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## Herbicide Evaluation in Arkansas Cotton, 1999

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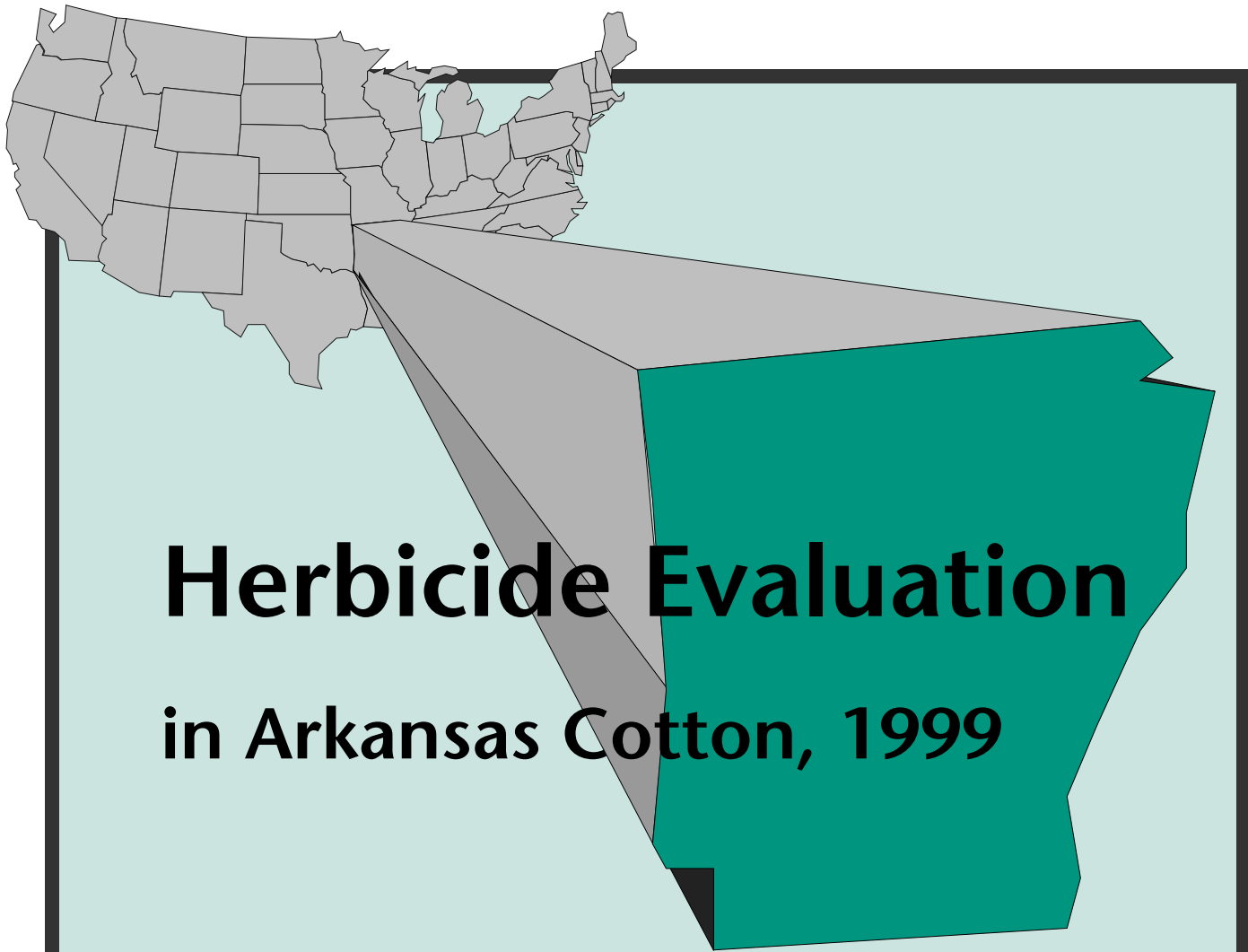
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**Marilyn McClelland  
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**ARKANSAS AGRICULTURAL EXPERIMENT STATION**

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# HERBICIDE EVALUATION IN ARKANSAS COTTON, 1999

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# **HERBICIDE EVALUATION IN ARKANSAS COTTON, 1999**

*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, at the Cotton Branch Ex-

periment Station, Marianna, and at Isgrig farm at Lonoke. 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 Table 1. The scientific names of the plants evaluated and their associated Bayer codes are listed in Appendix Table 2. Climatological data for 1999 are presented in Appendix Tables 3, 4, and 5.

## **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./ft<sup>2</sup> or no./m<sup>2</sup>, 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 prepackaged mixtures are listed in tables by their component herbicides in parentheses. All herbicide rates are expressed in pounds of active ingredient (lb/A) on a broadcast basis. 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 the LSD (least significant difference) test at the 5% level of significance was used for separation of means.

### ABBREVIATIONS OF TERMS

The following abbreviations are used in tables:

A/N, as needed

BkPkCO<sub>2</sub>, CO<sub>2</sub> 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

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

lt., light (weed population)

mod., moderate (weed population)

N/A, not applicable or not available

NAWF, nodes above white flower

Noz, nozzles

NS, not significant

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)

UNR, ultra-narrow row

XR, extended range nozzle



**Table 1. Preplant burndown herbicides, Fayetteville, 1999.**

TEST INFORMATION	
Location .....	Fayetteville
Experimental Design / replications .....	RCB / 3
Plot size .....	2 m x 5 m
Row width / Number of rows per plot .....	N/A
Crop / Cultivar .....	N/A
Seeding rate .....	N/A
Planting date / Harvest date .....	N/A
Soil type .....	Taloka silt loam (27% sand, 64% silt, 9% clay)
% OM / pH .....	1.5 / 5.7
Comments: PPL = preplant.	
Application type	PPL
Date applied	April 9, 1999
Time	4:00 pm
Incorporation equipment	N/A
Air/Soil temperature (F)	74 / 70
Relative humidity (%)	70
Wind (mph)	3
Cloud cover (%)	0
Soil moisture	moist
Crop stage/Height	N/A
Sprayer type/mph	BkPkCO <sub>2</sub> / 3
Nozzle type/Size	Flat Fan / XR8002VS
Boom ht / # Noz / Spacing (in.)	22 / 4 / 17
Gpa / Psi	15 / 25
<b>Weed species</b> (density)	----- [height (in.)] -----
ANTCO (6/m)	5-7"
STEME (60% cover)	7-9"
GERCA (4-12/m)	4-7"
OEOLA (12/m)	6" rosette
RANXX (5-15/m)	5-9"
LEPVI (1-2/m)	6"
POANN (3/m)	3"
VICVI (N/A)	N/A

Conclusions: All treatments gave good to excellent control of mayweed and chickweed. There was a trend for control of Carolina geranium to be higher with paraquat treatments than glyphosate or sulfosate, except if 2,4-D or cyanazine was added to the latter to increase control. Dicamba and 2,4-D increased the activity of both glyphosate and paraquat on cutleaf eveningprimrose. Fomesafen + sulfosate and glyphosate + flumioxazin also controlled primrose >95% at the final rating. Dicamba + cyanazine gave good to excellent control of most species but was the weakest treatment on buttercup (82%). All other treatments controlled buttercup 98 to 100%. Gramoxone alone failed to control Virginia pepperweed (63% 4 WAT, compared to 98 to 100% with other treatments). All burndown treatments were quite active this year and gave good, total control. However, as usually recommended, a second burndown application of paraquat, glyphosate, or sulfosate needed to be applied at cotton planting to control remaining vegetation.

Table 1. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control												
			Mayweed (ANTCO)			Common chickweed (STEME)			Carolina geranium (GERCA)			Cutleaf evening- primrose (OEOLA)			
			4/19	5/5	5/26	4/19	5/5	5/26	4/19	5/5	5/26	4/19	5/5	5/26	
----- (%) -----															
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0	0
Glyphosate (Roundup Ultra)	1.0	PPL	50	94	90	53	100	88	53	93	83	47	88	78	
Paraquat (Gramoxone Extra) + AG-98	0.63 0.25% <sup>z</sup>	PPL	99	88	95	100	100	100	99	87	100	85	63	73	
Sulfosate (Touchdown 5) + AG-98	1.0 0.25%	PPL	43	98	98	47	100	90	47	88	83	47	90	87	
Dicamba (Clarity) + glyphosate	0.25 0.75	PPL	52	93	93	53	100	96	53	92	90	48	93	92	
Dicamba + paraquat + AG-98	0.25 0.63 0.25%	PPL	100	99	100	100	100	100	100	100	99	93	95	97	
Dicamba + sulfosate + AG-98	0.25 0.75 0.25%	PPL	52	97	93	52	100	98	52	94	87	52	93	87	
Dicamba + cyanazine (Bladex) + AG-98	0.25 1.0 0.25%	PPL	52	99	93	65	100	100	63	98	100	48	92	87	
Glyphosate + cyanazine	0.75 1.0	PPL	60	94	92	73	100	100	67	94	91	55	95	85	
Paraquat + cyanazine + AG-98	0.63 1.0 0.25%	PPL	99	100	100	100	100	100	100	100	100	88	86	90	
Glyphosate + 2,4-D amine	0.75 0.5	PPL	58	96	93	58	100	93	65	100	93	58	95	92	
Paraquat + 2,4-D + AG-98	0.63 0.5 0.25%	PPL	99	94	100	100	100	100	100	100	100	93	98	97	
Sulfosate + 2,4-D + AG-98	0.75 0.5 0.25%	PPL	55	94	92	58	100	86	57	100	90	57	99	95	
Glyphosate + oxyfluorfen (Goal XL)	0.75 0.2	PPL	55	96	95	57	100	90	65	87	94	55	92	83	
Sulfosate + fomesafen (Reflex) + AG-98	0.75 0.375 0.25%	PPL	68	99	98	68	100	95	72	87	92	60	93	97	
Glyphosate + flumioxazin (Valor)	0.75 0.063	PPL	62	98	98	58	100	96	63	93	97	60	97	96	
LSD (0.05)			11	8	7	14	1	7	10	5	7	8	6	7	

continued

**Table 1. Section 2.**

Herbicide	Rate (lb/A)	Application timing	Weed control										
			Buttercup (RANXX)			Virginia pepperweed (LEPVI)			Annual bluegrass (POANN)			Hairy vetch (VICVI)	
			4/19	5/5	5/26	4/19	5/5	5/26	4/19	5/5	5/26	4/19	5/5
Untreated check			0	0	0	0	0	0	0	0	0	0	0
Glyphosate (Roundup Ultra)	1.0	PPL	53	100	99	53	100	98	50	100	98	100	97
Paraquat (Gramoxone Extra) + AG-98	0.63 0.25% <sup>z</sup>	PPL	99	100	98	99	63	92	100	97	97	85	98
Sulfosate (Touchdown 5) + AG-98	1.0 0.25%	PPL	53	100	98	47	100	98	38	100	98	95	98
Dicamba (Clarity) + glyphosate	0.25 0.75	PPL	53	100	100	53	98	99	47	100	95	100	100
Dicamba + paraquat + AG-98	0.25 0.63 0.25%	PPL	98	100	100	99	100	100	100	100	100	100	100
Dicamba + sulfosate + AG-98	0.25 0.75 0.25%	PPL	53	97	98	53	100	99	45	93	77	100	100
Dicamba + cyanazine (Bladex) + AG-98	0.25 1.0 0.25%	PPL	52	87	82	52	100	99	37	98	77	100	100
Glyphosate + cyanazine	0.75 1.0	PPL	52	99	99	57	100	99	47	100	90	97	98
Paraquat + cyanazine + AG-98	0.63 1.0 0.25%	PPL	100	100	100	100	100	100	100	100	100	100	100
Glyphosate + 2,4-D amine	0.75 0.5	PPL	65	100	100	62	99	100	47	93	83	100	100
Paraquat + 2,4-D + AG-98	0.63 0.5 0.25%	PPL	98	100	100	98	98	98	95	85	92	100	100
Sulfosate + 2,4-D + AG-98	0.75 0.5 0.25%	PPL	58	100	99	57	100	99	53	98	87	100	100
Glyphosate + oxyfluorfen (Goal XL)	0.75 0.2	PPL	60	100	98	53	100	97	48	99	93	98	98
Sulfosate + fomesafen (Reflex) + AG-98	0.75 0.375 0.25%	PPL	65	100	100	67	100	100	55	100	90	99	100
Glyphosate + flumioxazin (Valor)	0.75 0.063	PPL	67	100	100	62	100	99	48	100	95	97	100
LSD (0.05)			10	3	3	11	2	5	11	7	11	5	3

<sup>z</sup> Rate in vol/vol.

Table 2. Preplant burndown herbicides 1, Rohwer, 1999.

TEST INFORMATION			
Location .....	Rohwer	Crop / Cultivar .....	N/A
Experimental Design / replications .....	RCB / 4	Seeding rate .....	N/A
Plot size .....	12.66 ft x 35 ft	Planting date / Harvest date .....	N/A
Row width / Number of rows per plot .....	N/A	Soil type .....	silt loam (16% sand, 67% silt, 17% clay)
		% OM .....	2.2
Comments: PPL = preplant.			
Application type		PPL	
Date applied		March 1, 1999	
Time		10:00 am	
Incorporation equipment		N/A	
Air/Soil temperature (F)		60 / 63	
Wind (mph)		2	
Cloud cover (%)		30	
Soil moisture		optimal	
Sprayer type/mph		BkPkCO <sub>2</sub> / 3	
Nozzle type/Size		Flat Fan / 8002	
Boom ht / # Noz / Spacing (in.)		24 / 8 / 19	
Gpa / Psi		15 / 22	
<b>Weed species</b>		----- [height (in.)] -----	
LAMAM		4-6"	
POAAN		2"	
COPDI		2" rosette	
OEOLA		3" rosette	

Conclusions: Henbit burndown was most rapid with treatments containing paraquat. Paraquat + oxyfluorfen (0.75 + 0.25 lb/A) showed 65% burndown 4 DAT. Paraquat + dicamba (0.75 + 0.25 lb/A) was the only other treatment with greater than 50% burndown 4 DAT. However, by 14 DAT, all treatments that contained paraquat exhibited greater than 80% burndown of henbit. The 21 DAT evaluation showed glyphosate + oxyfluorfen, paraquat + prometryn, paraquat + cyanazine, and paraquat + oxyfluorfen to have greater than 95% burndown of henbit. Initial burndown of annual bluegrass was also greater with treatments containing paraquat. However, by 21 DAT, most of the treatments containing glyphosate also exhibited greater than 90% control, the exceptions being glyphosate + prometryn and glyphosate + cyanazine. It appeared that prometryn and cyanazine may have slowed the visible action of glyphosate. At 40 DAT, all treatments containing glyphosate, sulfosate, or paraquat resulted in greater than 95% burndown of annual bluegrass. At 14 DAT, paraquat + prometryn was the only treatment that offered greater than 90% burndown of swinecress; however, there were no statistical differences among any of the paraquat treatments. By 21 DAT, swinecress was effectively controlled with glyphosate + dicamba, glyphosate + 2,4-D, glyphosate + diuron, paraquat + prometryn, and dicamba + cyanazine. At 40 DAT, all treatments except dicamba + cyanazine, dicamba + Harvade, paraquat + Harvade, paraquat + cyanazine, and paraquat + oxyfluorfen offered near perfect control of swinecress. Glyphosate + diuron and paraquat + prometryn were the only treatments that offered greater than 85% control of cutleaf eveningprimrose. There were no differences in the speed of burndown or total control offered by similar rates of sulfosate and glyphosate.

Table 2. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Henbit (LAMAM)			Swinecress (COPDI)			
			3/5	3/15	3/22	3/5	3/15	3/22	4/10
			----- (%) -----						
Untreated check			0	0	0	0	0	0	75
Glyphosate (Roundup Ultra) + cyanazine (Bladex)	0.75 0.5	PPL	0	15	46	0	50	82	75
Glyphosate + oxyfluorfen (Goal XL)	0.75 0.25	PPL	10	73	97	3	54	84	100
Glyphosate + dicamba (Clarity)	0.75 0.25	PPL	5	36	61	3	58	90	100
Glyphosate + 2,4-D amine	0.75 0.5	PPL	16	46	84	10	59	92	90
Glyphosate + prometryn (Caparol FL)	0.75 1.0	PPL	0	0	35	4	48	87	96
Glyphosate + dimethipin (Harvade)	0.75 0.31	PPL	3	46	78	3	56	87	69
Glyphosate + diuron (Direx)	0.75 1.0	PPL	5	10	65	3	70	98	98
Paraquat + dimethipin	0.75 0.31	PPL	34	91	68	45	78	66	81
Paraquat + prometryn	0.75 1.0	PPL	43	93	95	34	95	100	96
Paraquat + cyanazine	0.75 0.5	PPL	36	88	98	38	83	81	88
Paraquat + oxyfluorfen	0.75 0.25	PPL	65	97	99	61	83	73	83
Dicamba + cyanazine	0.25 0.5	PPL	3	4	60	0	33	54	88
Dicamba + oxyfluorfen	0.25 0.25	PPL	10	39	55	8	40	54	91
Dicamba + prometryn	0.25 1.0	PPL	3	13	65	9	35	76	98
Dicamba + sulfosate (Touchdown 5)	0.25 0.75	PPL	10	34	45	5	51	84	89
Dicamba + dimethipin	0.25 0.31	PPL	5	28	50	5	21	26	100
Dicamba + diuron	0.25 1.0	PPL	5	13	65	3	46	90	100
Dicamba + paraquat	0.25 0.75	PPL	53	80	88	50	86	87	90
Glyphosate	0.75	PPL	0	41	83	0	43	83	100
Sulfosate	0.75	PPL	3	49	89	0	35	8	100
LSD (0.05)			14	20	30	7	20	18	NS

continued

Table 2. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Cutleaf eveningprimrose (OEOLA)				Annual bluegrass (POANN)			
			3/5	3/15	3/22	4/10	3/5	3/15	3/22	4/10
Untreated check			0	0	46	69	21	0	74	75
Glyphosate (Roundup Ultra) + cyanazine (Bladex)	0.75 0.5	PPL	3	15	33	73	10	26	40	50
Glyphosate + oxyfluorfen (Goal XL)	0.75 0.25	PPL	21	28	48	96	3	79	78	96
Glyphosate + dicamba (Clarity)	0.75 0.25	PPL	8	15	67	98	25	63	35	50
Glyphosate + 2,4-D amine	0.75 0.5	PPL	18	19	66	86	39	65	76	75
Glyphosate + prometryn (Caparol FL)	0.75 1.0	PPL	0	13	59	92	35	18	75	75
Glyphosate + dimethipin (Harvade)	0.75 0.31	PPL	3	19	48	69	20	65	46	50
Glyphosate + diuron (Direx)	0.75 1.0	PPL	4	15	45	92	20	15	25	59
Paraquat + dimethipin	0.75 0.31	PPL	48	36	36	92	6	90	63	81
Paraquat + prometryn	0.75 1.0	PPL	26	48	51	90	24	96	68	75
Paraquat + cyanazine	0.75 0.5	PPL	39	38	23	81	11	85	41	63
Paraquat + oxyfluorfen	0.75 0.25	PPL	54	53	40	80	44	97	89	100
Dicamba + cyanazine	0.25 0.5	PPL	10	15	46	91	11	6	59	75
Dicamba + oxyfluorfen	0.25 0.25	PPL	23	24	58	90	19	30	37	68
Dicamba + prometryn	0.25 1.0	PPL	10	16	30	44	20	11	25	23
Dicamba + sulfosate (Touchdown 5)	0.25 0.75	PPL	9	14	73	84	71	56	98	99
Dicamba + dimethipin	0.25 0.31	PPL	15	13	59	97	15	11	98	100
Dicamba + diuron	0.25 1.0	PPL	11	19	70	90	24	10	62	75
Dicamba + paraquat	0.25 0.75	PPL	46	40	51	82	18	70	40	75
Glyphosate	0.75	PPL	0	10	55	96	6	63	84	98
Sulfosate	0.75	PPL	0	11	65	99	19	63	71	75
LSD (0.05)			9	12	NS	NS	NS	15	NS	NS

Table 3. Preplant burndown herbicides 2, Rohwer, 1999.

