiobac + clethodim + Agri-Dex (DP451 B/RR)	1.0 0.75	PRE	100	100	99	98	99	100	100	95
Glyphosate fb glyphosate (SX215 BG/RR)	1.0	1-2 LF	97	99	99	94	92	88	96	90
Fluometuron + metolachlor fb glyphosate fb pyriithiobac + clethodim + Agri-Dex (SX215 BGRR)	1.0 0.75	PRE	100	100	99	99	100	100	100	94
Bromoxynil (Buctril) + pyriithiobac fb clethodim + Agri-Dex (BXN47)	0.25 0.047	1-2 LF	96	94	92	86	91	80	90	84
Fluometuron + metolachlor fb bromoxynil + pyriithiobac fb clethodim + Agri-Dex (BXN47)	1.0 0.75	PRE	100	100	99	98	100	100	100	95
Fluometuron + metolachlor fb pyriithiobac (STS474)	1.0 0.75	PRE	97	96	94	94	97	90	97	91
Weedy check (STS474)			0	0	0	0	0	0	0	0

continued

Table 36. Section 2. Continued.

Herbicide	Application		Weed control							
			Entireleaf morningglory (IPOHG)				Pitted morningglory (IPOLA)			
			5/31	7/11	7/25	8/9	5/31	7/11	7/25	8/9
	Rate (lb/A)	timing	----- (%) -----							
Conventional row spacing:										
Glyphosate fb	1.0	1-2 LF	98	100	99	94	92	91	98	91
glyphosate (PM1218 BG/RR)	1.0	6-8 LF								
Fluometuron + metolachlor fb	1.0 0.75	PRE	100	100	99	95	100	100	100	92
glyphosate fb	1.0	1-3 LF								
pyrithiobac + clethodim + Agri-Dex (PM1218 BG/RR)	0.062 0.25 1%	A/N								
Bromoxynil + pyrithiobac fb clethodim + Agri-Dex (BXN47)	0.25 0.047 0.25 1%	1-2 LF A/N	100	100	98	98	97	100	100	95
Fluometuron + metolachlor fb	1.0 0.75	PRE	100	100	98	98	100	100	100	94
bromoxynil + pyrithiobac fb clethodim + Agri-Dex (BXN47)	1.0 0.047 0.25 1%	1-3 LF A/N								
Fluometuron + metolachlor fb	1.0 0.75	PRE	100	100	99	99	100	100	100	95
fluometuron + MSMA + diuron (Direx) fb	1.0 2.0	EDR 3-6"								
MSMA + diuron (STS474)	2.0	LDR 6">								
Weedy check (STS474)			0	0	0	0	0	0	0	0
LSD (0.05)			5	7	6	6	17	11	4	5

continued

Table 36. Section 3.

Herbicide	Application		Weed control							
	Rate (lb/A)	timing	Large crabgrass (DIGSA)				Goosegrass (ELEIN)			
			5/31	7/11	7/25	8/9	5/31	7/11	7/25	8/9
----- (%) -----										
Ultra-narrow row cotton:										
Glyphosate (Roundup Ultra) fb glyphosate (PM1218 BG/RR)	1.0	1-2 LF	100	100	100	96	100	100	100	96
Fluometuron (Cotoran) + metolachlor (Dual Magnum) fb glyphosate fb pyriithiobac (Staple) + clethodim (Select) Agri-Dex (PM1218 BG/RR)	1.0 0.75 1.0 0.062 0.25 1%	PRE 1-3 LF A/N	100	100	100	95	100	100	100	95
Glyphosate fb glyphosate (DP451 B/RR)	1.0 1.0	1-2 LF 6-8 LF	100	100	100	95	100	100	100	95
Fluometuron + metolachlor fb glyphosate fb pyriithiobac + clethodim + Agri-Dex (DP451 B/RR)	1.0 0.75 1.0 0.062 0.25 1%	PRE 1-3 LF A/N	100	100	100	95	100	100	100	95
Glyphosate fb glyphosate (SX215 BG/RR)	1.0 1.0	1-2 LF 6-8 LF	98	98	100	95	99	99	100	95
Fluometuron + metolachlor fb glyphosate fb pyriithiobac + clethodim + Agri-Dex (SX215 BGRR)	1.0 0.75 1.0 0.062 0.25 1%	PRE 1-3 LF A/N	100	100	100	95	100	100	100	95
Bromoxynil (Buctril) + pyriithiobac fb clethodim + Agri-Dex (BXN47)	0.25 0.047 0.25 1%	1-2 LF A/N	92	85	89	80	99	94	94	92
Fluometuron + metolachlor fb bromoxynil + pyriithiobac fb clethodim + Agri-Dex (BXN47)	1.0 0.75 1.0 0.047 0.25 1%	PRE 1-3 LF A/N	100	100	100	95	100	100	99	95
Fluometuron + metolachlor fb pyriithiobac (STS474)	1.0 0.75 0.062	PRE A/N	100	100	99	95	100	100	100	95
Weedy check (STS474)			0	0	0	0	0	0	0	0