TEST INFORMATION			
Location .....	Rohwer	Crop / Cultivar .....	N/A
Experimental Design / replications .....	RCB / 3	Seeding rate .....	N/A
Plot size .....	6.33 ft x 35 ft	Planting date / Harvest date .....	N/A
Row width / Number of rows per plot .....	N/A	Soil type .....	silt loam (16% sand, 67% silt, 17% clay)
		% OM .....	2.2
Comments: PPL = preplant.			
Application type		PPL	
Date applied		March 1, 1999	
Time		10:00 am	
Incorporation equipment		N/A	
Air/Soil temperature (F)		60 / 63	
Wind (mph)		2	
Cloud cover (%)		0	
Soil moisture		adequate	
Sprayer type/mph		BkPkCO <sub>2</sub> / 3	
Nozzle type/Size		Flat Fan / 8002	
Boom ht / # Noz / Spacing (in.)		22 / 4 / 19	
Gpa / Psi		15 / 22	
<b>Weed species</b> (density)		----- (no. of leaves) -----	
RUMCR (mod.)		6-12 lf (bolting)	
STEME (mod.)		2-3 lf (prebloom)	
GERCA (mod.)		2-4 lf (prebloom)	
CRLTI (mod.)		rosette (prebloom)	
POANN (mod.)		2 lf (prebloom)	

Conclusions: At 4 and 14 DAT, the treatments containing paraquat showed more burn on most weeds than those without paraquat. However, by 21 and 40 DAT, the paraquat treatments showed less control than some of the other treatments. At 21 DAT, dicamba + paraquat provided the greatest burndown control across all weed species, ranging from 85% burndown of dock to 98% burndown of chickweed. Glyphosate + dicamba, glyphosate + 2,4-D, and dicamba + sulfosate began to provide acceptable control across species at 21 DAT. By 40 DAT, the curly dock had grown out of the dicamba + paraquat treatment effects, and control had dropped from 85% at 21 DAT to 40%. Control of other species remained high with this treatment. However, by 40 DAT, glyphosate + dicamba, glyphosate + 2,4-D, dicamba + sulfosate, and glyphosate + oxyfluorfen were the superior treatments across the entire weed spectrum. Glyphosate and sulfosate alone failed to offer grower-acceptable burndown of the weed spectrum. Glyphosate + sulfosate showed similar efficacy and speed of burndown.

Table 3. Section 1.

Herbicide	Application Rate (lb/A)	Application timing	Weed control								
			Curly dock (RUMCR)				Chickweed (STEME)				
			3/5	3/15	3/22	4/10	3/5	3/15	3/22	4/10	
Untreated check			0	0	0	0	0	0	0	0	0
Glyphosate (Roundup Ultra) + cyanazine (Bladex)	0.75 0.5	PPL	3	17	65	98	1	20	98	100	
Glyphosate + oxyfluorfen (Goal XL)	0.75 0.25	PPL	30	50	85	96	0	23	97	100	
Glyphosate + dicamba (Clarity)	0.75 0.25	PPL	28	55	87	96	0	23	85	100	
Glyphosate + 2,4-D amine (2,4-D)	0.75 0.5	PPL	27	63	88	97	3	30	86	100	
Glyphosate + prometryn (Caparol FL)	0.75 1.0	PPL	12	18	65	95	0	27	96	100	
Glyphosate + dimethipin (Harvade)	0.75 0.31	PPL	0	27	48	85	0	13	94	100	
Glyphosate + diuron (Direx)	0.75 1.0	PPL	0	10	42	90	0	33	98	100	
Paraquat (Gramoxone Extra) + dimethipin	0.75 0.31	PPL	53	72	50	13	72	83	98	100	
Paraquat + prometryn	0.75 1.0	PPL	62	72	53	7	75	82	98	100	
Paraquat + cyanazine	0.75 0.5	PPL	58	78	62	10	67	93	98	100	
Paraquat + oxyfluorfen	0.75 0.25	PPL	55	72	53	12	68	88	97	93	
Dicamba + cyanazine	0.25 0.5	PPL	37	55	90	62	3	38	87	93	
Dicamba + oxyfluorfen	0.25 0.25	PPL	55	82	95	93	0	17	37	83	
Dicamba + prometryn	0.25 1.0	PPL	38	58	90	87	0	17	55	98	
Dicamba + sulfosate (Touchdown 5)	0.25 0.75	PPL	23	50	87	100	0	30	93	100	
Dicamba + dimethipin	0.25 0.31	PPL	25	67	90	90	0	8	25	47	
Dicamba + diuron	0.25 1.0	PPL	27	50	93	88	0	33	92	100	
Dicamba + paraquat	0.25 0.75	PPL	57	50	85	40	70	75	98	100	
Glyphosate	0.75	PPL	25	25	53	74	28	37	95	100	
Sulfosate	0.75	PPL	0	10	38	85	0	3	93	100	
LSD (0.05)			22	19	15	23	19	28	16	21	

continued



**Table 3. Section 2.**

Herbicide	Application		Weed control							
			Carolina geranium (GERCA)				Plains coreopsis (CRLTI)			
	Rate (lb/A)	timing	3/5	3/15	3/22	4/10	3/5	3/15	3/22	4/10
Untreated check			0	17	37	65	0	48	48	63
Glyphosate (Roundup Ultra) + cyanazine (Bladex)	0.75 0.5	PPL	1	45	63	100	1	72	76	85
Glyphosate + oxyfluorfen (Goal XL)	0.75 0.25	PPL	0	25	37	67	12	47	49	33
Glyphosate + dicamba (Clarity)	0.75 0.25	PPL	7	7	30	99	15	28	45	80
Glyphosate + 2,4-D amine (2,4-D)	0.75 0.5	PPL	7	32	53	100	15	35	49	73
Glyphosate + prometryn (Caparol FL)	0.75 1.0	PPL	0	20	47	100	3	43	91	83
Glyphosate + dimethipin (Harvade)	0.75 0.31	PPL	0	33	43	100	0	65	73	57
Glyphosate + diuron (Direx)	0.75 1.0	PPL	0	70	75	67	0	88	87	45
Paraquat (Gramoxone Extra) + dimethipin	0.75 0.31	PPL	63	49	70	70	42	70	74	95
Paraquat + prometryn	0.75 1.0	PPL	57	52	67	100	58	88	98	45
Paraquat + cyanazine	0.75 0.5	PPL	37	40	63	67	47	25	63	58
Paraquat + oxyfluorfen	0.75 0.25	PPL	58	20	30	50	60	47	37	50
Dicamba + cyanazine	0.25 0.5	PPL	20	52	53	83	27	67	59	67
Dicamba + oxyfluorfen	0.25 0.25	PPL	13	33	72	73	28	63	80	73
Dicamba + prometryn	0.25 1.0	PPL	7	20	38	67	28	43	66	72
Dicamba + sulfosate (Touchdown 5)	0.25 0.75	PPL	2	63	63	73	8	67	76	94
Dicamba + dimethipin	0.25 0.31	PPL	10	32	58	100	12	53	89	80
Dicamba + diuron	0.25 1.0	PPL	12	38	62	67	12	50	74	83
Dicamba + paraquat	0.25 0.75	PPL	62	45	65	67	50	62	63	67
Glyphosate	0.75	PPL	22	13	37	73	23	53	64	53
Sulfosate	0.75	PPL	0	37	58	43	0	63	78	62
LSD (0.05)	18	NS	NS	NS	23	NS	NS	NS		

continued

**Table 3. Section 3.**

Herbicide	Rate (lb/A)	Application timing	Weed control			
			Annual bluegrass (POANN)			
			3/5	3/15	3/22	4/10
Untreated check			0	0	0	0
Glyphosate (Roundup Ultra) + cyanazine (Bladex)	0.75 0.5	PPL	0	15	67	100
Glyphosate + oxyfluorfen (Goal XL)	0.75 0.25	PPL	0	37	82	97
Glyphosate + dicamba (Clarity)	0.75 0.25	PPL	0	48	90	98
Glyphosate + 2,4-D amine	0.75 0.5	PPL	0	40	87	98
Glyphosate + prometryn (Caparol FL)	0.75 1.0	PPL	0	20	78	99
Glyphosate + dimethipin (Harvade)	0.75 0.31	PPL	0	38	90	99
Glyphosate + diuron (Direx)	0.75 1.0	PPL	0	13	80	98
Paraquat (Gramoxone Extra) + dimethipin	0.75 0.31	PPL	67	92	93	99
Paraquat + prometryn	0.75 1.0	PPL	75	93	97	98
Paraquat + cyanazine	0.75 0.5	PPL	67	90	98	100
Paraquat + oxyfluorfen	0.75 0.25	PPL	70	93	99	100
Dicamba + cyanazine	0.25 0.5	PPL	0	20	20	30
Dicamba + oxyfluorfen	0.25 0.25	PPL	0	18	17	15
Dicamba + prometryn	0.25 1.0	PPL	0	3	3	7
Dicamba + sulfosate (Touchdown 5)	0.25 0.75	PPL	0	25	82	90
Dicamba + dimethipin	0.25 0.31	PPL	0	12	7	10
Dicamba + diuron	0.25 1.0	PPL	0	3	0	53
Dicamba + paraquat	0.25 0.75	PPL	48	67	92	92
Glyphosate	0.75	PPL	20	35	93	98
Sulfosate	0.75	PPL	0	32	83	98
LSD (0.05)			15	21	18	26

**Table 4. Benefits of pyriithiobac (Staple) in Roundup Ready® cotton, Fayetteville, 1999.**

**TEST INFORMATION**

Location .....	Fayetteville	Crop / Cultivar .....	cotton / Paymaster 1220BR
Experimental Design / replications .....	RCB / 4	Seeding rate .....	4 / ft
Plot size .....	3.3 ft x 27 ft	Planting date / Harvest date .....	June 3, 1999 / N/A
Row width / Number of rows per plot .....	40" / 1	Soil type .....	Taloka silt loam (28% sand, 64% silt, 8% clay)
		% OM .....	1.2

Comments: EOT = early over-the-top and LOT = late over-the-top.

Application type	EOT	LOT
Date applied	June 15, 1999	June 24, 1999
Time	6:00 am	8:00 am
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	62 / 60	79 / 78
Relative humidity (%)	70	85
Wind (mph)	0	2
Cloud cover (%)	30	80
Soil moisture	moist	very wet
Crop stage/Height (in.)	cotyledon / 2.5"	2-lf / 5"
Sprayer type/mph	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3
Nozzle type/Size	Flat fan / XR8002VS	Flat fan / XR800 <sub>2</sub> VS
Boom ht / # Noz / Spacing (in.)	21 / 2 / 18	25 / 2 / 18
Gpa / Psi	15 / 25	15 / 25
<b>Weed species (density)</b>	----- [no. of leaves / height (in.)] -----	
DIGSA (32/m <sup>2</sup> )	1-3 lf / 0.5-0.75"	6-12 lf / 2-5"
AMACH (20/m <sup>2</sup> )	2-5 lf / 0.5-1.5"	8 lf / 3-6"
IPOLA (32/m <sup>2</sup> )	cot - 2 lf / 1-1.5"	5-6 lf / 4-6"
IPOHG (12/m <sup>2</sup> )	cot - 1 lf / 0.75-1.75"	5-8 lf / 3-4"
SIDSP (36/m <sup>2</sup> )	cot - 1 lf / 0.5-0.75"	3-5 lf / 1-2"
ABUTH (30/m <sup>2</sup> )	2 lf / 1"	4-5 lf / 4-6"

Conclusions: Pyriithiobac (0.031 lb/A) and glyphosate applied twice gave better overall weed control than one LOT application or glyphosate EOT *fb* LOT because of weak morningglory control with other treatments. For smooth pigweed, velvetleaf, and prickly sida, control with the pyriithiobac/glyphosate combinations was better than with a 1X rate (0.063 lb/A) of pyriithiobac alone. Control of smooth pigweed and velvetleaf was lower with two applications of glyphosate alone than with the pyriithiobac/glyphosate combinations, although control of both species was considered good (89 and 95%, respectively). Earlier applications of pyriithiobac should be evaluated.

Table 4. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Large crabgrass (DIGSA)				Smooth pigweed (AMACH)				
			6/21	7/9	7/28	8/10	6/21	7/9	7/28	8/10	
Untreated check			0	0	0	0	0	0	0	0	0
Pyrithiobac (Staple) + quizalofop-P (Assure) +	0.063										
Activate Plus	0.25% <sup>z</sup>	LOT		98	96	93		74	91	85	
Pyrithiobac + glyphosate (Roundup Ultra) +	0.047 0.75										
Activate Plus	0.25%	LOT		99	100	100		100	100	100	
Pyrithiobac + glyphosate +	0.031 0.75										
Activate Plus	0.25%	LOT		100	99	97		100	100	99	
Pyrithiobac + glyphosate +	0.31 0.75										
Activate Plus <i>fb</i> pyrithiobac + glyphosate +	0.25% 0.31 0.75	EOT									
Activate Plus	0.25%	LOT	100	100	100	100		100	100	100	100
Pyrithiobac + glyphosate +	0.031 0.75										
Activate Plus <i>fb</i> glyphosate	0.25% 0.75	EOT									
glyphosate	0.75	LOT	100	100	99	98		100	100	100	100
Glyphosate <i>fb</i> glyphosate	0.75 0.75	EOT LOT									
glyphosate	0.75	LOT	100	98	94	96		100	99	89	89
LSD (0.05)			1	2	3	3		1	23	6	8

continued

**Table 4. Section 2.**

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Pitted morningglory (IPOLA)				Entireleaf morningglory (IPOHG)				
			6/21	7/9	7/28	8/10	6/21	7/9	7/28	8/10	
Untreated check			0	0	0	0	0	0	0	0	0
Pyrithiobac (Staple) + quizalofop-P (Assure) + Activate Plus	0.063 0.063 0.25% <sup>z</sup>	LOT		59	45	36		63	53	36	
Pyrithiobac + glyphosate (Roundup Ultra) + Activate Plus	0.047 0.75 0.25%	LOT		73	85	79		76	91	85	
Pyrithiobac + glyphosate + Activate Plus	0.031 0.75 0.25%	LOT		69	75	70		69	76	76	
Pyrithiobac + glyphosate + Activate Plus <i>fb</i>	0.31 0.75 0.25%	EOT									
pyrithiobac + glyphosate + Activate Plus	0.31 0.75 0.25%	LOT	84	97	96	93	84	97	98	98	
Pyrithiobac + glyphosate + Activate Plus <i>fb</i>	0.031 0.75 0.25%	EOT									
glyphosate Activate Plus <i>fb</i>	0.75 0.75	LOT	79	91	80	74	79	92	88	80	
Glyphosate <i>fb</i> glyphosate	0.75 0.75	LOT	71	80	69	61	73	80	71	64	
LSD (0.05)			9	6	7	10	9	7	11	13	

continued

Table 4. Section 3.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Velvetleaf (ABUTH)				Prickly sida (SIDSP)				
			6/21	7/9	7/28	8/10	6/21	7/9	7/28	8/10	
Untreated check			0	0	0	0	0	0	0	0	0
Pyrithiobac (Staple) + quizalofop-P (Assure) + Activate Plus	0.063 0.063 0.25% <sup>z</sup>	LOT		96	97	93		86	86	83	
Pyrithiobac + glyphosate (Roundup Ultra) + Activate Plus	0.047 0.75 0.25%	LOT		100	100	100		94	99	98	
Pyrithiobac + glyphosate + Activate Plus	0.031 0.75 0.25%	LOT		95	100	100		91	95	99	
Pyrithiobac + glyphosate + Activate Plus <i>fb</i> pyrithiobac + glyphosate + Activate Plus	0.31 0.75 0.25% 0.31 0.75 0.25%	EOT LOT	90	100	100	100	100	100	100	100	100
Pyrithiobac + glyphosate + Activate Plus <i>fb</i> glyphosate	0.031 0.75 0.25% 0.75	EOT LOT	90	100	100	100	100	100	99	96	
Glyphosate <i>fb</i> glyphosate	0.75 0.75	EOT LOT	90	99	95	95	100	97	95	93	
LSD (0.05)			1	3	4	3	1	7	7	6	

continued

**Table 4. Section 4.**

Herbicide	Rate (lb/A)	Application timing	Cotton injury			
			6/21	7/9	7/28	8/10
			----- (%) -----			
Untreated check			0	0	0	0
Pyriithiobac (Staple)+	0.063					
quizalofop-P (Assure) +	0.063					
Activate Plus	0.25% <sup>z</sup>	LOT		0	0	0
Pyriithiobac +	0.047					
glyphosate (Roundup Ultra)	0.75					
+ Activate Plus	0.25%	LOT		0	0	0
Pyriithiobac +	0.031					
glyphosate +	0.75					
Activate Plus	0.25%	LOT	0	0	0	0
Pyriithiobac +	0.31					
glyphosate +	0.75					
Activate Plus <i>fb</i>	0.25%	EOT				
pyriithiobac +	0.31					
glyphosate +	0.75					
Activate Plus	0.25%	LOT	0	4	4	0
Pyriithiobac +	0.031					
glyphosate +	0.75					
Activate Plus <i>fb</i>	0.25%	EOT				
glyphosate	0.75	LOT	0	4	0	0
Glyphosate <i>fb</i>	0.75	EOT				
glyphosate	0.75	LOT	0	0	0	0
LSD (0.05)			NS	3	NS	NS

<sup>z</sup> Rate in vol/vol.

**Table 5. Benefits of pyriithiobac (Staple) in Roundup Ready® cotton, Marianna, 1999.****TEST INFORMATION**

Location .....	Marianna	Crop / Cultivar .....	cotton / Paymaster 1220BR
Experimental Design / replications .....	RCB / 4	Seeding rate .....	4 / ft
Plot size .....	12.7 ft x 40 ft	Planting date / Harvest date .....	May 19, 1999 / N/A
Row width / Number of rows per plot .....	38" / 4	Soil type .....	silt loam (2% sand, 86% silt, 12% clay)
		% OM / pH .....	1.1 / 5.5

Comments: PRE = preemergence; 2-lf = over-the-top at 2-lf cotton; and 4-lf = over-the-top at 4-lf cotton.

Application type	PRE	2-LF	4-LF
Date applied	May 18, 1999	June 7, 1999	June 16, 1999
Time	3:00 pm	6:00 pm	5:00 pm
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	77 / 79	90	76
Relative humidity (%)	55	N/A	N/A
Wind (mph)	5	3	3
Cloud cover (%)	0	0	0
Soil moisture	N/A	adequate	adequate
Crop stage/Height	N/A	2-lf / 3"	4-lf / 5"
Sprayer type/mph	Tractor-CO <sub>2</sub> / 3	Tractor-CO <sub>2</sub> / 3	Tractor-CO <sub>2</sub> / 3
Nozzle type/Size	Flat fan / 8003	Flat fan / 8003	Flat fan / 8003
Boom ht / # Noz / Spacing (in.)	19 / 8 / 19	21 / 8 / 19	21 / 8 / 19
Gpa / Psi	20 / 28	20 / 28	20 / 28
Weed species (density)	-----	(no. of leaves) -----	-----
IPOLA (3/ft <sup>2</sup> )	N/A	2-4 lf	cot.-5 lf
SIDSP (3/ft <sup>2</sup> )	N/A	cot.-2 lf	cot.-3 lf
AMACH (3/ft <sup>2</sup> )	N/A	cot.	cot.-1 lf
MOLVE (4/ft <sup>2</sup> )	N/A	cot.-2 lf	cot.-3 lf

Conclusions: Glyphosate or pyriithiobac + glyphosate POST applied twice controlled pitted morningglory better than a single POST application, even following pyriithiobac PRE. However, PRE application of pyriithiobac + fluometuron allowed adequate control with only one POST application. Although a single application of pyriithiobac + glyphosate applied at the cotton four-leaf stage gave adequate control by 2 weeks after application, the early-season interference may be risky for optimum cotton production. In summary, although one application of pyriithiobac + glyphosate at the cotton four-leaf stage is adequate for mid-season control of some species (grass species, smooth pigweed, and carpetweed), two applications or one application preceded by pyriithiobac + fluometuron PRE is needed for morningglory control.



**Table 5. Section 1.**

Herbicide	Application Rate (lb/A)	Application timing	Weed control										
			Prickly sida (SIDSP)					Pitted morningglory (IPOLA)					
			6/13	6/16	6/21	6/28	7/6	6/13	6/16	6/21	6/28	7/6	
Untreated check			0	0	0	0	0	0	0	0	0	0	0
Pyrithiobac (Staple) + fluometuron (Cotoran) <i>fb</i>	0.031 0.94	PRE											
pyrithiobac + quizalofop (Assure) + AG-98	0.063 0.063 0.25% <sup>z</sup>	4-LF	100	100	100	99	100	88	88	83	89	92	
Pyrithiobac + fluometuron <i>fb</i>	0.031 0.94	PRE											
pyrithiobac + glyphosate (Roundup Ultra) + AG-98	0.031 0.75 0.25%	4-LF	100	100	100	99	100	78	78	86	90	96	
Pyrithiobac <i>fb</i> pyrithiobac + glyphosate + AG-98	0.031 0.031 0.75 0.25%	PRE 4-LF	96	96	99	100	100	73	73	69	78	89	
Pyrithiobac + glyphosate + AG-98 <i>fb</i>	0.031 0.75 0.25%	2-LF											
pyrithiobac + glyphosate + AG-98	0.031 0.75 0.25%	4-LF	95	95	100	100	100	75	75	84	91	97	
Pyrithiobac + glyphosate + AG-98	0.031 0.75 0.25%	4-LF	0	0	55	93	98	0	0	46	71	86	
Pyrithiobac + glyphosate + AG-98 <i>fb</i>	0.31 0.75 0.25%	2-LF											
glyphosate AG-98	0.75 0.75	4-LF	91	91	99	100	99	73	73	83	94	94	
Glyphosate <i>fb</i> glyphosate	0.75 0.75	2-LF 4-LF	86	86	100	99	91	69	70	71	88	93	
LSD (0.05)			3	3	5	4	2	10	10	9	7	4	

continued

Table 5. Section 2.

Herbicide	Application		Weed control										
			Smooth pigweed (AMACH)					Carpetweed (MOLVE)					
			Rate (lb/A)	timing	6/13	6/16	6/21	6/28	7/6	6/13	6/16	6/21	6/28
			----- (%) -----										
Untreated check			0	0	0	0	0	0	0	0	0	0	0
Pyrithiobac (Staple) + fluometuron (Cotoran) <i>fb</i>	0.031 0.94	PRE											
pyrithiobac + quizalofop (Assure) + AG-98	0.063 0.063 0.25% <sup>z</sup>		99	99	99	96	96	100	100	100	100	100	100
Pyrithiobac + fluometuron <i>fb</i>	0.031 0.94	PRE											
pyrithiobac + glyphosate (Roundup Ultra) + AG-98	0.031 0.75 0.25%	4-LF	100	100	100	100	100	100	100	100	100	100	100
Pyrithiobac <i>fb</i> pyrithiobac + glyphosate + AG-98	0.031 0.031 0.75 0.25%	PRE 4-LF	96	96	99	100	99	100	100	100	100	100	100
Pyrithiobac + glyphosate + AG-98 <i>fb</i>	0.031 0.75 0.25%	2-LF											
pyrithiobac + glyphosate + AG-98	0.031 0.75 0.25%	4-LF	100	100	100	100	99	100	100	100	100	100	100
Pyrithiobac + glyphosate + AG-98	0.031 0.75 0.25%	4-LF	0	0	65	100	100	0	0	90	100	98	
Pyrithiobac + glyphosate + AG-98 <i>fb</i>	0.031 0.75 0.25%	2-LF											
glyphosate AG-98	0.75 0.25%	4-LF	99	99	99	100	99	100	100	100	100	100	100
Glyphosate <i>fb</i> glyphosate	0.75 0.75	2-LF 4-LF	99	99	100	99	93	100	100	100	100	100	96
LSD (0.05)			3	3	8	2	2	1	1	3	1	2	

continued

**Table 5. Section 3.**

Herbicide	Rate (lb/A)	Application timing	Annual grasses <sup>y</sup>			Cotton injury				
			6/21	6/28	7/6	6/13	6/16	6/21	6/28	7/6
			----- (%) -----							
Untreated check			0	0	0	0	0	0	0	0
Pyrithiobac (Staple) + fluometuron (Cotoran) <i>fb</i>	0.031 0.94	PRE								
pyrithiobac + quizalofop (Assure) + AG-98	0.063 0.063 0.25% <sup>z</sup>	4-LF	100	99	99	9	9	14	8	8
Pyrithiobac + fluometuron <i>fb</i>	0.031 0.94	PRE								
pyrithiobac + glyphosate (Roundup Ultra) + AG-98	0.031 0.75 0.25%	4-LF	100	99	100	5	5	14	6	10
Pyrithiobac <i>fb</i>	0.031	PRE								
pyrithiobac + glyphosate + AG-98	0.031 0.75 0.25%	4-LF	83	96	99	1	1	14	4	1
Pyrithiobac + glyphosate + AG-98 <i>fb</i>	0.031 0.75 0.25%	2-LF								
pyrithiobac + glyphosate + AG-98	0.031 0.75 0.25%	4-LF	100	100	100	6	6	10	5	3
Pyrithiobac + glyphosate + AG-98	0.031 0.75 0.25%	4-LF	59	93	99	0	0	13	4	0
Pyrithiobac + glyphosate + AG-98 <i>fb</i>	0.031 0.75 0.25%	2-LF								
glyphosate	0.75	4-LF	100	100	99	11	11	0	1	1
Glyphosate <i>fb</i>	0.75	2-LF								
glyphosate	0.75	4-LF	100	100	95	0	0	0	0	0
LSD (0.05)			14	6	3	3	3	3	6	4

<sup>z</sup> Rate in vol/vol.

<sup>y</sup> Mix of goosegrass, large crabgrass, and broadleaf signalgrass.

**Table 6. Herbicide systems with pyriithiobac (Staple) and glyphosate (Roundup Ultra), Rohwer, 1999.****TEST INFORMATION**

Location .....	Rohwer	Crop / Cultivar .....	cotton / DP5415RR
Experimental Design / replications .....	RCB / 4	Seeding rate .....	12 lb/A
Plot size .....	12.7 ft x 35 ft	Planting date / Harvest date .....	May 28, 1999 / N/A
Row width / Number of rows per plot .....	38" / 4	Soil type .....	silt loam (16% sand, 67% silt, 17% clay)
		% OM / pH .....	2.2 / 5.5

Comments: PRE = preemergence; EPOST = early postemergence over-the-top; MPOST = mid-postemergence over-the-top; and DIR = post-directed.

Application type	PRE	EPOST	MPOST & DIR
Date applied	May 20, 1999	June 10, 1999	June 25, 1999
Time	8:00 am	10:00 am	10:00 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	78 / 60	85 / 86	85 / 70
Relative humidity (%)	30	70	78
Wind (mph)	4	5	4
Cloud cover (%)	0	0	0
Soil moisture	optimal	dry	optimal
Crop stage/Height	N/A	2-3 lf / 8"	6-8 lf / 18"
Sprayer type/mph	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 4.2
Nozzle type/Size	Flat fan / 11003	Flat fan / 11004	Flat fan / 8002 VS
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19	4 / 8 / 19
Gpa / Psi	15 / 22	15 / 24	15 / 24
<b>Weed species</b> (density)	----- (no. of leaves) -----		
ECHCG (mod.)	N/A	2-3 lf	2-5 lf
BRAPP (mod.)	N/A	2-3 lf	3-5 lf
IPOLA (mod.)	N/A	2-4 lf	2-6 lf
SIDSP (mod.)	N/A	2-3 lf	2-5 lf
DIGSA (mod.)	N/A	2-4 lf	2-6 lf
AMARE (mod.)	N/A	2-3 lf	2-6 lf

Conclusions: Pyriithiobac and clomazone were evaluated for their fit in glyphosate-tolerant cotton programs. Pyriithiobac and pyriithiobac + fluometuron tankmixes applied PRE *fb* glyphosate EPOST and pyriithiobac + fluometuron PRE *fb* glyphosate MPOST were equal to sequential applications of glyphosate made at EPOST *fb* MPOST. When glyphosate applications were delayed to MPOST, morningglory control was reduced following pyriithiobac alone. Fluometuron + prometryn *fb* glyphosate, pyriithiobac + fluometuron *fb* pyriithiobac + glyphosate and clomazone *fb* glyphosate provided significantly less control of pitted morningglory than the two applications of glyphosate. Pyriithiobac *fb* pyriithiobac + glyphosate also provided less control of large crabgrass and barnyardgrass. No differences were noted for control of any species between the pyriithiobac + fluometuron *fb* pyriithiobac + quizalofop and the two applications of glyphosate. No treatments with soil-applied residual herbicides were superior to the two post application of glyphosate for control of grasses, pitted morningglory, prickly sida, and redroot pigweed. Clomazone PRE *fb* glyphosate MPOST provided excellent control of grasses, but morningglory control was low. Pyriithiobac + fluometuron or clomazone + fluometuron applied PRE may offer some flexibility in glyphosate application timing, but did not improve control of morningglory, prickly sida, barnyardgrass, large crabgrass, broadleaf signalgrass, or redroot pigweed over two POST applications of glyphosate.

**Table 6. Section 1.**

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Barnyardgrass (ECHCG)			Large crabgrass (DIGSA)			Broadleaf signalgrass (BRAPP)	
			6/10	6/21	7/7	6/10	6/21	7/7	6/10	6/21
Untreated check			0	0	0	0	0	0	0	0
Pyrithiobac (Staple) + fluometuron (Cotoran) <i>fb</i>	0.031 0.94	PRE								
pyrithiobac + quizalofop (Assure II) + AG-98	0.063 0.063 0.25% <sup>z</sup>	MPOST	95	85	86	98	95	91	91	89
Pyrithiobac + fluometuron <i>fb</i>	0.031 0.94	PRE								
pyrithiobac + glyphosate (Roundup Ultra) + AG-98	0.031 0.75 0.25%	DIR	94	81	90	96	96	94	98	96
Pyrithiobac <i>fb</i> pyrithiobac + glyphosate + AG-98	0.031 0.031 0.75 0.25%	DIR	70	43	55	78	64	63	94	89
Pyrithiobac + glyphosate + AG-98 <i>fb</i>	0.031 0.75 0.25%	EPOST								
pyrithiobac + glyphosate + AG-98	0.031 0.75 0.25%	DIR	0	100	97	0	100	99	0	100
Pyrithiobac + glyphosate + AG-98 <i>fb</i>	0.031 0.75 0.25%	EPOST								
glyphosate glyphosate	0.75 0.75	DIR	0	100	97	0	100	98	0	100
Glyphosate <i>fb</i> glyphosate	0.75 0.75	DIR	0	98	95	0	100	98	0	100
Clomazone (Command) <i>fb</i> pyrithiobac	1.0 0.063	PRE								
pyrithiobac	0.063	MPOST	99	99	100	100	100	100	100	100
Clomazone + fluometuron <i>fb</i>	0.5 0.75	PRE								
pyrithiobac	0.063	MPOST	95	91	93	94	93	93	100	100
Clomazone + fluometuron <i>fb</i>	0.75 0.75	PRE								
pyrithiobac	0.063	MPOST	98	100	95	94	94	93	96	96

**continued**

Table 6. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Barnyardgrass (ECHCG)			Large crabgrass (DIGSA)			Broadleaf signalgrass (BRAPP)	
			6/10	6/21	7/7	6/10	6/21	7/7	6/10	6/2
----- (%) -----										
Clomazone + fluometuron <i>fb</i> pyrithiobac	1.0 0.5 0.063	PRE MPOST	95	94	96	93	94	97	98	98
Clomazone <i>fb</i> glyphosate	1.0 0.75	PRE DIR	98	98	95	88	89	93	100	100
Clomazone + fluometuron <i>fb</i> glyphosate	1.0 0.75	PRE DIR	96	96	100	99	99	100	100	100
Clomazone + fluometuron <i>fb</i> glyphosate	0.75 0.75	PRE DIR	96	96	100	94	94	99	88	88
Clomazone + fluometuron <i>fb</i> glyphosate	0.5 0.75	PRE DIR	98	98	96	95	95	95	94	93
Fluometuron + prometryn (Caparol) <i>fb</i> glyphosate	0.75 0.75	PRE DIR	98	98	92	83	83	96	94	94
LSD (0.05)			11	13	14	12	14	12	9	10

continued

**Table 6. Section 2.**

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Redroot pigweed (AMARE)			Pitted morningglory (IPOLA)			Prickly sida (SIDSP)		
			6/10	6/21	7/7	6/10	6/21	7/7	6/10	6/21	7/7
			----- (%) -----								
Untreated check			0	0	0	0	0	0	0	0	0
Pyrithiobac (Staple) + fluometuron (Cotoran) <i>fb</i>	0.031 0.94	PRE									
pyrithiobac + quizalofop (Assure II) + AG-98	0.063 0.063 0.25% <sup>z</sup>	MPOST	100	100	100	94	90	89	100	100	99
Pyrithiobac + fluometuron <i>fb</i>	0.031 0.94	PRE									
pyrithiobac + glyphosate (Roundup) + AG-98	0.031 0.75 0.25%	DIR	100	100	100	94	90	76	96	93	100
Pyrithiobac <i>fb</i>	0.031	PRE									
pyrithiobac + glyphosate + AG-98	0.031 0.75 0.25%	DIR	100	100	100	80	66	50	96	90	86
Pyrithiobac + glyphosate + AG-98 <i>fb</i>	0.031 0.75 0.25%	EPOST									
pyrithiobac + glyphosate + AG-98	0.031 0.75 0.25%	DIR	0	100	100	0	94	98	0	100	100
Pyrithiobac + glyphosate + AG-98 <i>fb</i>	0.031 0.75 0.25%	EPOST									
glyphosate	0.75	DIR	0	100	100	0	91	98	0	99	100
Glyphosate <i>fb</i> glyphosate	0.75 0.75	EPOST DIR	0	100	100	0	90	96	0	99	97

**continued**

Table 6. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Redroot pigweed (AMARE)			Pitted morningglory (IPOLA)			Prickly sida (SIDSP)		
			6/10	6/21	7/7	6/10	6/21	7/7	6/10	6/21	7/7
----- (%) -----											
Clomazone (Command) <i>fb</i>	1.0	PRE									
pyrithiobac	0.063	MPOST	73	73	75	20	15	44	99	99	96
Clomazone + fluometuron <i>fb</i>	0.5 0.75	PRE									
pyrithiobac	0.063	MPOST	95	90	95	94	89	89	99	99	98
Clomazone + fluometuron <i>fb</i>	0.75 0.75	PRE									
pyrithiobac	0.063	MPOST	100	100	100	89	81	84	100	100	98
Clomazone + fluometuron <i>fb</i>	1.0 0.5	PRE									
pyrithiobac	0.063	MPOST	100	100	100	84	81	85	100	100	100
Clomazone <i>fb</i> glyphosate	1.0 0.75	PRE DIR	89	83	83	43	33	13	98	98	97
Clomazone + fluometuron <i>fb</i>	1.0 0.75	PRE									
glyphosate	0.75	DIR	100	100	100	89	84	75	100	100	100
Clomazone + fluometuron <i>fb</i>	0.75 0.75	PRE									
glyphosate	0.75	DIR	99	99	96	89	80	70	98	98	96
Clomazone + fluometuron <i>fb</i>	0.5 0.75	PRE									
glyphosate	0.75	DIR	100	100	100	90	85	63	100	100	99
Fluometuron + prometryn (Caparol) <i>fb</i>	0.75 0.75	PRE									
glyphosate	0.75	DIR	99	99	87	93	89	76	100	100	94
LSD (0.05)			17	18	23	20	20	32	3	4	10

<sup>z</sup> Rate in vol/vol.



**Table 7. Pyriithiobac (Staple) / bromoxynil (Buctril) combinations, Fayetteville, 1999.**

**TEST INFORMATION**

Location .....	Fayetteville	Crop / Cultivar .....	cotton / BXN47
Experimental Design / replications .....	RCB / 4	Seeding rate .....	4 / ft
Plot size .....	3.3 ft x 27 ft	Planting date / Harvest date .....	June 3, 1999 / N/A
Row width / Number of rows per plot .....	40 in. / 1	Soil type .....	Taloka silt loam (28% sand, 64% silt, 8% clay)
		% OM .....	1.2

Comments: GRASS = grass treatment (clethodim, 0.25 lb ai/A + AG-98 over entire test); and EOT = early over-the-top.

Application type	GRASS	EOT
Date applied	June 14, 1999	June 15, 1999
Time	11:30 am	6:00 am
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	80 /	62 / 60
Relative humidity (%)	65	70
Wind (mph)	5	0
Cloud cover (%)	0	30
Soil moisture	moist	moist
Crop stage/Height	cot. / 3"	cot. / 3"
Sprayer type/mph	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3
Nozzle type/Size	Flat fan / XR8002VS	Flat fan / XR8002VS
Boom ht / # Noz / Spacing (in.)	21 / 2 / 18	21 / 2 / 18
Gpa / Psi	15 / 26	15 / 26
<b>Weed species</b> (density) ----- [no. of leaves / height (in.)] -----		
AMACH (36/m <sup>2</sup> )	N/A	2-5 lf / 0.4-1.4"
IPOLA (20/m <sup>2</sup> )	N/A	cot.- 2 lf / 1-1.5"
IPOHG (12/m <sup>2</sup> )	N/A	cot. - 1 lf / 0.75-1"
SIDSP (50/m <sup>2</sup> )	N/A	cot. - 1 lf / 0.5-0.75"
ABUTH (40/m <sup>2</sup> )	N/A	2 lf / 1"
CYPES	N/A	emerging

Conclusions: The pyriithiobac/bromoxynil (Staple/Buctril) tank mixtures controlled smooth pigweed and prickly sida better than bromoxynil alone and controlled pitted and entireleaf morningglories better than pyriithiobac or bromoxynil alone. For morningglories, there was a significant rate response between pyriithiobac 0.031 (1/2 X rate) and 0.047 lb ai/A, but control between 0.047 and 0.063 lb/A was equal, although there was no rate response with pyriithiobac/bromoxynil tank mixtures. Control of prickly sida was better with pyriithiobac alone than with bromoxynil alone if the pyriithiobac rate was at least 0.047 lb/A. Prickly sida was small (cot. to 1 leaf) at application, enhancing potential for control with pyriithiobac. Prickly sida control tended to be best with the higher rates of the pyriithiobac/bromoxynil tank mixtures (0.047 lb/A pyriithiobac + 0.375 or 0.5 lb/A bromoxynil). All treatments controlled velvetleaf. A striking contrast in nutsedge control was observed, with no control in plots treated with bromoxynil alone and 98 to 100% control in all plots treated with pyriithiobac. In summary, where morningglories, nutsedge, and prickly sida are a problem, a mixture of pyriithiobac and bromoxynil would provide better control than either herbicide alone. More work needs to be done on these weeds at later growth stages.

**Table 7. Section 1.**

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Smooth pigweed (AMACH)			Pitted morningglory (IPOLA)			Entireleaf morningglory (IPOHG)		
			6/21	6/28	7/12	6/21	6/28	7/12	6/21	6/28	7/12
			----- (%) -----								
Untreated check			0	0	0	0	0	0	0	0	0
Pyrithiobac (Staple - 0.5 oz ai/A) + Activate Plus	0.031 0.25% <sup>z</sup>	EOT	95	100	96	70	74	56	71	74	56
Pyrithiobac (0.75 oz ai/A) + Activate Plus	0.047 0.25%	EOT	97	99	98	75	81	70	75	81	70
Pyrithiobac (1 oz ai/A) + Activate Plus	0.063 0.25%	EOT	99	100	99	76	85	73	75	85	73
Bromoxynil (Buctril)	0.375	EOT	99	98	89	99	99	65	98	97	64
Bromoxynil	0.5	EOT	99	99	91	99	100	85	99	100	83
Pyrithiobac + bromoxynil + Activate Plus	0.031 0.375 0.25%	EOT	98	100	99	99	99	97	99	99	98
Pyrithiobac + bromoxynil + Activate Plus	0.031 0.50 0.25%	EOT	99	100	100	99	100	96	99	100	98
Pyrithiobac + bromoxynil + Activate Plus	0.047 0.375 0.25%	EOT	98	100	99	97	99	98	97	100	97
Pyrithiobac + bromoxynil + Activate Plus	0.047 0.5 0.25%	EOT	98	100	100	99	100	99	98	100	99
LSD (0.05)			3	1	6	3	4	10	2	4	9

**continued**

**Table 7. Section 2.**

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Prickly sida (SIDSP)			Velvetleaf (ABUTH)		
			6/21	6/28	7/12	6/21	6/28	7/12
Untreated check			0	0	0	0	0	0
Pyrithiobac (Staple - 0.5 oz ai/A)	0.031							
+ Activate Plus	0.25% <sup>z</sup>	EOT	75	86	75	94	100	100
Pyrithiobac (0.75 oz ai/A) +	0.047							
Activate Plus	0.25%	EOT	81	96	91	88	100	100
Pyrithiobac (1 oz ai/A) +	0.063							
Activate Plus	0.25%	EOT	81	98	93	94	100	100
Bromoxynil (Buctril)	0.375	EOT	60	60	43	100	100	100
Bromoxynil	0.5	EOT	73	73	50	100	100	100
Pyrithiobac +	0.031							
bromoxynil +	0.375							
Activate Plus	0.25%	EOT	69	97	81	100	100	100
Pyrithiobac +	0.031							
bromoxynil +	0.50							
Activate Plus	0.25%	EOT	83	99	89	100	100	100
Pyrithiobac +	0.047							
bromoxynil +	0.375							
Activate Plus	0.25%	EOT	81	99	94	98	100	100
Pyrithiobac +	0.047							
bromoxynil +	0.5							
Activate Plus	0.25%	EOT	85	100	99	100	100	100
LSD (0.05)			14	10	11	4	1	1

continued

**Table 7. Section 3.**

Herbicide	Rate (lb/A)	Application timing	Yellow nutsedge (CYPES)		Cotton injury		
			7/12	6/21	6/28	7/12	
			----- (%) -----				
Untreated check			0	0	0	0	0
Pyrithiobac (Staple - 0.5 oz ai/A) + Activate Plus	0.031 0.25% <sup>z</sup>	EOT	100	0	1	1	1
Pyrithiobac (0.75 oz ai/A) + Activate Plus	0.047 0.25%	EOT	100	0	0	1	1
Pyrithiobac (1 oz ai/A) + Activate Plus	0.063 0.25%	EOT	100	0	3	5	5
Bromoxynil (Buctril)	0.375	EOT	0	0	0	0	0
Bromoxynil	0.5	EOT	0	0	1	0	0
Pyrithiobac + bromoxynil + Activate Plus	0.031 0.375 0.25%	EOT	99	0	5	5	5
Pyrithiobac + bromoxynil + Activate Plus	0.031 0.50 0.25%	EOT	98	0	5	4	4
Pyrithiobac + bromoxynil + Activate Plus	0.047 0.375 0.25%	EOT	99	0	6	9	9
Pyrithiobac + bromoxynil + Activate Plus	0.047 0.5 0.25%	EOT	99	0	5	3	3
LSD (0.05)			1	NS	NS	5	5

<sup>z</sup> Rate in vol/vol.