continued

Table 36. Section 3. Continued.

Herbicide	Application		Weed control							
			Large crabgrass (DIGSA)				Goosegrass (ELEIN)			
	Rate (lb/A)	timing	5/31	7/11	7/25	8/9	5/31	7/11	7/25	8/9
			----- (%) -----							
Conventional row spacing:										
Glyphosate fb	1.0	1-2 LF	100	100	100	95	100	100	100	95
glyphosate (PM1218 BG/RR)	1.0	6-8 LF								
Fluometuron + metolachlor fb	1.0 0.75		100	100	100	94	100	100	100	94
glyphosate fb	1.0	PRE								
pyrithiobac + clethodim + Agri-Dex (PM1218 BG/RR)	0.062 0.25 1%	1-3 LF A/N								
Bromoxynil + pyrithiobac fb	0.25 0.047	1-2 LF	89	78	85	80	91	78	91	91
clethodim + Agri-Dex (BXN47)	0.25 1%	A/N								
Fluometuron + metolachlor fb	1.0 0.75		100	99	100	95	100	100	100	95
bromoxynil + pyrithiobac fb	1.0 0.047	PRE 1-3 LF								
clethodim + Agri-Dex (BXN47)	0.25 1%	A/N								
Fluometuron + metolachlor fb	1.0 0.75		98	100	99	95	100	100	100	95
fluometuron + MSMA + diuron (Direx) fb	1.0 2.0	PRE EDR 3-6"								
MSMA + diuron (STS474)	2.0	LDR 6">								
Weedy check (STS474)			0	0	0	0	0	0	0	0
LSD (0.05)			5	7	5	6	4	7	4	3

continued

Table 36. Section 4.

Herbicide	Rate (lb/A)	Application timing	Effect on cotton		
			Cotton injury		Seedcotton yield
			5/31	7/11	10/4
			----- (%) -----		(lb/A)
Ultra-narrow row cotton:					
Glyphosate (Roundup Ultra) fb glyphosate (PM1218 BG/RR)	1.0 1.0	1-2 LF 6-8 LF	0	8	1122
Fluometuron (Cotoran) + metolachlor (Dual Magnum) fb glyphosate fb pyrithiobac (Staple) + clethodim (Select) Agri-Dex (PM1218 BG/RR)	1.0 0.75 1.0 0.062 0.25 1%	PRE 1-3 LF A/N	0	0	2508
Glyphosate fb glyphosate (DP451 B/RR)	1.0 1.0	1-2 LF 6-8 LF	0	4	1035
Fluometuron + metolachlor fb glyphosate fb pyrithiobac + clethodim + Agri-Dex (DP451 B/RR)	1.0 0.75 1.0 0.062 0.25 1%	PRE 1-3 LF A/N	0	0	2048
Glyphosate fb glyphosate (SX215 BG/RR)	1.0 1.0	1-2 LF 6-8 LF	0	0	1382
Fluometuron + metolachlor fb glyphosate fb pyrithiobac + clethodim + Agri-Dex (SX215 BGRR)	1.0 0.75 1.0 0.062 0.25 1%	PRE 1-3 LF A/N	0	2	2378
Bromoxynil (Buctril) + pyrithiobac fb clethodim + Agri-Dex (BXN47)	0.25 0.047 0.25 1%	1-2 LF A/N	0	0	1457
Fluometuron + metolachlor fb bromoxynil + pyrithiobac fb clethodim + Agri-Dex (BXN47)	1.0 0.75 1.0 0.047 0.25 1%	PRE 1-3 LF A/N	0	0	1723
Fluometuron + metolachlor fb pyrithiobac (STS474)	1.0 0.75 0.062	PRE A/N	0	0	1512
Weedy check (STS474)			0	0	0

continued

Table 36. Section 4. Continued.