**Table 8. Pyriithiobac (Staple) / bromoxynil (Buctril) combinations, Little Rock, 1999.**

**TEST INFORMATION**

Location .....	Little Rock	Crop / Cultivar .....	cotton / BXN47
Experimental Design / replications .....	RCB / 4	Seeding rate .....	12 lb / A
Plot size .....	10 ft x 40 ft	Planting date / Harvest date .....	May 26, 1999 / N/A
Row width / Number of rows per plot .....	30" / 4	Soil type .....	silt loam (28% sand, 56% silt, 16% clay)
		% OM .....	1

Comments: 2-3 LF = 2- to 3-leaf cotton. Trifluralin, 0.375 lb ai/A, was applied PPI over entire test area May 26.

Application type	2-3 LF
Date applied	June 11, 1999
Time	6:00 am
Incorporation equipment	N/A
Air/Soil temperature (F)	80
Wind (mph)	0
Cloud cover (%)	40
Soil moisture	adequate
Crop stage/Height	2-3 lf / 4"
Sprayer type/mph	BkPkCO <sub>2</sub> / 3
Nozzle type/Size	Flat fan / XR11002
Boom ht / # Noz / Spacing (in.)	21 / 8 / 19
Gpa / Psi	20 / 42
<b>Weed species</b> (density)	----- (no. of leaves) -----
IPOLA (1.5/ft <sup>2</sup> )	cot.-3 lf
SIDSP (5/ft <sup>2</sup> )	cot.-2 lf
AMAPA (5/ft <sup>2</sup> )	cot.-5 lf
XANST (1/ft <sup>2</sup> )	cot.-3 lf

Conclusions: Tank mixtures of pyriithiobac + bromoxynil generally controlled weeds better than either herbicide alone, especially at the low rate of the single herbicides. Even low rates were effective in tank mixtures. Although the yellow nutsedge population was inadequate to rate, pyriithiobac appeared to suppress yellow nutsedge while bromoxynil did not.

**Table 8. Section 1.**

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Palmer amaranth (AMAPA)			Prickly sida (SIDSP)			Pitted morningglory (IPOLA)		
			6/21	6/28	7/6	6/21	6/28	7/6	6/21	6/28	7/6
			----- (%) -----								
Untreated check			0	0	0	0	0	0	0	0	0
Pyrithiobac (Staple - 0.5 oz ai/A) + Activate Plus	0.031 0.25%	2-3 LF	64	66	69	55	64	58	60	78	61
Pyrithiobac (0.75 oz ai/A) + Activate Plus	0.047 0.25%	2-3 LF	50	69	68	49	56	74	48	68	69
Pyrithiobac (1 oz ai/A) + Activate Plus	0.063 0.25%	2-3 LF	56	81	81	59	81	85	56	84	85
Bromoxynil (Buctril)	0.375	2-3 LF	35	61	78	79	86	96	73	75	80
Bromoxynil	0.5	2-3 LF	83	81	86	91	94	98	90	90	90
Pyrithiobac + bromoxynil + Activate Plus	0.031 0.375 0.25%	2-3 LF	91	93	93	93	96	98	93	94	90
Pyrithiobac + bromoxynil + Activate Plus	0.031 0.50 0.25%	2-3 LF	99	98	97	99	97	97	88	96	93
Pyrithiobac + bromoxynil + Activate Plus	0.047 0.375 0.25%	2-3 LF	95	93	94	97	96	96	86	93	94
Pyrithiobac + bromoxynil + Activate Plus	0.047 0.5 0.25%	2-3 LF	97	97	97	99	99	99	90	96	97
LSD (0.05)			22	16	14	11	11	7	13	13	12

**continued**

**Table 8. Section 2.**

Herbicide	Rate (lb/A)	Application timing	Common cocklebur (XANST) control			Cotton injury		
			6/21	6/28	7/6	6/21	6/28	7/6
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Pyrithiobac (Staple - 0.5 oz ai/A) + Activate Plus	0.031 0.25%	2-3 LF	61	78	60	0	0	0
Pyrithiobac (0.75 oz ai/A) + Activate Plus	0.047 0.25%	2-3 LF	53	76	69	0	0	0
Pyrithiobac (1 oz ai/A) + Activate Plus	0.063 0.25%	2-3 LF	59	93	88	5	1	3
Bromoxynil (Buctril)	0.375	2-3 LF	91	78	93	0	0	0
Bromoxynil	0.5	2-3 LF	95	95	89	0	0	0
Pyrithiobac + bromoxynil + Activate Plus	0.031 0.375 0.25%	2-3 LF	98	98	96	0	3	1
Pyrithiobac + bromoxynil + Activate Plus	0.031 0.50 0.25%	2-3 LF	100	100	100	0	1	0
Pyrithiobac + bromoxynil + Activate Plus	0.047 0.375 0.25%	2-3 LF	100	100	96	1	0	1
Pyrithiobac + bromoxynil + Activate Plus	0.047 0.5 0.25%	2-3 LF	98	96	100	0	4	0
LSD (0.05)			9	17	13	1	NS	NS

<sup>z</sup> Rate in vol/vol.

**Table 9. Pyriithiobac (Staple) and bromoxynil (Buctril) sequential applications, Rohwer, 1999.****TEST INFORMATION**

Location .....	Rohwer	Crop / Cultivar .....	cotton / BXN47
Experimental Design / replications .....	RCB / 4	Seeding rate .....	12 lb / A
Plot size .....	12.66 ft x 35 ft	Planting date / Harvest date ...	May 24, 1999 / Oct. 12, 1999
Row width / Number of rows per plot .....	38" / 4	Soil type .....	silt loam (16% sand, 67% silt, 17% clay)
		% OM .....	2.2

Comments: PRE = preemergence and EPOST = early postemergence. Sethoxydim, 0.125 lb ai/A, was applied June 29 over entire test area for grass control.

Application type	PRE	EPOST
Date applied	May 18, 1999	June 11, 1999
Time	7:00 am	7:00 am
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	64 / 60	75 / 80
Wind (mph)	2	2
Cloud cover (%)	0	0
Soil moisture	optimal	dry
Crop stage/Height	N/A	2-4 lf / 4"
Sprayer type/mph	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3
Nozzle type/Size	Flat fan / 11003	Flat fan / 11003
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19
Gpa / Psi	15 / 22	15 / 25
<b>Weed species</b> (density)	----- (no. of leaves) -----	
BRAPP (mod.)	N/A	3-4 lf
ECHCG (hvy.)	N/A	2-3 lf
IPLA (mod.)	N/A	1-3 lf
ABUTH (lt.)	N/A	2 lf
SIDSP (mod.)	N/A	2 lf
POROL (mod.)	N/A	2 lf
CYPIR (mod.)	N/A	2-3 lf

Conclusions: Excellent control of morningglory, velvetleaf, and prickly sida was achieved with all rates of pyriithiobac and pyriithiobac combinations applied PRE or PRE *fb* EPOST in mid-season evaluations. Poor grass control was provided with all combinations and timings of pyriithiobac, fluometuron, and bromoxynil. A blanket application of sethoxydim made in mid-season effectively removed grasses from the study. Pyriithiobac + fluometuron PRE *fb* pyriithiobac EPOST provided control of morningglory as good as that from pyriithiobac PRE *fb* pyriithiobac + bromoxynil EPOST. There was no rate response to pyriithiobac at 0.031 and 0.043 lb/A. There was a rate response on morningglory to bromoxynil when the rate was increased from 0.38 to 0.5 lb/A. Excellent control of prickly sida and velvetleaf was achieved with all rates and timings of pyriithiobac + bromoxynil. Bromoxynil alone at 0.5 lb/A provided excellent control of velvetleaf but poor control of prickly sida at this rate. Poor control of prickly sida and velvetleaf was noted at the 0.38 lb/A rate also. Multiple applications of pyriithiobac offered good suppression to complete control of rice flatsedge. All herbicide-treated plots yielded significantly more than the untreated check, and the plots with multiple applications of pyriithiobac or pyriithiobac *fb* bromoxynil yielded more than plots treated with bromoxynil alone.



Table 9. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Broadleaf signalgrass (BRAPP)	Barnyard- grass (ECHCG)	Pitted morningglory (IPOLA)		Velvetleaf (ABUTH)	
			6/25	6/25	6/25	7/26	6/25	7/26
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Pyrithiobac (Staple) + fluometuron (Cotoran) <i>fb</i>	0.031 0.94	PRE						
pyrithiobac + AG-98	0.063 0.25% <sup>z</sup>	EPOST	89	96	100	97	100	100
Pyrithiobac + fluometuron <i>fb</i>	0.043 0.94	PRE						
pyrithiobac + AG-98	0.063 0.25%	EPOST	90	93	99	95	100	100
Pyrithiobac <i>fb</i>	0.031	PRE						
pyrithiobac + AG-98	0.063 0.25%	EPOST	45	25	100	84	100	100
Pyrithiobac <i>fb</i>	0.043	PRE						
pyrithiobac + AG-98	0.063 0.25%	EPOST	68	53	97	90	100	100
Pyrithiobac <i>fb</i>	0.031	PRE						
pyrithiobac + bromoxynil (Buctril) + AG-98	0.031 0.38 0.25%	EPOST	65	33	97	88	100	100
Pyrithiobac <i>fb</i>	0.031	PRE						
pyrithiobac + bromoxynil + AG-98	0.031 0.5 0.25%	EPOST	48	40	98	92	100	100
Pyrithiobac <i>fb</i>	0.031	PRE						
pyrithiobac + bromoxynil + AG-98	0.047 0.38 0.25%	EPOST	46	38	99	83	100	98
Pyrithiobac <i>fb</i>	0.031	PRE						
pyrithiobac + bromoxynil + AG-98	0.047 0.5 0.25%	EPOST	55	41	95	92	100	98
Pyrithiobac <i>fb</i>	0.043	PRE						
pyrithiobac + bromoxynil + AG-98	0.031 0.38 0.25%	EPOST	65	48	96	78	100	100

continued

Table 9. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Broadleaf signalgrass (BRAPP)	Barnyard- grass (ECHCG)	Pitted morningglory (IPOLA)		Velvetleaf (ABUTH)	
			6/25	6/25	6/25	7/26	6/25	7/26
			----- (%) -----					
Pyrithiobac <i>fb</i>	0.043	PRE						
pyrithiobac + bromoxynil + AG-98	0.031 0.5 0.25%							
Pyrithiobac <i>fb</i>	0.043	PRE						
pyrithiobac + bromoxynil + AG-98	0.047 0.38 0.25%	EPOST	53	58	95	64	100	98
Pyrithiobac <i>fb</i>	0.043	PRE						
pyrithiobac + bromoxynil + AG-98	0.047 0.38 0.25%	EPOST	68	56	98	80	100	100
Pyrithiobac <i>fb</i>	0.043	PRE						
pyrithiobac + bromoxynil + AG-98	0.047 0.5 0.25%	EPOST	58	44	100	88	100	100
Pyrithiobac <i>fb</i>	0.031	PRE						
bromoxynil	0.38	EPOST	38	38	95	60	100	100
Pyrithiobac <i>fb</i>	0.031	PRE						
bromoxynil	0.5	EPOST	41	25	99	79	100	100
Pyrithiobac <i>fb</i>	0.043	PRE						
bromoxynil	0.38	EPOST	46	31	94	74	100	100
Pyrithiobac <i>fb</i>	0.043	PRE						
bromoxynil	0.5	EPOST	33	58	99	78	100	100
Bromoxynil	0.38	EPOST	44	20	94	48	100	75
Bromoxynil	0.5	EPOST	30	0	98	41	100	98
LSD (0.05)			32	30	7	22	1	10

continued

**Table 9. Section 2.**

Herbicide	Rate (lb/A)	Application timing	Weed control				Seedcotton yield 10/12
			Common purslane (POROL)	Rice flatsedge (CYPIR)	Prickly sida (SIDSP)		
			6/25	7/26	6/25	7/26	
Untreated check			0	0	0	25	1077
Pyrithiobac (Staple) + fluometuron (Cotoran) <i>fb</i>	0.031 0.94	PRE					
pyrithiobac + AG-98	0.063 0.25% <sup>z</sup>	EPOST	100	100	100	100	3446
Pyrithiobac + fluometuron <i>fb</i>	0.043 0.94	PRE					
pyrithiobac + AG-98	0.063 0.25%	EPOST	100	100	100	100	2987
Pyrithiobac <i>fb</i>	0.031	PRE					
pyrithiobac + AG-98	0.063 0.25%	EPOST	100	95	100	100	3313
Pyrithiobac <i>fb</i>	0.043	PRE					
pyrithiobac + AG-98	0.063 0.25%	EPOST	100	97	100	100	3340
Pyrithiobac <i>fb</i>	0.031	PRE					
pyrithiobac + bromoxynil (Buctril) + AG-98	0.031 0.38 0.25%	EPOST	100	88	100	99	3417
Pyrithiobac <i>fb</i>	0.031	PRE					
pyrithiobac + bromoxynil + AG-98	0.031 0.5 0.25%	EPOST	100	92	100	100	3462
Pyrithiobac <i>fb</i>	0.031	PRE					
pyrithiobac + bromoxynil + AG-98	0.047 0.38 0.25%	EPOST	100	92	100	100	3412
Pyrithiobac <i>fb</i>	0.031	PRE					
pyrithiobac + bromoxynil + AG-98	0.047 0.5 0.25%	EPOST	99	97	100	100	3156

continued

Table 9. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control				Seedcotton yield 10/12
			Common purslane (POROL)	Rice flatsedge (CYPUR)	Prickly sida (SIDSP)		
			6/25	7/26	6/25	7/26	
			----- (%) -----				
Pyrithiobac <i>fb</i>	0.043	PRE					
pyrithiobac + bromoxynil + AG-98	0.031 0.38 0.25%	EPOST	98	87	100	100	3236
Pyrithiobac <i>fb</i>	0.043	PRE					
pyrithiobac + bromoxynil + AG-98	0.031 0.5 0.25%	EPOST	100	97	100	100	3009
Pyrithiobac <i>fb</i>	0.043	PRE					
pyrithiobac + bromoxynil + AG-98	0.047 0.38 0.25%	EPOST	98	74	100	98	3296
Pyrithiobac <i>fb</i>	0.043	PRE					
pyrithiobac + bromoxynil + AG-98	0.047 0.5 0.25%	EPOST	100	96	100	100	3560
Pyrithiobac <i>fb</i>	0.031	PRE					
bromoxynil	0.38	EPOST	63	63	100	100	2777
Pyrithiobac <i>fb</i>	0.031	PRE					
bromoxynil	0.5	EPOST	78	60	100	95	3211
Pyrithiobac <i>fb</i>	0.043	PRE					
bromoxynil	0.38	EPOST	78	79	100	100	2916
Pyrithiobac <i>fb</i>	0.043	PRE					
bromoxynil	0.5	EPOST	70	71	100	99	3026
Bromoxynil	0.038	EPOST	3	0	100	58	1832
Bromoxynil	0.5	EPOST	13	3	100	63	2576
LSD (0.05)			20	26	1	20	530

<sup>z</sup> Rate in vol/vol.

Table 10. Herbicide systems for BXN cotton, Rohwer, 1999.

## TEST INFORMATION

Location .....	Rohwer	Crop / Cultivar .....	cotton / BXN47
Experimental Design / replications .....	RCB / 4	Seeding rate .....	12 lb / A
Plot size .....	12.66 ft x 35 ft	Planting date / Harvest date ...	May 24, 1999 / Oct. 12, 1999
Row width / Number of rows per plot .....	38" / 4	Soil type .....	silt loam (16% sand, 67% silt, 17% clay)
		% OM .....	2.2

Comments: PPI = preplant incorporated; PRE = preemergence; EOT = early over-the-top (2- to 4-lf cotton); LOT = late over-the-top (8-lf cotton); DIR = post-directed (8-lf cotton); and LAYBY = 10- to 12-leaf cotton.

Application type	PPI	PRE	EOT	LOT	DIR	LAYBY
Date applied	May 17, 1999	May 19, 1999	June 11, 1999	June 29, 1999	June 29, 1999	July 7, 1999
Time	2:00 pm	8:00 am	9:00 am	3:00 pm	4:00 pm	1:00 pm
Incorporation equipment	N/A	N/A	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	90 / 80	82 / 76	84 / 80	90 / 75	90 / 75	94 / 83
Wind (mph)	10	3	4	6	5	4
Cloud cover (%)	30	0	30	100	100	0
Soil moisture	optimal	optimal	dry	wet	wet	dry
Crop stage/Height	N/A	N/A	2-4 lf / 10"	8 lf / 18"	8 lf / 18"	10-12 lf / 20"
Sprayer type/mph	Levelband/3	BkPkCO <sub>2</sub> /3	BkPkCO <sub>2</sub> /3	Tractor CO <sub>2</sub> /3	Tractor CO <sub>2</sub> /3	Tractor CO <sub>2</sub> /3
Nozzle type/Size						
Boom ht / # Noz /	Flood / TK5	Flat fan / 11003	Flat fan / 11003	Flat fan / 8002	Flat fan / 8002	Flood / TK5
Spacing (in.)	22 / 4 / --	22 / 8 / 19	22 / 8 / 19	22 / 8 / 19	4 / 8 / 20	8 / 8 / 38
Gpa / Psi	10 / 18	15 / 22	15 / 25	15 / 24	15 / 26	11 / 25
<b>Weed species (density)</b>	----- (no. of leaves) -----					
BRAPP (mod.)	N/A	N/A	2-4 lf	4-6 lf	2-8 lf	2-10 lf
ECHCG (hvy.)	N/A	N/A	2-4 lf	2-4 lf	2-5 lf	2-8 lf
IPOLA (hvy.)	N/A	N/A	3 lf	4-5 lf	2-6 lf	2-8 lf
AMARE (mod.)	N/A	N/A	3-4 lf	4-5 lf	2-6 lf	2-10 lf
POROL (mod.)	N/A	N/A	2-4 lf	3 lf	2-5 lf	2-8 lf
ABUTH (lt.)	N/A	N/A	3 lf	4-5 lf	2-6 lf	2-8 lf

Conclusions: The study was established to evaluate weed control and yield potential of BXN cotton grown under a Buctril (bromoxynil) system and with a conventional herbicide program. Trifluralin PPI *fb* fluometuron or clomazone PRE was more effective on barnyardgrass and broadleaf signalgrass than trifluralin PPI *fb* pyriithiobac PRE. There was a rate response to fluometuron in that the 1 lb/A rate following trifluralin provided more grass control than 0.75 lb/A following trifluralin. Clomazone alone PRE provided excellent grass control 38 DAT and was equal to clomazone + pyriithiobac PRE. Morningglory, pigweed, and velvetleaf control was greater than 90% 38 DAT in treatments containing trifluralin PPI and fluometuron at 1 lb/A or pyriithiobac at 0.043 lb/A PRE. Control of morningglory dropped in those treatments containing 0.75 lb/A fluometuron PRE. Velvetleaf and pigweed control was slightly reduced in plots with trifluralin *fb* fluometuron at 0.75 lb/A, but not with clomazone + fluometuron at 0.75 lb/A. At 70 days after PRE and 28 days after the 8-in. applications, grass control was greater than 90% in those treatments that received prometryn + MSMA as a directed spray or clomazone PRE. Pigweed control was greater than 90% in all treatments except clomazone PRE *fb* bromoxynil at 8 in. and trifluralin PPI *fb* a low rate of fluometuron PRE *fb* bromoxynil at 8 in. Prickly sida control was excellent in all treatments. Morningglory was not effectively controlled with the low rates of clomazone PRE *fb* low rates of fluometuron PRE *fb* pyriithiobac at 8 in. or by high rates of clomazone PRE *fb* pyriithiobac at 8 in. All treated plots yielded significantly greater than the untreated check. Trifluralin PPI *fb* pyriithiobac PRE *fb* two sequential applications of bromoxynil yielded less than the standard trifluralin *fb* fluometuron *fb* bromoxynil. High competition from grasses in the early season may have been responsible for the lower yield.

Table 10. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Broadleaf signalgrass (BRAPP)		Barnyardgrass (ECHCG)		Pitted morningglory (IPOLA)		Redroot pigweed (AMARE)	
			6/24	7/26	6/24	7/26	6/24	7/26	6/24	7/26
			----- (%) -----							
Untreated check			0	0	0	0	0	0	0	0
Trifluralin (Treflan) <i>fb</i>	1.0	PPI								
fluometuron (Cotoran) <i>fb</i>	1.0	PRE								
bromoxynil (Buctril) <i>fb</i>	0.5	EOT								
bromoxynil	0.5	LOT	96	79	97	80	100	100	100	100
Trifluralin <i>fb</i>	1.0	PPI								
fluometuron +	1.0									
pyrithiobac (Staple) <i>fb</i>	0.043	PRE								
prometryn (Caparol FL)	1.0									
+ MSMA <i>fb</i>	2.0	DIR								
cyanazine (Bladex) +	0.75									
MSMA	2.0	LAYBY	96	95	89	88	47	78	100	100
Trifluralin <i>fb</i>	1.0	PPI								
fluometuron <i>fb</i>	1.0	PRE								
pyrithiobac <i>fb</i>	0.043	EOT								
prometryn +	1.0									
MSMA <i>fb</i>	2.0	DIR								
cyanazine +	0.75									
MSMA	2.0	LAYBY	93	92	94	93	98	100	100	100
Trifluralin <i>fb</i>	1.0	PPI								
pyrithiobac +	0.043									
fluometuron <i>fb</i>	1.0	PRE								
pyrithiobac <i>fb</i>	0.043	EOT								
prometryn +	1.0									
MSMA <i>fb</i>	2.0	DIR								
cyanazine +	0.75									
MSMA	2.0	LAYBY	98	100	99	96	96	100	100	100

continued

Table 10. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Broadleaf signalgrass (BRAPP)		Barnyardgrass (ECHCG)		Pitted morningglory (IPOLA)		Redroot pigweed (AMARE)	
			6/24	7/26	6/24	7/26	6/24	7/26	6/24	7/26
----- (%) -----										
Trifluralin <i>fb</i>	1.0	PPI								
fluometuron <i>fb</i>	1.0	PRE								
pyrithiobac + bromoxynil <i>fb</i>	0.043 0.5	EOT								
bromoxynil	0.5	LOT	96	95	92	89	100	100	100	100
Trifluralin <i>fb</i>	1.0	PPI								
pyrithiobac <i>fb</i>	0.043	PRE								
pyrithiobac + bromoxynil <i>fb</i>	0.043 0.5	EOT								
bromoxynil	0.5	LOT	81	89	95	81	100	100	100	100
Trifluralin <i>fb</i>	1.0	PPI								
pyrithiobac <i>fb</i>	0.043	PRE								
bromoxynil <i>fb</i>	0.5	EOT								
bromoxynil	0.5	LOT	50	35	64	48	98	95	100	100
Trifluralin <i>fb</i>	1.0	PPI								
fluometuron + pyrithiobac <i>fb</i>	1.0 0.043	PRE								
bromoxynil <i>fb</i>	0.5	EOT								
bromoxynil	0.5	LOT	82	75	94	81	100	100	100	100
Clomazone (Command) <i>fb</i>	1.0	PRE								
pyrithiobac	0.054	LOT	98	93	97	91	13	76	45	100
Clomazone + fluometuron <i>fb</i>	0.5 0.75	PRE								
pyrithiobac	0.054	LOT	96	91	98	91	59	80	98	100
Clomazone + fluometuron <i>fb</i>	0.75 0.75	PRE								
pyrithiobac	0.054	LOT	98	96	100	95	65	84	98	100

continued

Table 10. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Broadleaf signalgrass (BRAPP)		Barnyardgrass (ECHCG)		Pitted morningglory (IPOLA)		Redroot pigweed (AMARE)	
			6/24	7/26	6/24	7/26	6/24	7/26	6/24	7/26
			----- (%) -----							
Clomazone + fluometuron <i>fb</i>	1.0 0.5	PRE								
pyrithiobac	0.054	LOT	99	91	99	94	71	100	94	100
Clomazone <i>fb</i> bromoxynil	0.75 0.5	PRE LOT	100	89	100	86	8	93	15	50
Clomazone + fluometuron <i>fb</i> bromoxynil	1.0 0.75 0.5	PRE LOT	100	96	100	98	71	99	98	100
Clomazone + fluometuron <i>fb</i> bromoxynil	0.75 0.75 0.5	PRE LOT	98	93	100	97	85	98	100	100
Trifluralin <i>fb</i> fluometuron <i>fb</i> bromoxynil <i>fb</i> clomazone + carfentrazone (Aim) + Agri-Dex	1.0 0.75 0.5 0.75 0.031 0.25% <sup>z</sup>	PPI PRE LOT  LAYBY	55	64	71	53	49	100	68	75
Trifluralin <i>fb</i> fluometuron <i>fb</i> bromoxynil <i>fb</i> clomazone + carfentrazone + Agri-Dex	1.0 0.75 0.5 0.75 0.015 0.25%	PPI PRE LOT  LAYBY	54	61	72	49	60	100	74	86
LSD (0.05)			26	28	18	18	31	14	28	20

continued



Table 10. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control			Effect on cotton	
			Common purslane (POROL)	Velvetleaf (ABUTH)	Prickly sida (SIDSP)	Injury	Seedcotton yield
			6/24	6/24	7/26	6/24	10/12
Untreated check			0	0	0	0	664
Trifluralin (Treflan) <i>fb</i>	1.0	PPI					
fluometuron (Cotoran) <i>fb</i>	1.0	PRE					
bromoxynil (Buctril) <i>fb</i>	0.5	EOT					
bromoxynil	0.5	LOT	100	100	100	8	3428
Trifluralin <i>fb</i>	1.0	PPI					
fluometuron +	1.0						
pyrithiobac (Staple) <i>fb</i>	0.043	PRE					
prometryn (Caparol FL)	1.0						
+ MSMA <i>fb</i>	2.0	DIR					
cyanazine (Bladex) +	0.75						
MSMA	2.0	LAYBY	100	75	100	3	3251
Trifluralin <i>fb</i>	1.0	PPI					
fluometuron <i>fb</i>	1.0	PRE					
pyrithiobac <i>fb</i>	0.043	EOT					
prometryn +	1.0						
MSMA <i>fb</i>	2.0	DIR					
cyanazine +	0.75						
MSMA	2.0	LAYBY	100	100	100	4	3542
Trifluralin <i>fb</i>	1.0	PPI					
pyrithiobac +	0.043						
fluometuron <i>fb</i>	1.0	PRE					
pyrithiobac <i>fb</i>	0.043	EOT					
prometryn +	1.0						
MSMA <i>fb</i>	2.0	DIR					
cyanazine +	0.75						
MSMA	2.0	LAYBY	100	100	100	4	3207

continued

Table 10. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control			Effect on cotton	
			Common purslane (POROL)	Velvetleaf (ABUTH)	Prickly sida (SIDSP)	Injury	Seedcotton yield
			6/24	6/24	7/26	6/24	10/12
			----- (%) -----			(lb/A)	
Trifluralin <i>fb</i>	1.0	PPI					
fluometuron <i>fb</i>	1.0	PRE					
pyrithiobac + bromoxynil <i>fb</i>	0.043 0.5	EOT					
bromoxynil	0.5	LOT	100	100	100	3	3702
Trifluralin <i>fb</i>	1.0	PPI					
pyrithiobac <i>fb</i>	0.043	PRE					
pyrithiobac + bromoxynil <i>fb</i>	0.043 0.5	EOT					
bromoxynil	0.5	LOT	100	100	100	5	3574
Trifluralin <i>fb</i>	1.0	PPI					
pyrithiobac <i>fb</i>	0.043	PRE					
bromoxynil <i>fb</i>	0.5	EOT					
bromoxynil	0.5	LOT	91	100	100	5	2695
Trifluralin <i>fb</i>	1.0	PPI					
fluometuron + pyrithiobac <i>fb</i>	1.0 0.043	PRE					
bromoxynil <i>fb</i>	0.5	EOT					
bromoxynil	0.5	LOT	100	100	100	15	3126
Clomazone (Command) <i>fb</i>	1.0	PRE					
pyrithiobac	0.054	LOT	91	88	100	0	3672
Clomazone + fluometuron <i>fb</i>	0.5 0.75	PRE					
pyrithiobac	0.054	LOT	99	100	100	6	3476
Clomazone + fluometuron <i>fb</i>	0.75 0.75	PRE					
pyrithiobac	0.054	LOT	98	100	100	1	3840

continued

Table 10. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control			Effect on cotton	
			Common purslane (POROL) 6/24	Velvetleaf (ABUTH) 6/24	Prickly sida (SIDSP) 7/26	Injury 6/24	Seedcotton yield 10/12
			----- (%) -----				(lb/A)
Clomazone + fluometuron <i>fb</i>	1.0 0.5	PRE					
pyrithiobac	0.054	LOT	100	100	100	6	3379
Clomazone <i>fb</i> bromoxynil	0.75 0.5	PRE LOT	89	100	100	0	3143
Clomazone + fluometuron <i>fb</i> bromoxynil	1.0 0.75 0.5	PRE LOT	100	100	100	5	3560
Clomazone + fluometuron <i>fb</i> bromoxynil	0.75 0.75 0.5	PRE LOT	100	100	100	6	3492
Trifluralin <i>fb</i> fluometuron <i>fb</i> bromoxynil <i>fb</i>	1.0 0.75 0.5	PPI PRE LOT					
clomazone + carfentrazone (Aim) + Agri-Dex	0.75 0.031 0.25% <sup>z</sup>		88	43	100	3	3210
Trifluralin <i>fb</i> fluometuron <i>fb</i> bromoxynil <i>fb</i> clomazone + carfentrazone + Agri-Dex	1.0 0.75 0.5 0.75 0.015 0.25%	PPI PRE LOT LAYBY	95	60	100	0	3516
LSD (0.05)			10	27	1	NS	651

<sup>z</sup> Rate in vol/vol.

Table 11. CGA 362622 cotton selectivity and efficacy, Fayetteville, 1999.

## TEST INFORMATION

Location .....	Fayetteville	Crop / Cultivar .....	cotton / Paymaster 1220 BR
Experimental Design / replications .....	RCB / 4	Seeding rate .....	4 / ft
Plot size .....	3.3 ft x 27 ft	Planting date / Harvest date .....	June 3, 1999 / N/A
Row width / Number of rows per plot .....	40" / 1	Soil type .....	Taloka silt loam (28% sand, 64% silt, 8% clay)
		% OM .....	1.2

Comments: Because no PRE herbicide was applied, the weed populations were quite high in this test and weeds were too tall to post-direct at the 8- to 12-in. cotton stage. Therefore, the weedy half of each plot was sprayed over-the-top when the cotton was 8 inches tall, and the weed-free half was post-directed when cotton was 11 inches tall. Cotton injury is reported for the weed-free plots. EOT = early over-the-top (3-in. cotton) (clethodim, 0.25 lb ai/A + AG-98 applied for grass control on all plots); EDIR = early post-directed (4-in. cotton); OT/DIR = weeds sprayed over-the-top, and cotton in weed-free plots was post-directed at 10 inches. DAT = days after treatment (each treatment was rated 7, 14, and 21 DAT).

Application type	EOT / GRASS	EOT	EDIR	OT (WEEDS)	LDIR (COT)
Date applied	June 14, 1999	June 15, 1999	June 21, 1999	July 2, 1999	July 8, 1999
Time	11:30 am	6:00 am		8:00 pm	10:00 am
Incorporation equipment	N/A	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	80 / 80	62 / 60	77 / 76	79 / 80	87 / 88
Relative humidity (%)	60	70	85	75	88
Wind (mph)	8	0	2	3	2
Cloud cover (%)	20	30	30	0	25
Soil moisture	moist	moist	very wet	wet	moist
Crop stage/Height	cot. / 2.5"	cot. / 3"	1-2 lf / 4-5"	4-5 lf / 8"	6-7 lf / 11"
Sprayer type/mph	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3
Nozzle type/Size	Flat fan/XR8002VS	Flat fan/XR8002VS	Flat fan/OC-01	Flat fan/XR8002VS	Flat fan/OC-01
Boom ht/# Noz/					
Spacing (in.)	20 / 2 / 18	20 / 2 / 18	3 / 2 / 18	30 / 2 / 18	6 / 2 / 18
Gpa / Psi	15 / 21	15 / 21	15 / 23	15 / 20	15 / 23
<b>Weed species</b> (density)	----- (no. of leaves / inches) -----				
DIGSA (100/m <sup>2</sup> )	1-5 lf / 1-2"	1-5 lf / 0.75-2"	N/A	N/A	sprayed weed-free
AMACH (20/m <sup>2</sup> )	N/A	2-5 lf / 0.75-1.5"	6-7 lf / 2-2.5"	7-many lf / 4-15"	"
IPOLA (16/m <sup>2</sup> )	N/A	cot.-2 lf / 1-1.5"	2-4 lf / 1.5-3"	many lf / 12-20"	"
IPOHG (10/m <sup>2</sup> )	N/A	cot.-1 lf / 0.75-1.25"	2-4 lf / 2"	many lf / 12-20"	"
SIDSP (36/m <sup>2</sup> )	N/A	cot.-1 lf / 0.5-0.75"	2-3 lf / 0.5-1"	5-10 lf / 3-5"	"
ABUTH (36/m <sup>2</sup> )	N/A	2 lf / 1"	2-4 lf / 1.5-3"	7 lf / 6-13"	"

Conclusions: Activity of CGA 362622 was much like pyriithiobac, except control of prickly sida was much lower, and injury from late (8-in. cotton) over-the-top applications was 30 to 50% (red veinal areas and leaf chlorosis and necrosis). Control of pitted and entireleaf morningglory was equal to or slightly higher than with pyriithiobac at the 3-in. cotton stage. At the 4- to 5-in. cotton stage, 0.0067 lb/A (7.5 g/ha) gave better morningglory control than 0.0045 lb/A (5 g/ha). Because of regrowth of morningglories after EOT applications and lack of grass activity, CGA-362622 will need to be integrated into a herbicide program.

**Table 11. Section 1.**

Herbicide	Rate (lb/A)	Application timing	Weed control										
			Smooth pigweed (AMACH)					Pitted morningglory (IPOLA)					
			7 DAT <sup>z</sup>	14 DAT	21 DAT	7/20	8/3	7 DAT	14 DAT	21 DAT	7/20	8/3	
----- (%) -----													
Untreated check			0	0	0	0	0	0	0	0	0	0	0
CGA 362622 +	0.0045												
AG-98	0.25% <sup>y</sup>	EOT	99	100	100	99	99	76	91	92	64	53	
CGA 362622 +	0.0045												
AG-98	0.25%	EDIR	99	98	86	85	84	78	90	64	63	60	
CGA 362622 +	0.0067												
AG-98	0.25%	EDIR	100	99	98	98	96	84	93	90	76	75	
CGA 362622 +	0.0067												
AG-98	0.25%	OT/LDIR	59	78	81	81	74	48	88	89	89	76	
CGA 362622 +	0.0134												
AG-98	0.25%	OT/LDIR	65	86	89	89	81	54	85	88	88	90	
Pyriithiobac (Staple) +	0.062												
AG-98	0.25%	EOT	98	100	100	100	100	73	85	84	59	31	
Fluometuron (Cotoran) +	0.8												
MSMA +	2.0												
AG-98	0.25%	EDIR	99	97	90	84	91	86	89	84	64	85	
Cyanazine (Bladex) +	0.8												
MSMA +	2.0												
AG-98	0.25%	OT/LDIR	55	63	61	61	64	80	88	89	89	83	
LSD (0.05)			7	9	13	13	16	7	4	7	10	13	

continued

Table 11. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control											
			Entireleaf morningglory (IPOHG)					Prickly sida (SIDSP)						
			7 DAT <sup>z</sup>	14 DAT	21 DAT	7/20	8/3	7 DAT	14 DAT	21 DAT	7/20	8/3		
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
CGA 362622 + AG-98	0.0045 0.25% <sup>y</sup>	EOT	76	91	92	94	50	78	60	60	28	14		
CGA 362622 + AG-98	0.0045 0.25%	EDIR	78	90	65	63	60	49	50	28	28	10		
CGA 362622 + AG-98	0.0067 0.25%	EDIR	84	93	90	76	75	59	61	51	34	48		
CGA 362622 + AG-98	0.0067 0.25%	OT/LDIR	48	88	88	88	74	25	54	58	58	46		
CGA 362622 + AG-98	0.0134 0.25%	OT/LDIR	54	85	88	88	90	30	63	65	65	58		
Pyrithiobac (Staple) + AG-98	0.062 0.25%	EOT	73	85	84	59	39	84	94	96	83	70		
Fluometuron (Cotoran) + MSMA + AG-98	0.8 2.0 0.25%	EDIR	86	86	83	64	83	70	71	84	65	76		
Cyanazine (Bladex) + MSMA + AG-98	0.8 2.0 0.25%	OT/LDIR	80	88	90	89	83	54	74	75	75	74		
LSD (0.05)			7	4	8	10	14	6	13	14	15	16		

continued

Herbicide Evaluation in Arkansas Cotton, 1999

**Table 11. Section 3.**

Herbicide	Application Rate (lb/A)	Application timing	Velvetleaf (ABUTH) control					Cotton injury					
			7 DAT <sup>z</sup>	14 DAT	21 DAT	7/20	8/3	7 DAT	14 DAT	21 DAT	7/20	8/3	
			----- (%) -----										
Untreated check			0	0	0	0	0	0	0	0	0	0	0
CGA 362622 +	0.0045												
AG-98	0.25% <sup>y</sup>	EOT	73	97	93	65	70	0	0	3	0	0	0
CGA 362622 +	0.0045												
AG-98	0.25%	EDIR	95	93	76	66	81	0	0	0	0	0	0
CGA 362622 +	0.0067												
AG-98	0.25%	EDIR	96	94	81	88	84	0	0	0	0	0	0
CGA 362622 +	0.0067												
AG-98	0.25%	OT/LDIR	60	95	95	95	99	0	0	3	3	0	0
CGA 362622 +	0.0134												
AG-98	0.25%	OT/LDIR	66	95	97	97	100	0	0	0	1	0	0
Pyriithiobac (Staple) +	0.062												
AG-98	0.25%	EOT	81	100	99	100	100	0	0	3	1	0	0
Fluometuron (Cotoran) +	0.8												
MSMA +	2.0												
AG-98	0.25%	EDIR	56	41	36	21	5	0	0	0	0	0	0
Cyanazine (Bladex) +	0.8												
MSMA +	2.0												
AG-98	0.25%	OT/LDIR	45	40	38	38	10	14	0	1	1	0	0
<b>LSD (0.05)</b>			<b>8</b>	<b>8</b>	<b>15</b>	<b>17</b>	<b>15</b>	<b>1</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>

<sup>z</sup>See comments

<sup>y</sup>Rate in vol/vol.