Herbicide	Rate (lb/A)	Application timing	Effect on cotton		
			Cotton injury		Seedcotton yield
			5/31	7/11	10/4
			----- (%) -----		(lb/A)
Conventional row spacing:					
Glyphosate fb	1.0	1-2 LF	0	0	363
glyphosate (PM1218 BG/RR)	1.0	6-8 LF			
Fluometuron + metolachlor fb	1.0 0.75	PRE	0	0	1203
glyphosate fb	1.0	1-3 LF			
pyrithiobac + clethodim + Agri-Dex (PM1218 BG/RR)	0.062 0.25 1%	A/N			
Bromoxynil + pyrithiobac fb	0.25 0.047	1-2 LF	0	0	238
clethodim + Agri-Dex (BXN47)	0.25 1%	A/N			
Fluometuron + metolachlor fb	1.0 0.75	PRE	0	0	753
bromoxynil + pyrithiobac fb	1.0 0.047	1-3 LF			
clethodim + Agri-Dex (BXN47)	0.25 1%	A/N			
Fluometuron + metolachlor fb	1.0 0.75	PRE	0	0	536
fluometuron + MSMA + diuron (Direx) fb	1.0 2.0	EDR 3-6"			
MSMA + diuron (STS474)	2.0	LDR 6">			
Weedy check (STS474)			0	0	0
LSD (0.05)			NS	NS	462

Appendix Table 1. Common and trade names, formulation (pounds of active ingredient or acid equivalent per gallon), sponsoring companies, and chemical names of herbicides.^z

Common name	Trade name (formulation ^y)	Company	Chemical name
AG-98	non-ionic surfactant	Rohm and Haas	--
Agri-Dex	crop oil concentrate	Setre (Helena)	--
bromoxynil	Buctril (4 EC)	Rhone-Poulenc	3,5-dibromo-4-hydroxybenzotrile
carfentrazone	Aim (40 DF)	FMC	α ,2-dichloro-5-[4-(difluoromethyl)-4,5-dihydro-3-methyl-5-oxo-1 <i>H</i> -1,2,4-triazol-1-yl]-4-fluorobenzenepropanoic acid
CGA-362622	-- (75 DF)	Novartis	--
clethodim	Select (2 EC)	Valent	(<i>E,E</i>)-(±)-2-[1-[[[(3-chloro-2-propenyl)oxy]imino]propyl]-5-[2-(ethylthio)propyl]-3-hydroxy-2-cyclohexen-1-one
cloransulam	FirstRate (84 DF)	Dow AgroSciences	3-chloro-2-[[[(5-ethoxy-7-fluoro[1,2,4]triazolo[1,5- <i>c</i>]pyrimidin-2yl)sulfonyl]amino]benzoic acid
cloransulam + flumetsulam	Frontrow (co-pack of 84 DF + 80 DF)	Dow AgroSciences	(see cloransulam) + <i>N</i> -(2,6-difluorophenyl)-5-methyl[1,2,4]triazolo[1,5- α]pyrimidine-2-sulfonamide
cyanazine	Bladex (4 F)	DuPont	2-[[4-chloro-6-(ethylamino)-1,3,5-triazin-2-yl]amino]-2-methylpropanenitrile
dimethipin	Harvade (5 F)	Uniroyal	2,3-dihydro-5,6-dimethyl-1,4-dithiin-1,1,4,4-tetraoxide
diuron	Direx (80 DF)	Griffin	<i>N'</i> -(3,4-dichlorophenyl)- <i>N,N</i> -dimethylurea
DPX-AEA46	Staple Plus	DuPont	see pyriithiobac + glyphosate
fluazifop-P	Fusilade DX (2 EC)	Zeneca	(<i>R</i>)-2-[4-[[5-(trifluoromethyl)-2-pyridinyl]oxy]phenoxy]propanoic acid
flumioxazin (formerly V-53482)	Valor (50 DF)	Valent	2-[7-fluoro-3,4-dihydro-3-oxo-4-(2-propynyl)-2 <i>H</i> -1,4-benzoxazin-6-yl]-4,5,6,7-tetrahydro-1 <i>H</i> -isoindole-1,3(2 <i>H</i>)-dione
fluometuron	Cotoran (4 F); Meturon (4 F)	Griffin	<i>N,N</i> -dimethyl- <i>N'</i> -[3-(trifluoromethyl)phenyl]urea
fomesafen	Reflex (2 EC)	Zeneca	5-[2-chloro-4-(trifluoromethyl)phenoxy]- <i>N</i> -(methylsulfonyl)-2-nitrobenzamide
glufosinate	Liberty (1.67 SC)	Aventis	2-amino-4-(hydroxymethylphosphinyl)butanoic acid
glyphosate	Roundup Ultra (4 SL ai; 3 SL ae); Touchdown (3 SL ae)	Monsanto	<i>N</i> -(phosphonomethyl)glycine
metolachlor	Dual Magnum (7.62 EC)	Novartis	2-chloro- <i>N</i> -(2-ethyl-6-methylphenyl)- <i>N</i> -(2-methoxy-1-methylethyl)acetamide
MSMA (contains surfactant)	Bueno 6 (6 SL)	Zeneca	monosodium salt of MAA
oxyfluorfen	Goal 2XL (2 EC)	Rohm and Haas	2-chloro-1-(3-ethoxy-4-nitrophenoxy)-4-(trifluoromethyl)benzene
pendimethalin	Prowl (3.3 EC); Pendimax (3.3 EC)	American Cyanamid; Dow AgroSciences	<i>N</i> -(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine
prometryn	Caparol, Cotton Pro (4 F)	Novartis, Griffin	<i>N,N'</i> -bis(1-methylethyl)-6-(methylthio)-1,3,5-triazine-2,4-diamine
pyriithiobac	Staple (85 SP)	DuPont	2-chloro-6-[[4,6-dimethoxy-2-pyrimidinyl]thio]benzoic acid