Table 12. CGA 362622 cotton selectivity and efficacy, Marianna, 1999.

## TEST INFORMATION

Location .....	Marianna	Crop / Cultivar .....	cotton / Paymaster 1220BR
Experimental Design / replications .....	RCB / 4	Seeding rate .....	12 lb/A
Plot size .....	12.7 ft x 35 ft	Planting date / Harvest date .....	May 18, 1999 / N/A
Row width / Number of rows per plot .....	38" / 4	Soil type .....	silt loam (2% sand, 86% silt, 12% clay)
		% OM / pH .....	1.1 / 5.5

Comments: Trifluralin, 0.75 lb ai/A PPI was applied May 18. EOT = over-the-top at 3-4 leaf cotton; EDIR = early post-directed at 5-6 leaf cotton; and LDIR = late post-directed at 8-9 leaf cotton.

Application type	EOT	EDIR	LDIR
Date applied	June 13, 1999	June 17, 1999	June 28, 1999
Time	9:00 am	10:00 am	10:00 am
Incorporation equipment	N/A	N/A	N/A
Air temperature (F)	75	78	80
Wind (mph)	0	N/A	8
Cloud cover (%)	35	N/A	80
Soil moisture	adequate	adequate	adequate
Crop stage	3-4 lf	5-6 lf	8-9 lf
Sprayer type/mph	Tractor-CO <sub>2</sub> / 3	Tractor-CO <sub>2</sub> / 3	Tractor-CO <sub>2</sub> / 3
Nozzle type/Size	Flat fan / 8003	Flat Fan / OCO2	Flat fan / 8003
Boom ht / # Noz / Spacing (in.)	19 / 2 / 19	- / 2 / -	- / 2 / -
Gpa / Psi	20 / 28	12 / 22	20 / 40
<b>Weed species</b> (density)	-----	(no. of leaves)	-----
SIDSP (5/ft <sup>2</sup> )	N/A	cot. - 4 lf	cot. - 6 lf
AMACH (2.5/ft <sup>2</sup> )	N/A	cot. - 4 lf	cot. - 6 lf
IPOLA (1/ft <sup>2</sup> )	N/A	cot. - 5 lf	cot. - 7 lf

Conclusions: CGA 362522 has potential to control pitted morningglory and smooth pigweed. However, prickly sida control was very poor. As with pyriithobac, early over-the-top applications need sequential POST treatments to maintain an adequate level of control, and a grass herbicide will be needed with CGA-362622.



**Table 12. Section 1.**

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Prickly sida (SIDSP)				Pitted morningglory (IPOLA)				
			6/21	6/28	7/6	7/19	6/21	6/28	7/6	7/19	
Untreated check			0	0	0	0	0	0	0	0	0
CGA 362622 + AG-98	0.0045 0.25% <sup>z</sup>	EOT	18	30	33	28	40	66	63	61	
CGA 362622 + AG-98	0.0045 0.25%	EDIR		68	29	10		74	84	74	
CGA 362622 + AG-98	0.0067 0.25%	EDIR		69	45	36		84	86	81	
CGA 362622 + AG-98	0.0067 0.25%	LDIR		0	20	23		0	55	81	
CGA 362622 + AG-98	0.0134 0.25%	LDIR		0	28	50		0	48	90	
Pyriithiobac (Staple) + AG-98	0.063 0.25%	EOT	75	79	86	93	61	81	86	90	
Fluometuron (Cotoran) + MSMA	0.8 2.0	EDIR		11	18	18		43	40	45	
Cyanazine (Bladex) + MSMA	0.8 2.0	LDIR		0	94	94		0	89	90	
LSD (0.05)			10	15	20	19	16	10	20	13	

continued

**Table 12. Section 2.**

Herbicide	Rate (lb/A)	Application timing	Smooth pigweed (AMACH) control				Cotton injury			
			6/21	6/28	7/6	7/19	6/21	6/28	7/6	7/19
			----- (%) -----				-----			
Untreated check			0	0	0	0	0	0	0	0
CGA 362622 + AG-98	0.0045 0.25% <sup>z</sup>	EOT	100	99	95	90	9	4	0	0
CGA 362622 + AG-98	0.0045 0.25%	EDIR		68	96	92		0	0	0
CGA 362622 + AG-98	0.0067 0.25%	EDIR		99	98	96		0	0	0
CGA 362622 + AG-98	0.0067 0.25%	LDIR		0	60	98		0	0	0
CGA 362622 + AG-98	0.0134 0.25%	LDIR		0	80	100		0	3	0
Pyriithiobac (Staple) + AG-98	0.063 0.25%	EOT	100	100	98	98	0	4	1	0
Fluometuron (Cotoran) + MSMA	0.8 2.0	EDIR		45	59	55		0	0	0
Cyanazine (Bladex) + MSMA	0.8 2.0	LDIR		0	90	94		0	15	9
<b>LSD (0.05)</b>			<b>1</b>	<b>22</b>	<b>17</b>	<b>7</b>	<b>2</b>	<b>NS</b>	<b>5</b>	<b>3</b>

<sup>z</sup>Rate in vol/vol.

**Table 13. CGA 362622 cotton selectivity and efficacy, Rohwer, 1999.**

**TEST INFORMATION**

Location .....	Rohwer	Crop / Cultivar .....	cotton / DP 5415
Experimental Design / replications .....	RCB / 4	Seeding rate .....	12 lb/A
Plot size .....	12.7 ft x 35 ft	Planting date / Harvest date ...	May 24, 1999 / Oct. 12, 1999
Row width / Number of rows per plot .....	38" / 4	Soil type .....	silt loam (16% sand, 67% silt, 17% clay)
		% OM .....	2.2

Comments: EOT = early over-the-top (2-4 leaf cotton); EDIR = early post-directed (6-8 leaf cotton); and LDIR = late post-directed (10-12 leaf cotton).

Application type	EOT	EDIR	LDIR
Date applied	June 10, 1999	June 18, 1999	July 7, 1999
Time	11:00 am	9:00 am	11:00 a
Incorporation equipment	N/A	N/A	N/A
Air/soil temperature (F)	87 / 81	78 / 74	90 / 82
Wind (mph)	6	6	5
Cloud cover (%)	0	0	
Soil moisture	dry	dry	dry
Crop stage	2-4 lf (6 in.)	6-8 lf (11 in.)	10-12 lf (20 in.)
Sprayer type/mph	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3
Nozzle type/Size	Flat fan / 11004	Flat Fan / 11003	Flood / TK5
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19	8 / 8 / 38
Gpa / Psi	15 / 24	15 / 25	11 / 25
<b>Weed species</b> (density)	----- (no. of leaves) -----		
IPOLA (hvy.)	2-3 lf	2-6 lf	2-8 lf
POROL (mod.)	2-3 lf	3-5 lf	2-8 lf
SIDSP (mod.)	2-3 lf	3-5 lf	2-8 lf
CYPIR (mod.)	2-3 lf	3-6 lf	2-8 lf
ABUTH (mod.)	2-4 lf	3-6 lf	2-8 lf

Conclusions: The new Novartis compound CGA-362622 appears to have good activity on morningglory and annual sedge with good crop safety. Activity on prickly sida is very weak.

Table 13. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Pitted morningglory (IPOLA)			Common purslane (POROL)		Rice flatsedge (CYPIR)	
			6/21	7/7	7/26	6/21	7/7	6/21	7/7
Untreated check			0	0	0	0	0	0	0
CGA 362622 + AG-98	0.0045 0.25% <sup>z</sup>	EOT	90	93	81	0	91	95	96
CGA 362622 + AG-98	0.0045 0.25%	EDIR	0	91	84	0	95	0	93
CGA 362622 + AG-98	0.007 0.25%	EDIR	0	93	84	0	88	0	97
CGA 362622 + AG-98 <i>fb</i>	0.007 0.25%	EDIR							
CGA 362622 + AG-98	0.007 0.25%	LDIR	0	97	100	0	94	0	98
CGA 362622 + AG-98 <i>fb</i>	0.007 0.25%	EDIR							
CGA 362622 + AG-98	0.013 0.25%	LDIR	0	93	99	0	95	0	98
LSD (0.05)			1	7	9	NS	5	2	5

continued

**Table 13. Section 2.**

Herbicide	Rate (lb/A)	Application timing	Weed control				Effect on cotton		
			Prickly sida (SIDSP)			Velvetleaf (ABUTH)	Injury		Seedcotton yield
			6/21	7/7	7/26	7/26	6/21	7/7	10/12
Untreated check			0	0	0	0	0	0	688
CGA 362622 + AG-98	0.0045 0.25% <sup>z</sup>	EOT	3	0	0	63	1	0	2060
CGA 362622 + AG-98	0.0045 0.25%	EDIR	0	0	8	58	0	0	2218
CGA 362622 + AG-98	0.007 0.25%	EDIR	0	0	8	90	0	0	1888
CGA 362622 + AG-98 <i>fb</i>	0.007 0.25%	EDIR							
CGA 362622 + AG-98	0.007 0.25%	LDIR	0	0	43	83	0	0	1306
CGA 362622 + AG-98 <i>fb</i>	0.007 0.25%	EDIR							
CGA 362622 + AG-98	0.013 0.25%	LDIR	0	0	38	100	0	0	2217
LSD (0.05)			NS	NS	24	38	NS	NS	785

<sup>z</sup>Rate in vol/vol.

**Table 14. Residual herbicides in Roundup Ready® cotton, Rohwer, 1999.****TEST INFORMATION**

Location .....	Rohwer	Crop / Cultivar .....	cotton / DP5415RR
Experimental Design / replications .....	RCB / 4	Seeding rate .....	12 lb/A
Plot size .....	12.7 ft x 35 ft	Planting date / Harvest date .....	May 28, 1999 / N/A
Row width / Number of rows per plot .....	38" / 4	Soil type .....	silt loam (16% sand, 67% silt, 17% clay)
		% OM .....	2.2

Comments: PPI = preplant incorporated; EOT = early over-the-top; DIR = post-directed (8-leaf cotton); and LAYBY = post-directed at layby.

Application type	PPI	EOT	DIR	LAYBY
Date applied	May 21, 1999	June 18, 1999	June 29, 1999	July 7, 1999
Time	9:00 am	10:00 am	1:00 pm	8:30 am
Incorporation equipment	Triple K	N/A	N/A	N/A
Air/soil temperature (F)	67 / 68	78 / 74	87 / 74	88 / 80
Wind (mph)	9	7	5	5
Cloud cover (%)	0	0	60	0
Soil moisture	optimal	dry	optimal	optimal
Crop stage	N/A	3-4 lf / 10"	8 lf / 18"	10-12 lf / 24"
Sprayer type/mph	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3	Tractor-CO <sub>2</sub> / 3	Tractor-CO <sub>2</sub> / 3
Nozzle type/Size	Flat fan / 11003	Flat Fan / 11003	Flat fan / 8002	Flat fan / 8002
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19	4 / 8 / 19	4 / 8 / 19
Gpa / Psi	15 / 22	15 / 25	15 / 26	15 / 24
<b>Weed species</b> (density)	----- (no. of leaves) -----			
IPOLA (mod.)	N/A	2-4 lf	2-6 lf	2-8 lf
ECHCG (mod.)	N/A	2-4 lf	2-6 lf	2-8 lf
SIDSP (mod.)	N/A	2-4 lf	2-6 lf	2-10 lf
AMARE (mod.)	N/A	2-4 lf	2-8 lf	2-10 lf

Conclusions: Pendimethalin *fb* glyphosate *fb* glyphosate + diuron and the three sequential applications of glyphosate provided significantly less pitted morningglory control than the other two treatments. All treatments provided greater than 90% control of barnyardgrass, prickly sida, and redroot pigweed.

**Table 14. Section 1.**

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Barnyardgrass (ECHCG)				Large crabgrass (DIGSA)	Redroot pigweed (AMARE)	
			6/11	6/22	7/7	7/23	7/7	7/7	7/23
Untreated check			0	0	0	0	0	0	0
Glyphosate (Roundup Ultra) <i>fb</i>	0.75	EOT							
glyphosate <i>fb</i>	0.75	DIR							
glyphosate	0.75	LAYBY	0	38	95	95	99	100	100
Pendimethalin (Prowl) <i>fb</i>	1.0	PPI							
glyphosate <i>fb</i>	0.75	EOT							
glyphosate + diuron (Direx)	0.75	LAYBY	97	97	99	98	100	100	100
Glyphosate + metolachlor (Dual Magnum)	0.75	EOT							
<i>fb</i> glyphosate + fluometuron (Cotoran)	1.5	LAYBY	0	63	99	92	100	100	100
Pendimethalin <i>fb</i>	1.0	PPI							
glyphosate + pyrithiobac (Staple) <i>fb</i>	0.56	EOT							
glyphosate + diuron	0.063	LAYBY	95	96	100	94	100	100	100
Pendimethalin <i>fb</i>	0.75	PPI							
glyphosate <i>fb</i>	1.0	EOT							
glyphosate + pendimethalin	0.75	LAYBY	93	94	99	97	100	100	100
Pendimethalin + fluometuron <i>fb</i>	1.0	PPI							
pyrithiobac <i>fb</i>	1.0	EOT							
cyanazine (Bladex) + MSMA	0.063	LAYBY	90	90	69	53	76	100	100
Pendimethalin <i>fb</i>	0.75	PPI							
glyphosate <i>fb</i>	1.0	EOT							
cyanazine + MSMA	0.75	LAYBY	90	93	99	95	100	100	100
Pendimethalin <i>fb</i>	2.0	PPI							
glyphosate <i>fb</i>	1.0	EOT							
prometryn (Caparol FL) + MSMA <i>fb</i>	0.8	DIR							
cyanazine + MSMA	0.75	LAYBY	94	96	99	97	100	100	100
MSMA	2.0								
LSD (0.05)			12	16	14	28	15	1	1

continued

Table 14. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Pitted morningglory (IPOLA)				Prickly sida (SIDSP)				
			6/11	6/22	7/7	7/23	6/11	6/22	7/7	7/23	
Untreated check			0	0	0	0	0	0	0	0	0
Glyphosate (Roundup Ultra) <i>fb</i>	0.75	EOT									
glyphosate <i>fb</i>	0.75	DIR									
glyphosate	0.75	LAYBY	0	30	54	78	0	25	95	93	
Pendimethalin (Prowl) <i>fb</i>	1.0	PPI									
glyphosate <i>fb</i>	0.75	EOT									
glyphosate + diuron (Direx)	0.75	LAYBY	33	38	61	75	5	40	96	98	
Glyphosate + metolachlor (Dual Magnum) <i>fb</i> glyphosate + fluometuron (Cotoran)	1.5 0.75 1.0	EOT LAYBY	0	28	79	82	0	44	88	80	
Pendimethalin <i>fb</i>	1.0	PPI									
glyphosate + pyrithiobac (Staple) <i>fb</i>	0.56 0.063	EOT									
glyphosate + diuron	0.75	LAYBY	15	30	74	93	13	33	84	98	
Pendimethalin <i>fb</i>	1.0	PPI									
glyphosate <i>fb</i>	0.75	EOT									
glyphosate + pendimethalin	0.75 1.0	LAYBY	25	30	74	90	16	38	93	100	
Pendimethalin + fluometuron <i>fb</i>	1.0 1.0	PPI									
pyrithiobac <i>fb</i>	0.063	EOT									
cyanazine (Bladex) + MSMA	0.75 2.0	LAYBY	24	24	68	47	0	18	3	17	
Pendimethalin <i>fb</i>	1.0	PPI									
glyphosate <i>fb</i>	0.75	EOT									
cyanazine + MSMA	0.75 2.0	LAYBY	35	38	66	93	13	25	91	95	
Pendimethalin <i>fb</i>	1.0	PPI									
glyphosate <i>fb</i>	0.75	EOT									
prometryn (Caparol FL) + MSMA <i>fb</i>	0.8 2.0	DIR									
cyanazine + MSMA	0.75 2.0	LAYBY	21	34	84	93	13	30	95	90	
LSD (0.05)			NS	NS	34	29	NS	26	12	22	



**Table 15. Metolachlor (Dual) and prometryn (Caparol) in Roundup Ready® cotton, Rohwer, 1999.**

**TEST INFORMATION**

Location .....	Rohwer	Crop / Cultivar .....	cotton / DP5415RR
Experimental Design / replications .....	RCB / 4	Seeding rate .....	12 lb/A
Plot size .....	12.7 ft x 35 ft	Planting date / Harvest date ...	May 28, 1999 / Oct. 12, 1999
Row width / Number of rows per plot .....	38" / 4	Soil type .....	silt loam (16% sand, 67% silt, 17% clay)
		% OM .....	2.2

Comments: PPI = preplant incorporated; PRE = preemergence; and EOT = early over-the-top.

Application type	PPI	PRE	EOT
Date applied	May 20, 1999	May 21, 1999	June 18, 1999
Time	2:00 pm	6:00 am	8:00 am
Incorporation equipment	Triple K	N/A	N/A
Air/soil temperature (F)	85 / 76	77 / 76	78 / 75
Wind (mph)	7	4	4
Cloud cover (%)	0	0	0
Soil moisture	optimal	optimal	dry
Crop stage	N/A	N/A	2-4 lf / 8"
Sprayer type/mph	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3
Nozzle type/Size	Flat fan / 11003	Flat Fan / 11003	Flat fan / 11003
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19	22 / 8 / 19
Gpa / Psi	15 / 22	15 / 22	15 / 25
<b>Weed species</b> (density)	----- (no. of leaves) -----		
IPOLA (mod.)	N/A	N/A	3-5 lf
AMARE (mod.)	N/A	N/A	2-4 lf
SIDSP (mod.)	N/A	N/A	2-4 lf
BRAPP (mod.)	N/A	N/A	2-4 lf
ECHCG (mod.)	N/A	N/A	2-3 lf

Table 15. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Broadleaf signalgrass (BRAPP)		Barnyardgrass (ECHCG)		Large crabgrass (DIGSA)	
			6/11	6/21	6/11	6/21	6/11	6/21
Untreated check			0	0	0	20	0	0
Pendimethalin (Prowl) <i>fb</i>	1.0	PPI						
prometryn (Caparol FL) <i>fb</i>	1.0	PRE						
metolachlor (Dual Magnum)	0.95	EOT	95	94	98	96	96	96
Pendimethalin <i>fb</i>	1.0	PPI						
prometryn <i>fb</i>	1.0	PRE						
glyphosate (Roundup Ultra)	0.75							
+ metolachlor	0.95	EOT	96	100	98	100	98	100
Pendimethalin <i>fb</i>	1.0	PPI						
glyphosate +	0.75							
metolachlor	0.95	EOT	94	100	91	100	91	100
Pendimethalin <i>fb</i>	1.0	PPI						
glyphosate	0.75	EOT	93	100	81	100	84	100
Pendimethalin <i>fb</i>	1.0	PPI						
metolachlor	0.75	EOT	78	73	86	85	86	81
Pendimethalin	1.0	PPI	84	45	78	49	78	65
Prometryn +	1.0							
metolachlor	1.26	PRE	96	96	96	95	100	100
Prometryn +	1.0							
metolachlor <i>fb</i>	1.26	PRE						
glyphosate	0.75	EOT	100	100	95	100	92	100
Prometryn <i>fb</i>	1.0	PRE						
glyphosate +	0.75							
metolachlor	1.26	EOT	100	100	95	100	98	100
Prometryn <i>fb</i>	1.0	PRE						
glyphosate	0.75	EOT	99	100	93	100	95	100
Prometryn <i>fb</i>	1.0	PRE						
quizalofop (Assure II)	0.35	EOT	96	99	95	99	100	100
LSD (0.05)			10	12	12	32	13	7

continued

Table 15. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control						Seedcotton yield 10/12 (lb/A)
			Pitted morningglory (IPOLA)		Redroot pigweed (AMARE)		Prickly sida (SIDSP)		
			6/11	6/21	6/11	6/21	6/11	6/21	
Untreated check			0	0	0	0	0	0	762
Pendimethalin (Prowl) <i>fb</i>	1.0	PPI							
prometryn (Caparol FL) <i>fb</i>	1.0	PRE							
metolachlor (Dual Magnum)	0.95	EOT	72	58	99	100	97	93	1137
Pendimethalin <i>fb</i>	1.0	PPI							
prometryn <i>fb</i>	0.75	PRE							
glyphosate (Roundup Ultra)	0.75								
+ metolachlor	0.95	EOT	71	84	100	100	91	100	2159
Pendimethalin <i>fb</i>	1.0	PPI							
glyphosate +	0.75								
metolachlor	0.95	EOT	60	85	100	100	75	100	2327
Pendimethalin <i>fb</i>	1.0	PPI							
glyphosate	0.75	EOT	61	80	100	100	81	100	2438
Pendimethalin <i>fb</i>	1.0	PPI							
metolachlor	0.75	EOT	52	28	95	85	73	55	514
Pendimethalin	1.0	PPI	42	13	99	98	41	13	782
Prometryn +	1.0								
metolachlor	1.26	PRE	70	56	100	100	98	93	570
Prometryn +	1.0								
metolachlor <i>fb</i>	1.26	PRE							
glyphosate	0.75	EOT	81	95	100	100	88	100	2097
Prometryn <i>fb</i>	1.0	PRE							
glyphosate +	0.75								
metolachlor	1.26	EOT	78	93	100	100	92	100	1878
Prometryn <i>fb</i>	1.0	PRE							
glyphosate	0.75	EOT	79	90	98	100	85	99	2003
Prometryn <i>fb</i>	1.0	PRE							
quizalofop (Assure II)	0.35	EOT	71	45	100	100	96	85	685
LSD (0.05)			12	14	4	8	14	12	718

Table 16. Pendimethalin (Prowl) in Roundup Ready® cotton, Fayetteville, 1999.