continued

Appendix Table 1. Continued.

Common name	Trade name (formulation ^y)	Company	Chemical name
pyrithiobac + glyphosate	Staple Plus	DuPont	see pyrithiobac and glyphosate
quizalofop p-ethyl	Assure II (0.88 EC)	DuPont	(±)-2-[4-[(6-chloro-2-quinoxalinyloxy]phenoxy]propanoic acid
sethoxydim	Poast Plus (1 EC)	BASF	2-[1-(ethoxyimino)butyl]-5-[2-(ethylthio)propyl]-3-hydroxy-2-cyclohexen-1-one
trifluralin	Treflan (4 EC)	Dow AgroSciences	2,6-dinitro- <i>N,N</i> -dipropyl-4-(trifluoromethyl)benzenamine
V-10080	-- (4.25 SC)	Valent	--

^z '-' indicates information is not available or not applicable.

^y Formulations are followed by amount of active ingredient per gallon for liquids and % active ingredient for solid formulations. Abbreviations for formulations: EC = emulsifiable concentrate; DF = dry flowable; G = granule; ME = micro-encapsulated; WP = wettable powder; SL = soluble liquid; F or SC = flowable.

Appendix Table 2. Trade names and common names.

Trade name (formulation)	Common name
Aim (40 DF)	carfentrazone
Assure II (0.88 EC)	quizalofop p-ethyl
Bladex (4 F)	cyanazine
Buctril (4 EC)	bromoxynil
Bueno 6 (6 SL) (contains surfactant)	MSMA
Caparol (4 F)	prometryn
Cotoran (4 F)	fluometuron
Cotton Pro (4 F)	prometryn
Direx (80 DF)	diuron
Dual Magnum (7.62 EC)	metolachlor
FirstRate (84 DF)	cloransulam
Frontrow (co-pack of 84 DF + 80 DF)	cloransulam + flumetsulam
Fusilade DX (2 EC)	fluazifop-P
Goal 2XL (2 EC)	oxyfluorfen
Harvade (5 F)	dimethipin
Liberty (1.67 SC)	glufosinate
Meturon (4 F)	fluometuron
Pendimax (3.3 EC)	pendimethalin
Poast Plus (1 EC)	sethoxydim
Prowl (3.3 EC)	pendimethalin
Reflex (2 EC)	fomesafen
Roundup Ultra (4 SL)	glyphosate
Select (2 EC)	clethodim
Staple (85 SP)	pyrithiobac
Staple Plus	DPX-AEA46 (pyrithiobac + glyphosate)
Touchdown (3 SL ae)	glyphosate
Treflan (4 EC)	trifluralin
Valor (50 DF)	flumioxazin (formerly V-53482)

Appendix Table 3. Common, Bayer codes, and scientific names of plant species.

Common name	Bayer code ^z	Scientific name
annual grasses	GGGAN	
barnyardgrass	ECHCG	<i>Echinochloa crus-galli</i> (L.) Beauv.
broadleaf signalgrass	BRAPP	<i>Brachiaria platyphylla</i> (Griseb.) Nash
carpetweed	MOLVE	<i>Mollugo verticillata</i> L.
entireleaf morningglory	IPOHG	<i>Ipomoea hederacea</i> var. <i>integriuscula</i> Gray
fall panicum	PANDI	<i>Panicum dichotomiflorum</i> Michx.
goosegrass	ELEIN	<i>Eleusine indica</i> (L.) Gaertn.
hemp sesbania	SEBEX	<i>Sesbania exaltata</i> (Raf.) Rydb. ex A. W. Hill
johnsongrass	SORHA	<i>Sorghum halepense</i> L. (Pers.)
large crabgrass	DIGSA	<i>Digitaria sanguinalis</i> (L.) Scop.
morningglory species	IPOSS	
Palmer amaranth	AMAPA	<i>Amaranthus palmeri</i> S. Wats
pigweed species	AMASS	
pitted morningglory	IPOLA	<i>Ipomoea lacunosa</i> L.
prickly sida	SIDSP	<i>Sida spinosa</i> L.
redroot pigweed	AMARE	<i>Amaranthus retroflexus</i> L.
sicklepod	CASOB	<i>Senna obtusifolia</i> L.
smooth pigweed	AMACH	<i>Amaranthus hybridus</i> L.
spotted spurge	EPHMA	<i>Euphorbia maculata</i> L.
velvetleaf	ABUTH	<i>Abutilon theophrasti</i> Medicus

^z WSSA-approved computer code from Composite List of Weeds, Revised 1989. WSSA, 810 East 10th Street, Lawrence, KS 66044.

Appendix Table 4. Climatological data, Main Experiment Station, Fayetteville, 2000.

Day	April			May			June			July		
	Temp.		Rain- fall	Temp.		Rain- fall	Temp.		Rain- fall	Temp.		Rain- fall
	Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.	
(°F)	(°F)	(in.)	(°F)	(°F)	(in.)	(°F)	(°F)	(in.)	(°F)	(°F)	(in.)	
1	66	43		75	55		87	70		89	68	
2	61	49	0.10	72	51		87	67		88	69	
3	58	46	0.01	68	59	0.03	83	70		89	70	
4	53	32		72	51	0.22	77	70		87	72	
5	58	35		72	54	0.03	79	55	0.50	87	70	
6	81	52		64	56	0.41	67	48		89	69	
7	78	55		70	56	1.04	75	50		90	69	
8	73	30	0.01	81	68		79	52		91	73	
9	56	31		86	61		81	62		90	72	
10	65	34		65	47		82	67	0.98	90	74	
11	66	55	0.65	75	53		77	68	0.50	91	73	
12	59	43	0.13	82	72		78	69	0.72	92	78	
13	58	44	0.01	82	58	0.01	84	69		91	73	
14	71	45		65	33		83	72		91	66	
15	70	48		73	49		74	57	1.38	93	68	
16	73	52	0.18	70	52	0.01	82	63		94	67	
17	63	37		78	60	0.23	79	58	1.40	97	74	
18	67	39		82	71		73	60	2.01	84	74	
19	80	52		79	54	0.32	76	65	0.07	94	72	
20	80	48	0.08	70	55		81	69	1.67	96	74	
21	62	42		74	52		85	64	0.69	82	66	1.10
22	66	39		79	58	0.02	68	60		82	67	0.04
23	77	45		83	69	0.01	83	62		75	62	0.30
24	76	50	0.05	91	74		87	70		79	57	
25	66	43		89	63	0.89	84	70	1.59	81	58	
26	71	45		81	64		86	68	0.20	81	61	
27	71	46		85	64	1.75	78	66	0.08	86	65	0.24
28	72	45		74	56	0.14	81	67	0.17	84	65	
29	70	43		81	56		69	60	2.34	88	65	0.15
30	77	45		87	65		79	60		82	65	0.75
31				87	71					81	63	

Appendix Table 5. Climatological data, Cotton Branch Experiment Station, Marianna, 2000.