## TEST INFORMATION

Location .....	Fayetteville	Crop / Cultivar .....	cotton / Paymaster 1220 BR
Experimental Design / replications .....	RCB / 4	Seeding rate .....	4 / ft
Plot size .....	3.3 ft x 27 ft	Planting date / Harvest date .....	June 3, 1999 / N/A
Row width / Number of rows per plot .....	40" / 1	Soil type .....	Taloka silt loam (27% sand, 64% silt, 9% clay)
		% OM .....	1.2

Comments: PPI = preplant incorporated; PRE = preemergence; EOT = early over-the-top; and DIR = directed.

Application type	PPI	PRE	EOT	DIR
Date applied	June 3, 1999	June 5, 1999	June 17, 1999	June 29, 1999
Time	11:00 am	6:00 am	7:00 am	2:30 pm
Incorporation equipment	Lilliston	N/A	N/A	N/A
Air/soil temperature (F)	85 / 80	74 / 72	60 / 60	82 / 87
Wind (mph)	3	4	3	2
Cloud cover (%)	40	20	30	75
Soil moisture	moist	moist	wet	wet
Crop stage	N/A	N/A	cot. - 1 lf / 3"	4 lf / 6"
Sprayer type/mph	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3
Nozzle type/Size	Flat fan / XR8002VS	Flat fan / XR8002VS	Flat fan / XR8002VS	Flat fan / OC-01
Boom ht / # Noz / Spacing (in.)	20 / 2 / 18	20 / 2 / 18	22 / 2 / 18	4 / 2 / 18
Gpa / Psi	15 / 21	15 / 21	15 / 26	15 / 20
<b>Weed species</b> (density)	----- [no. of leaves / height (in.)] -----			
DIGSA (30/m <sup>2</sup> )	N/A	N/A	1-3 lf / 0.375-0.5"	2 lf / 0.375"
AMACH (40/m <sup>2</sup> )	N/A	N/A	1-4 lf / 0.75-1"	N/A
IPOLA (30/m <sup>2</sup> )	N/A	N/A	cot. - 2 lf / 1-2.25"	2-3 lf / 2-3"
IPOHG (10/m <sup>2</sup> )	N/A	N/A	cot. - 2 lf / 0.75-2"	2 lf / 2"
SIDSP (35/m <sup>2</sup> )	N/A	N/A	1-2 lf / 0.375-0.75"	N/A
ABUTH (30/m <sup>2</sup> )	N/A	N/A	3 lf / 1-1.5"	N/A

Conclusions: Combinations of pendimethalin with fluometuron PRE or pyriithiobac EOT controlled pitted and entireleaf morningglory, smooth pigweed, and prickly sida by season's end better than pendimethalin alone followed by (*fb*) glyphosate EOT. These combination treatments also controlled morningglory species better than glyphosate EOT *fb* DIR or glyphosate EOT *fb* glyphosate + pendimethalin. Pendimethalin applied DIR caused moderate to severe lodging of cotton this year (in 1998 cotton was not injured by post-directed treatments).

**Table 16. Section 1.**

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Large crabgrass (DIGSA)				Smooth pigweed (AMACH)				
			6/17	6/29	7/13	7/27	6/17	6/29	7/13	7/27	
			----- (%) -----								
Untreated check			0	0	0	0	0	0	0	0	0
Pendimethalin (Prowl) <i>fb</i>	1.0	PPI									
fluometuron (Cotoran)	1.2	PRE	100	99	100	100	100	100	100	100	98
Pendimethalin <i>fb</i>	1.0	PPI									
glyphosate (Roundup Ultra)	1.0	EOT	100	100	96	99	98	100	95	91	
Pendimethalin <i>fb</i>	1.0	PPI									
glyphosate <i>fb</i>	1.0	EOT									
glyphosate	1.0	DIR	100	100	100	100	98	99	99	99	
Pendimethalin <i>fb</i>	1.0	PPI									
fluometuron <i>fb</i>	1.2	PRE									
glyphosate	1.0	EOT	100	100	100	100	100	100	99	99	
Fluometuron <i>fb</i>	1.2	PRE									
glyphosate	1.0	EOT	100	100	95	100	100	100	95	95	
Pendimethalin <i>fb</i>	1.0	PPI									
pyrithiobac (Staple) <i>fb</i>	0.042	PRE									
pyrithiobac +	0.042										
glyphosate	1.0	EOT	100	100	100	100	100	100	100	100	100
Pendimethalin <i>fb</i>	1.0	PPI									
pyrithiobac +	0.063										
AG-98 <i>fb</i>	0.25% <sup>z</sup>	EOT									
pendimethalin +	1.0										
MSMA (Bueno 6)	1.5	DIR	100	100	100	100	98	100	100	100	100
Pendimethalin <i>fb</i>	1.0	PPI									
fluometuron <i>fb</i>	1.2	PRE									
pyrithiobac +	0.063										
AG-98 <i>fb</i>	0.25%	EOT									
pendimethalin +	1.0										
MSMA	1.5	DIR	100	100	100	100	100	100	100	100	100
Glyphosate <i>fb</i>	1.0	EOT									
glyphosate	1.0	DIR	0	97	98	93	0	98	98	96	
Glyphosate <i>fb</i>	1.0	EOT									
pendimethalin +	1.0										
glyphosate	1.0	DIR	0	98	98	97	0	99	98	93	
LSD (0.05)			1	1	5	2	1	1	4	4	

continued

Table 16. Section 2.

Herbicide	Application Rate (lb/A)	Application timing	Weed control								
			Pitted morningglory (IPOLA)				Entireleaf morningglory (IPOHG)				
			6/17	6/29	7/13	7/27	6/17	6/29	7/13	7/27	
Untreated check			0	0	0	0	0	0	0	0	0
Pendimethalin (Prowl) <i>fb</i>	1.0	PPI									
fluometuron (Cotoran)	1.2	PRE	99	99	100	99	99	100	100	100	100
Pendimethalin <i>fb</i>	1.0	PPI									
glyphosate (Roundup Ultra)	1.0	EOT	63	98	95	89	63	99	98	89	
Pendimethalin <i>fb</i>	1.0	PPI									
glyphosate <i>fb</i>	1.0	EOT									
glyphosate	1.0	DIR	65	98	98	97	65	99	99	100	
Pendimethalin <i>fb</i>	1.0	PPI									
fluometuron <i>fb</i>	1.2	PRE									
glyphosate	1.0	EOT	100	100	99	96	99	100	100	99	
Fluometuron <i>fb</i>	1.2	PRE									
glyphosate	1.0	EOT	100	100	100	97	100	100	100	98	
Pendimethalin <i>fb</i>	1.0	PPI									
pyrithiobac (Staple) <i>fb</i>	0.042	PRE									
pyrithiobac +	0.042										
glyphosate	1.0	EOT	95	99	100	100	95	100	100	100	
Pendimethalin <i>fb</i>	1.0	PPI									
pyrithiobac +	0.063										
AG-98 <i>fb</i>	0.25% <sup>z</sup>	EOT									
pendimethalin +	1.0										
MSMA (Bueno 6)	1.5	DIR	63	95	100	96	63	98	100	100	
Pendimethalin <i>fb</i>	1.0	PPI									
fluometuron <i>fb</i>	1.2	PRE									
pyrithiobac +	0.063										
AG-98 <i>fb</i>	0.25%	EOT									
pendimethalin +	1.0										
MSMA	1.5	DIR	99	100	100	100	99	100	100	100	
Glyphosate <i>fb</i>	1.0	EOT									
glyphosate	1.0	DIR	0	85	97	81	0	93	97	89	
Glyphosate <i>fb</i>	1.0	EOT									
pendimethalin +	1.0										
glyphosate	1.0	DIR	0	87	96	80	0	93	97	81	
LSD (0.05)			2	2	2	11	2	4	2	8	

continued

**Table 16. Section 3.**

Herbicide	Application Rate timing (lb/A)		Weed control							
			Velvetleaf (ABUTH)				Prickly sida (SIDSP)			
			6/17	6/29	7/13	7/27	6/17	6/29	7/13	7/27
----- (%) -----										
Untreated check			0	0	0	0	0	0	0	0
Pendimethalin (Prowl) <i>fb</i>	1.0	PPI								
fluometuron (Cotoran)	1.2	PRE	100	100	100	99	100	100	100	100
Pendimethalin <i>fb</i>	1.0	PPI								
glyphosate (Roundup Ultra)	1.0	EOT	61	100	100	100	90	100	98	94
Pendimethalin <i>fb</i>	1.0	PPI								
glyphosate <i>fb</i>	1.0	EOT								
glyphosate	1.0	DIR	61	100	100	100	89	100	100	100
Pendimethalin <i>fb</i>	1.0	PPI								
fluometuron <i>fb</i>	1.2	PRE								
glyphosate	1.0	EOT	100	100	100	100	100	100	100	100
Fluometuron <i>fb</i>	1.2	PRE								
glyphosate	1.0	EOT	99	100	100	100	100	100	100	100
Pendimethalin <i>fb</i>	1.0	PPI								
pyrithiobac (Staple) <i>fb</i>	0.042	PRE								
pyrithiobac +	0.042									
glyphosate	1.0	EOT	92	100	100	100	100	100	100	100
Pendimethalin <i>fb</i>	1.0	PPI								
pyrithiobac +	0.063									
AG-98 <i>fb</i>	0.25% <sup>z</sup>	EOT								
pendimethalin +	1.0									
MSMA (Bueno 6)	1.5	DIR	61	100	100	100	86	100	100	100
Pendimethalin <i>fb</i>	1.0	PPI								
fluometuron <i>fb</i>	1.2	PRE								
pyrithiobac +	0.063									
AG-98 <i>fb</i>	0.25%	EOT								
pendimethalin +	1.0									
MSMA	1.5	DIR	100	100	100	100	100	100	100	100
Glyphosate <i>fb</i>	1.0	EOT								
glyphosate	1.0	DIR	0	99	100	100	0	99	100	100
Glyphosate <i>fb</i>	1.0	EOT								
pendimethalin +	1.0									
glyphosate	1.0	DIR	0	100	100	100	0	100	99	100
LSD (0.05)			2	1	1	1	7	1	1	3

continued

Table 16. Section 4.

Herbicide	Rate (lb/A)	Application timing	Cotton injury			
			6/17	6/29	7/13	7/27
			----- (%) -----			
Untreated check			0	0	0	0
Pendimethalin (Prowl) <i>fb</i>	1.0	PPI				
fluometuron (Cotoran)	1.2	PRE	9	5	10	1
Pendimethalin <i>fb</i>	1.0	PPI				
glyphosate (Roundup Ultra)	1.0	EOT	4	0	0	0
Pendimethalin <i>fb</i>	1.0	PPI				
glyphosate <i>fb</i>	1.0	EOT				
glyphosate	1.0	DIR	5	0	0	0
Pendimethalin <i>fb</i>	1.0	PPI				
fluometuron <i>fb</i>	1.2	PRE				
glyphosate	1.0	EOT	6	3	1	0
Fluometuron <i>fb</i>	1.2	PRE				
glyphosate	1.0	EOT	9	5	4	0
Pendimethalin <i>fb</i>	1.0	PPI				
pyrithiobac (Staple) <i>fb</i>	0.042	PRE				
pyrithiobac +	0.042					
glyphosate	1.0	EOT	13	10	25	1
Pendimethalin <i>fb</i>	1.0	PPI				
pyrithiobac +	0.063					
AG-98 <i>fb</i>	0.25% <sup>z</sup>	EOT				
pendimethalin +	1.0					
MSMA (Bueno 6)	1.5	DIR	5	1	15	20
Pendimethalin <i>fb</i>	1.0	PPI				
fluometuron <i>fb</i>	1.2	PRE				
pyrithiobac +	0.063					
AG-98 <i>fb</i>	0.25%	EOT				
pendimethalin +	1.0					
MSMA	1.5	DIR	10	13	30	26
Glyphosate <i>fb</i>	1.0	EOT				
glyphosate	1.0	DIR	0	3	4	0
Glyphosate <i>fb</i>	1.0	EOT				
pendimethalin +	1.0					
glyphosate	1.0	DIR	0	0	40	41
LSD (0.05)			6	4	8	11

<sup>z</sup>Rate in vol/vol.





Table 17.

Herbicide	Rate (lb/A)	Application timing	Cotton injury					Seedcotton yield
			6/21	6/28	7/6	7/14	7/21	10/12 (lb/A)
			----- (%) -----					
Untreated check			0	0	0	0	0	2540
Glyphosate (Roundup Ultra)	0.75	4 LF-OT	0	0	0	0	0	2437
Glyphosate	0.75	6-LF-OT		0	0	0	0	1936
Glyphosate	0.75	9 LF-OT			0	0	0	2044
Glyphosate	0.75	11 LF-OT			0	0	0	1553
Glyphosate	0.75	12 LF-OT				0	0	2137
Glyphosate <i>fb</i>	0.75	4 LF-OT						
glyphosate	0.75	6 LF-OT	0	0	0	0	0	2034
Glyphosate <i>fb</i>	0.75	4 LF-OT						
glyphosate	0.75	9 LF-OT	0	0	0	0	0	1955
Glyphosate <i>fb</i>	0.75	4 LF-OT						
glyphosate	0.75	11 LF-OT	0	0	0	0	0	1508
Glyphosate <i>fb</i>	0.75	4 LF-OT						
glyphosate	0.75	6 LF-DIR	0	0	0	0	0	2515
Glyphosate <i>fb</i>	0.75	4 LF-OT						
glyphosate	0.75	9 LF-DIR	0	0	0	0	0	2402
Glyphosate <i>fb</i>	0.75	4 LF-OT						
glyphosate	0.75	12 LF-DIR	0	0	0	0	0	2358
LSD (0.05)			NS	NS	NS	NS	NS	NS

**Table 18. Fomesafen (Reflex) preemergence in cotton, Rohwer, 1999.**

**TEST INFORMATION**

Location .....	Rohwer	Crop / Cultivar .....	cotton / DP5415
Experimental Design / replications .....	RCB / 4	Seeding rate .....	12 lb/A
Plot size .....	12.7 ft x 35 ft	Planting date / Harvest date .....	May 21, 1999 / N/A
Row width / Number of rows per plot .....	38" / 4	Soil type .....	silt loam (16% sand, 67% silt, 17% clay)
		% OM .....	2.2

Comments: PPI = preplant incorporated; and PRE = preemergence.

	PPI	PRE
Application type	PPI	PRE
Date applied	May 13, 1999	May 14, 1999
Time	11:00 am	6:30 am
Incorporation equipment	Triple K	N/A
Air/soil temperature (F)	80 / 74	77 / 75
Wind (mph)	5	3
Cloud cover (%)	0	0
Soil moisture	optimal	optimal
Crop stage	N/A	N/A
Sprayer type/mph	Triple K	BkPkCO <sub>2</sub> / 3
Nozzle type/Size	Flood	Flat Fan
Boom ht / # Noz / Spacing (in.)	22 / 1 / 38	22 / 8 / 19
Gpa / Psi	10 / 18	15 / 22
<b>Weed species</b> (density)	----- (no. of leaves) -----	
ECHCG (lt.)	N/A	N/A
BRAPP (lt.)	N/A	N/A
IPOLA (lt.)	N/A	N/A
SIDSP (lt.)	N/A	N/A
POROL (lt.)	N/A	N/A
SEBEX (lt.)	N/A	N/A

Conclusions: Fomesafen added to fluometuron PRE following trifluralin PPI was equal or superior to trifluralin followed by fluometuron alone for control of barnyardgrass, pitted morningglory, prickly sida, large crabgrass, and hemp sesbania. No clear response was noted when the rate of fomesafen combined with fluometuron was increased from 0.25 to 0.38 or 0.5 lb/A. When fomesafen was added to pyrithiobac PRE following trifluralin PPI, morningglory control was improved, but remained at lower than grower acceptable levels. A rate response was noted on morningglory control, but not on prickly sida and broadleaf signalgrass.

Table 18. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Barnyardgrass (ECHCG)		Broadleaf signalgrass (BRAPP)		Pitted morningglory (IPOLA)	
			6/25	7/26	6/25	7/26	6/25	7/26
Untreated check			0	0	0	0	0	0
Trifluralin (Treflan) <i>fb</i>	0.75	PPI						
fluometuron (Cotoran 4)	1.5	PRE	84	86	78	92	71	71
Trifluralin <i>fb</i>	0.75	PPI						
fomesafen (Reflex) + fluometuron	0.25 1.5	PRE	85	95	89	97	68	79
Trifluralin <i>fb</i>	0.75	PPI						
fomesafen + fluometuron	0.375 1.5	PRE	84	91	70	73	78	74
Trifluralin <i>fb</i>	0.75	PPI						
fomesafen + fluometuron	0.5 1.5	PRE	94	96	91	91	71	53
Trifluralin <i>fb</i>	0.75	PPI						
pyrithiobac (Staple)	0.047	PRE	43	11	56	28	54	0
Trifluralin <i>fb</i>	0.75	PPI						
fomesafen + pyrithiobac	0.25 0.047	PRE	64	45	56	58	61	31
Trifluralin <i>fb</i>	0.75	PPI						
fomesafen + pyrithiobac	0.375 0.047	PRE	61	31	48	43	69	53
Trifluralin <i>fb</i>	0.75	PPI						
fomesafen + pyrithiobac	0.5 0.047	PRE	69	58	50	53	66	60
Trifluralin <i>fb</i>	0.75	PPI						
fomesafen	0.375	PRE	56	66	48	43	44	35
Trifluralin	0.75	PPI	28	8	25	0	5	10
Trifluralin + fomesafen	0.75 0.25	PPI	50	38	43	46	26	13
Trifluralin + fomesafen	0.75 0.375	PPI	71	51	40	28	56	40
Trifluralin + fomesafen	0.75 0.5	PPI	69	56	61	53	54	44
Trifluralin <i>fb</i>	0.75	PPI						
fomesafen	0.25	PRE	53	44	45	40	45	0
Trifluralin <i>fb</i>	0.75	PPI						
fomesafen	0.375	PRE	45	50	50	44	25	0

continued

**Table 18. Section 1. Continued.**

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Barnyardgrass (ECHCG)		Broadleaf signalgrass (BRAPP)		Pitted morningglory (IPOLA)	
			6/25	7/26	6/25	7/26	6/25	7/26
			----- (%) -----					
Trifluralin <i>fb</i> fomesafen	0.75 0.5	PPI PRE	68	75	60	88	39	20
Trifluralin <i>fb</i> prometryn (Caparol FL)	0.75 0.8	PPI PRE	45	13	33	46	18	0
Trifluralin <i>fb</i> prometryn + fluometuron	0.75 0.8 1.0	PPI PRE	59	73	70	79	64	51
LSD (0.05)			20	29	19	36	30	41

**continued**

Table 18. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control			
			Prickly sida (SIDSP)		Common purslane (POROL)	Hemp sesbania (SEBEX)
			6/25	7/26	6/25	6/25
----- (%) -----						
Untreated check			0	0	0	0
Trifluralin (Treflan) <i>fb</i>	0.75	PPI				
fluometuron (Cotoran 4)	1.5	PRE	93	99	94	88
Trifluralin <i>fb</i>	0.75	PPI				
fomesafen (Reflex) + fluometuron	0.25 1.5	PRE	98	99	95	88
Trifluralin <i>fb</i>	0.75	PPI				
fomesafen + fluometuron	0.375 1.5	PRE	97	98	100	100
Trifluralin <i>fb</i>	0.75	PPI				
fomesafen + fluometuron	0.5 1.5	PRE	94	98	100	80
Trifluralin <i>fb</i>	0.75	PPI				
pyrithiobac (Staple)	0.047	PRE	99	96	63	68
Trifluralin <i>fb</i>	0.75	PPI				
fomesafen + pyrithiobac	0.25 0.047	PRE	89	91	84	88
Trifluralin <i>fb</i>	0.75	PPI				
fomesafen + pyrithiobac	0.375 0.047	PRE	90	83	94	95
Trifluralin <i>fb</i>	0.75	PPI				
fomesafen + pyrithiobac	0.5 0.047	PRE	98	100	93	100
Trifluralin <i>fb</i>	0.75	PPI				
fomesafen	0.375	PRE	51	31	74	75
Trifluralin	0.75	PPI	5	15	0	25
Trifluralin + fomesafen	0.75 0.25	PPI	33	20	68	73
Trifluralin + fomesafen	0.75 0.375	PPI	45	43	58	70
Trifluralin + fomesafen	0.75 0.5	PPI	55	68	70	75

continued

Table 18. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control			
			Prickly sida (SIDSP)		Common purslane (POROL)	Hemp sesbania (SEBEX)
			6/25	7/26	6/25	6/25
			----- (%) -----			
Trifluralin <i>fb</i>	0.75	PPI				
fomesafen	0.25	PRE	20	0	46	43
Trifluralin <i>fb</i>	0.75	PPI				
fomesafen	0.375	PRE	23	0	48	50
Trifluralin <i>fb</i>	0.75	PPI				
fomesafen	0.5	PRE	38	39	76	39
Trifluralin <i>fb</i>	0.75	PPI				
prometryn (Caparol FL)	0.8	PRE	45	13	45	75
Trifluralin <i>fb</i>	0.75	PPI				
prometryn +	0.8					
fluometuron	1.0	PRE	91	96	98	70
LSD (0.05)			26	28	32	51

Table 19. Fomesafen (Reflex) preemergence in cotton, Fayetteville, 1999.