Day	April			May			June			July		
	Temp.		Rain- fall	Temp.		Rain- fall	Temp.		Rain- fall	Temp.		Rain- fall
	Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.	
(°F)	(°F)	(in.)	(°F)	(°F)	(in.)	(°F)	(°F)	(in.)	(°F)	(°F)	(in.)	
1	68	50		80	64		91	71		84	65	
2	74	57	1.1	81	58	0.07	90	67		87	69	
3	68	59	0.70	80	62	0.05	93	72		91	73	
4	61	41	0.52	70	60	0.61	78	70	0.04	90	73	
5	59	42		78	62	0.42	72	66	0.37	91	75	
6	71	45		78	63	1.04	76	54		94	71	
7	75	54		78	66		77	52		94	74	
8	71	40	0.44	82	69		81	57		94	71	
9	56	35		82	68		88	63		93	67	
10	64	41		81	54	0.19	92	71		95	76	
11	68	52	0.001	76	56		91	71		95	75	
12	62	47	0.62	86	71		92	68		96	75	
13	52	46	0.13	87	64	1.27	92	68		94	76	
14	57	46	0.17	77	53		93	73		96	74	
15	65	54		71	53		91	69	1.56	95	72	
16	67	56		73	58		86	73		97	74	
17	75	48	0.03	76	64		88	73		97	77	
18	66	47		87	68		80	70	0.29	97	78	
19	76	53		86	66	0.33	82	72	0.32	97	77	
20	85	64		78	64	0.03	88	73		100	76	
21	79	49		67	60	0.02	88	73		91	65	
22	70	46		78	60		78	67	0.97	82	66	0.001
23	74	56		87	66		87	69		84	67	
24	74	56	0.06	89	72		91	74		85	63	
25	60	48		87	68		91	75		85	60	
26	74	51	0.06	85	67	0.07	93	75		89	62	
27	74	49		89	71		90	72		92	64	
28	77	53		88	67	0.81	85	67		94	69	
29	75	49		85	62		81	66	1.09	96	72	
30	80	56		85	65		82	67		89	71	0.27
31				88	69					89	71	

Appendix Table 6. Climatological data, Southeast Branch Experiment Station, Rohwer, 2000.

Day	April			May			June			July		
	Temp.		Rain- fall	Temp.		Rain- fall	Temp.		Rain- fall	Temp.		Rain- fall
	Max. (°F)	Min. (°F)		Max. (°F)	Min. (°F)		Max. (°F)	Min. (°F)		Max. (°F)	Min. (°F)	
1	70	52		80	60	0.06	89	73		83	68	
2	74	58	3.90	81	64		91	68		87	71	
3	71	61	1.05	77	62	0.72	92	71		91	72	
4	61	42	0.39	71	60	0.57	86	71	0.15	90	73	
5	60	43		75	62	0.42	75	67	1.48	91	72	
6	70	45		80	64	1.20	77	55		92	71	
7	75	53		80	68		76	55		93	73	
8	77	43	0.19	84	69		81	58		95	74	
9	57	38		83	69		86	62		93	68	
10	64	46		84	57	0.46	90	70		96	75	
11	66	51		77	60		91	71		94	76	
12	65	51	0.10	87	71		91	69		95	73	
13	52	47	0.72	87	65	0.57	92	70		95	75	
14	55	47	0.02	79	54		92	73	0.10	94	73	
15	68	55		73	53		90	73	0.07	94	72	
16	73	58		76	57		89	73		98	78	
17	78	51		74	62		92	73		98	77	
18	64	53		87	69		85	71	0.88	97	77	
19	79	51		87	66	0.55	84	72	0.33	97	78	
20	85	64		78	66	0.40	89	62		99	76	
21	84	51		77	63		90	74		96	68	
22	72	47		77	63		87	71	0.04	86	67	
23	77	56	0.08	87	66		87	71		85	69	
24	71	58	0.12	90	71		94	74		84	63	
25	66	47		90	71		93	74		85	60	
26	73	47		89	75		93	74		88	62	
27	74	49		93	76		92	75		92	64	
28	78	52		91	67	0.65	88	72		94	68	
29	74	48		85	63		86	69	1.75	95	70	
30	81	51		88	67		81	68		95	70	0.55
31				90	66					87	68	