## TEST INFORMATION

Location .....	Fayetteville	Crop / Cultivar .....	cotton / Paymaster 1220 BR
Experimental Design / replications .....	RCB / 4	Seeding rate .....	4 / ft
Plot size .....	3.3 ft x 27 ft	Planting date / Harvest date .....	June 3, 1999 / N/A
Row width / Number of rows per plot .....	40" / 1	Soil type .....	Taloka silt loam (27% sand, 64% silt, 9% clay)
		% OM .....	1.2

Comments: PPI = preplant incorporated; and PRE = preemergence.

Application type	PPI	PRE
Date applied	June 3, 1999	June 4, 1999
Time	11:00 am	6:00 am
Incorporation equipment	Lilliston	N/A
Air/soil temperature (F)	85 / 80	74 / 72
Wind (mph)	3	4
Cloud cover (%)	40	20
Soil moisture	moist	moist
Crop stage	N/A	N/A
Sprayer type/mph	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3
Nozzle type/Size	Flat fan / XR8002VS	Flat Fan / XR8002VS
Boom ht / # Noz / Spacing (in.)	19 / 2 / 18	19 / 2 / 18
Gpa / Psi	15 / 25	15 / 25
Weed species (density)	----- (no. of leaves) -----	
DIGSA (32/m <sup>2</sup> )	N/A	N/A
AMACH (40/m <sup>2</sup> )	N/A	N/A
AMAPA (1/m <sup>2</sup> )	N/A	N/A
IPOLA (32/m <sup>2</sup> )	N/A	N/A
IPOHG (4/m <sup>2</sup> )	N/A	N/A
SIDSP (36/m <sup>2</sup> )	N/A	N/A
ABUTH (32/m <sup>2</sup> )	N/A	N/A

Conclusions: The addition of fomesafen to trifluralin, either as a PPI tank mixture or a PRE overlay, increased control of all species over control with trifluralin alone. Control of morningglory species with the trifluralin/fomesafen combinations was generally equal to trifluralin/pyrithiobac mixtures. Treatments containing fluometuron generally controlled weeds better than treatments without fluometuron. Visual observations late in the season suggested that fomesafen may have controlled yellow nutsedge better than trifluralin and fluometuron, although the nutsedge population was considered too low to make accurate ratings. Cotton was slightly stunted (6 to 16%) at 2 weeks after planting by all treatments except trifluralin alone, but by 4 weeks after planting there were no differences among treatments.



**Table 19. Section 1.**

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Large crabgrass (DIGSA)		Smooth pigweed (AMACH)		Pitted morningglory (IPOLA)	
			6/17	7/2	6/17	7/2	6/17	7/2
----- (%) -----								
Untreated check			0	0	0	0	0	0
Trifluralin (Treflan) <i>fb</i>	0.75	PPI						
fluometuron (Cotoran)	1.2	PRE	100	100	100	100	99	99
Trifluralin <i>fb</i>	0.75	PPI						
fomesafen (Reflex) +	0.25							
fluometuron	1.2	PRE	100	100	100	100	99	98
Trifluralin <i>fb</i>	0.75	PPI						
fomesafen +	0.375							
fluometuron	1.2	PRE	100	100	100	100	96	99
Trifluralin <i>fb</i>	0.75	PPI						
fomesafen +	0.5							
fluometuron	1.2	PRE	100	100	100	100	99	99
Trifluralin <i>fb</i>	0.75	PPI						
pyrithiobac (Staple)	0.047	PRE	100	100	100	100	80	91
Trifluralin <i>fb</i>	0.75	PPI						
fomesafen +	0.25							
pyrithiobac	0.047	PRE	100	100	100	100	88	90
Trifluralin <i>fb</i>	0.75	PPI						
fomesafen +	0.375							
pyrithiobac	0.047	PRE	100	100	100	100	86	91
Trifluralin <i>fb</i>	0.75	PPI						
fomesafen +	0.5							
pyrithiobac	0.047	PRE	100	100	100	100	94	93
Trifluralin	0.75	PPI	99	98	96	80	43	40
Trifluralin +	0.75							
fomesafen	0.25	PPI	100	100	100	100	74	68
Trifluralin +	0.75							
fomesafen	0.375	PPI	100	100	100	100	79	75
Trifluralin +	0.75							
fomesafen	0.5	PPI	100	100	100	100	80	78
Trifluralin <i>fb</i>	0.75	PPI						
fomesafen	0.25	PRE	100	100	100	100	75	65
Trifluralin <i>fb</i>	0.75	PPI						
fomesafen	0.375	PRE	100	100	100	100	82	79
Trifluralin <i>fb</i>	0.75	PPI						
fomesafen	0.5	PRE	100	100	100	100	83	68
LSD (0.05)			1	1	1	6	12	10

continued

Table 19. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Entireleaf morningglory (IPOHG)		Velvetleaf (ABUTH)		Prickly sida (SIDSP)		Cotton injury	
			6/17	7/2	6/17	7/2	6/17	7/2	6/17	7/2
Untreated check			0	0	0	0	0	0	0	0
Trifluralin (Treflan) <i>fb</i>	0.75	PPI								
fluometuron (Cotoran)	1.2	PRE	100	100	99	100	100	99	6	1
Trifluralin <i>fb</i>	0.75	PPI								
fomesafen (Reflex) +	0.25									
fluometuron	1.2	PRE	99	100	97	97	98	99	11	1
Trifluralin <i>fb</i>	0.75	PPI								
fomesafen +	0.375									
fluometuron	1.2	PRE	97	99	96	97	100	99	11	4
Trifluralin <i>fb</i>	0.75	PPI								
fomesafen +	0.5									
fluometuron	1.2	PRE	99	100	94	97	100	100	8	3
Trifluralin <i>fb</i>	0.75	PPI								
pyrithiobac (Staple)	0.047	PRE	80	94	73	86	100	100	9	6
Trifluralin <i>fb</i>	0.75	PPI								
fomesafen +	0.25									
pyrithiobac	0.047	PRE	88	92	74	91	100	100	14	5
Trifluralin <i>fb</i>	0.75	PPI								
fomesafen +	0.375									
pyrithiobac	0.047	PRE	87	95	81	93	100	100	11	6
Trifluralin <i>fb</i>	0.75	PPI								
fomesafen +	0.5									
pyrithiobac	0.047	PRE	94	98	84	97	100	100	16	5

continued

Table 19. Section 2. Continued

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Entireleaf morningglory (IPOHG)		Velvetleaf (ABUTH)		Prickly sida (SIDSP)		Cotton injury	
			6/17	7/2	6/17	7/2	6/17	7/2	6/17	7/2
			----- (%) -----							
Trifluralin	0.75	PPI	43	40	43	38	43	33	3	0
Trifluralin + fomesafen	0.75 0.25	PPI	74	68	68	65	100	90	10	1
Trifluralin + fomesafen	0.75 0.375	PPI	79	75	69	58	95	95	10	1
Trifluralin + fomesafen	0.75 0.5	PPI	79	80	66	63	100	95	11	1
Trifluralin <i>fb</i> fomesafen	0.75 0.25	PPI PRE	75	68	58	54	98	94	9	0
Trifluralin <i>fb</i> fomesafen	0.75 0.375	PPI PRE	82	79	69	66	100	86	10	0
Trifluralin <i>fb</i> fomesafen	0.75 0.5	PPI PRE	81	69	64	58	99	98	11	3
LSD (0.05)			12	10	11	12	4	6	5	NS

Table 20. Soil-applied and postemergence herbicides in Roundup Ready cotton, Rohwer, 1999.

## TEST INFORMATION

Location .....	Rohwer	Crop / Cultivar .....	cotton / DP 5415RR
Experimental Design / replications .....	RCB / 4	Seeding rate .....	12 lb/A
Plot size .....	12.7 ft x 35 ft	Planting date / Harvest date ...	May 26, 1999 / Oct. 12, 1999
Row width / Number of rows per plot .....	38" / 4	Soil type .....	silt loam (16% sand, 67% silt, 17% clay)
		% OM .....	2.2

Comments: PPI = preplant incorporated; PRE = preemergence; and EOT = early over-the-top (2- to 4-lf cotton).

Application type	PPI	PRE	EOT
Date applied	May 19, 1999	May 20, 1999	June 11, 1999
Time	2:00 pm	7:00 pm	10:30 am
Incorporation equipment	Triple K	N/A	N/A
Air/soil temperature (F)	69 / 62	78 / 59	85 / 80
Wind (mph)	7	4	3
Cloud cover (%)	0	0	N/A
Soil moisture	optimal	optimal	dry
Crop stage	N/A	N/A	2-4 lf / 9"
Sprayer type/mph	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3	Tractor-CO <sub>2</sub> / 3
Nozzle type/Size	Flat fan / 11003	Flat Fan / 11003	Flat fan / 8002
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19	22 / 8 / 19
Gpa / Psi	15 / 22	15 / 22	11 / 25
<b>Weed species</b> (density)	----- (no. of leaves) -----		
IPOLA (mod.)	N/A	N/A	3-5 lf
AMARE (lt.)	N/A	N/A	2-4 lf
SIDSP (lt.)	N/A	N/A	2-4 lf
BRAPP (mod.)	N/A	N/A	3-5 lf
ECHCG (mod.)	N/A	N/A	2-4 lf
DIGSA (lt.)	N/A	N/A	2-4 lf

Conclusions: The single application of pendimethalin *fb* glyphosate at the two- to four-leaf stage of cotton provided significantly less control of pitted morningglory than treatments that included a soil-applied residual herbicide. Pendimethalin *fb* glyphosate and pendimethalin *fb* fluometuron provided less pitted morningglory control than pendimethalin *fb* fluometuron *fb* glyphosate and fluometuron *fb* glyphosate. No differences in control of other species were noted among any treatments.

**Table 20. Section 1.**

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Broadleaf signalgrass (BRAPP)		Barnyardgrass (ECHCG)		Large crabgrass (DIGSA)	
			6/11	6/21	6/11	6/21	6/11	6/21
Untreated check			0	0	0	0	0	0
Pendimethalin (Prowl) <i>fb</i>	1.0	PPI						
glyphosate (Roundup Ultra)	1.0	EOT	89	100	91	100	92	100
Pendimethalin <i>fb</i>	1.0	PPI						
fluometuron (Cotoran) <i>fb</i>	1.0	PRE						
glyphosate	1.0	EOT	98	100	99	100	98	100
Fluometuron <i>fb</i>	1.5	PRE						
glyphosate	1.0	EOT	99	100	99	100	91	100
Glyphosate	1.0	EOT	0	100	0	100	0	100
Trifluralin (Treflan) <i>fb</i>	1.0	PPI						
fluometuron <i>fb</i>	1.0	PRE						
glyphosate	1.0	EOT	100	100	98	100	97	100
Metolachlor (Dual II) +	1.5							
fluometuron <i>fb</i>	1.0	PRE						
metolachlor	1.0	EOT	99	100	98	100	98	100
Fluometuron <i>fb</i>	1.5	PRE						
glyphosate +	1.0							
metolachlor	1.5	EOT	95	100	94	100	94	100
Fluometuron <i>fb</i>	1.0	PRE						
glyphosate	1.0	EOT	95	100	93	100	91	100
Pendimethalin <i>fb</i>	1.0	PPI						
fluometuron	1.0	PRE	91	93	98	95	99	98
Pendimethalin <i>fb</i>	1.0	PPI						
fluometuron <i>fb</i>	1.0	PRE						
glyphosate	1.0	EOT	95	100	94	100	91	100
LSD (0.05)			11	7	6	3	13	4

continued

Table 20. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control						Seedcotton yield 10/12 (lb/A)
			Pitted morningglory (IPOLA)		Redroot pigweed (AMARE)		Prickly sida (SIDSP)		
			6/11	6/21	6/11	6/21	6/11	6/21	
Untreated check			0	0	0	0	0	0	526
Pendimethalin (Prowl) <i>fb</i>	1.0	PPI							
glyphosate (Roundup Ultra)	1.0	EOT	48	75	85	100	70	100	2878
Pendimethalin <i>fb</i>	1.0	PPI							
fluometuron (Cotoran) <i>fb</i>	1.0	PRE							
glyphosate	1.0	EOT	89	98	100	100	91	100	2392
Fluometuron <i>fb</i>	1.5	PRE							
glyphosate	1.0	EOT	84	99	100	100	95	100	2556
Glyphosate	1.0	EOT	0	50	0	100	0	100	2611
Trifluralin (Treflan) <i>fb</i>	1.0	PPI							
fluometuron <i>fb</i>	1.0	PRE							
glyphosate	1.0	EOT	77	99	100	100	91	100	2733
Metolachlor (Dual II) +	1.5								
fluometuron <i>fb</i>	1.0	PRE							
metolachlor	1.0	EOT	84	98	100	100	93	99	2939
Fluometuron <i>fb</i>	1.5	PRE							
glyphosate +	1.0								
metolachlor	1.5	EOT	82	98	100	78	89	100	2578
Fluometuron <i>fb</i>	1.0	PRE							
glyphosate	1.0	EOT	86	100	100	100	93	100	2771
Pendimethalin <i>fb</i>	1.0	PPI							
fluometuron	1.0	PRE	78	69	100	100	93	69	2354
Pendimethalin <i>fb</i>	1.0	PPI							
fluometuron <i>fb</i>	1.0	PRE							
glyphosate	1.0	EOT	90	97	100	100	92	100	2971
LSD (0.05)			23	19	12	15	15	13	608

**Table 21. Evaluation of postemergence herbicides, Rohwer, 1999.**

**TEST INFORMATION**

Location .....	Rohwer	Crop / Cultivar .....	cotton / DP 5415RR
Experimental Design / replications .....	RCB / 4	Seeding rate .....	12 lb/A
Plot size .....	12.7 ft x 35 ft	Planting date / Harvest date .....	May 28, 1999 / N/A
Row width / Number of rows per plot .....	38" / 4	Soil type .....	silt loam (16% sand, 67% silt, 17% clay)
		% OM .....	2.2

Comments: PPI = preplant incorporated; PRE = preemergence; EOT = early over-the-top; and LAYBY = post-directed at layby. Weed populations were not dense enough to evaluate layby treatments.

Application type	PPI	PRE	EOT	LAYBY
Date applied	May 19, 1999	May 20, 1999	June 11, 1999	July 7, 1999
Time	2:00 pm	7:00 pm	7:45 am	12:30 pm
Incorporation equipment	Triple K	N/A	N/A	N/A
Air/soil temperature (F)	78 / 68	78 / 68	69 / 85	94 / 80
Wind (mph)	8	3	4	5
Cloud cover (%)	0	0	0	0
Soil moisture	optimal	optimal	optimal	optimal
Crop stage	N/A	N/A	2-4 lf / 9"	10-12 lf / 30"
Sprayer type/mph	Leveland / 5	BkPkCO <sub>2</sub> / 3	Tractor-CO <sub>2</sub> / 3	4-row layby
Nozzle type/Size	Flood / 50	Flat Fan / 11003	Flat fan / 8002	Flat fan / 8002
Boom ht / # Noz / Spacing (in.)	22 / 4 / 38	22 / 8 / 19	22 / 8 / 19	4 / 4 / 38
Gpa / Psi	10 / 18	15 / 22	11 / 25	11 / 24
<b>Weed species</b> (density)	----- (no. of leaves) -----			
ECHCG (mod.)	N/A	N/A	2-4 lf	
IPOLA (lt.)	N/A	N/A	2-4 lf	
SIDSP (lt.)	N/A	N/A	3 lf	
EPHHT (lt.)	N/A	N/A	2-4 lf	

Conclusions: Applications of pyriithiobac applied PRE were extremely effective and weed densities were too low to adequately rate layby applications.

Table 21.

Herbicide	Rate (lb/A)	Application timing	Weed control			
			Barnyardgrass (ECHCG)	Pitted morningglory (IPOLA)	Prickly sida (SIDSP)	Prostrate spurge (EPHHT)
			7/7	7/7	7/7	7/7
----- (%) -----						
Pendimethalin (Prowl) <i>fb</i>	1.0	PPI				
fluometuron (Cotoran)	1.0	PRE	0	0	0	0
Pendimethalin <i>fb</i>	1.0	PPI				
fluometuron <i>fb</i>	1.0	PRE				
pyrithiobac (Staple) <i>fb</i>	0.053	EOT				
pendimethalin	1.0	LAYBY	15	69	100	94
Pendimethalin <i>fb</i>	1.0	PPI				
fluometuron <i>fb</i>	1.0	PRE				
pyrithiobac <i>fb</i>	0.053	EOT				
dimethipin (Harvade) + MSMA +	0.23 2.0					
Agri-Dex	0.25%	LAYBY	5	74	100	89
Pendimethalin <i>fb</i>	1.0	PPI				
fluometuron <i>fb</i>	1.0	PRE				
pyrithiobac <i>fb</i>	0.053	EOT				
pendimethalin + MSMA	1.0 2.0	LAYBY	8	65	100	83
Pendimethalin <i>fb</i>	1.0	PPI				
fluometuron <i>fb</i>	1.0	PRE				
pyrithiobac <i>fb</i>	0.053	EOT				
pendimethalin + glyphosate (Roundup Ultra)	1.0 0.5	LAYBY	10	76	100	90
Pendimethalin <i>fb</i>	1.0	PPI				
fluometuron <i>fb</i>	1.0	PRE				
pyrithiobac <i>fb</i>	0.053	EOT				
MSMA + cyanazine (Bladex)	2.0 0.75	LAYBY	13	55	100	90
Pendimethalin <i>fb</i>	1.0	PPI				
fluometuron <i>fb</i>	1.0	PRE				
pyrithiobac <i>fb</i>	0.053	EOT				
fomesafen (Reflex) + MSMA	0.38 2.0	LAYBY	46	73	100	90
Pendimethalin <i>fb</i>	1.0	PPI				
fluometuron <i>fb</i>	1.0	PRE				
pyrithiobac <i>fb</i>	0.053	EOT				
lactofen (Cobra) + MSMA	0.2 2.0	LAYBY	30	80	100	91

continued



Table 21. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control			
			Barnyardgrass (ECHCG) 7/7	Pitted morningglory (IPOLA) 7/7	Prickly sida (SIDSP) 7/7	Prostrate spurge (EPHHT) 7/7
			----- (%) -----			
Pendimethalin <i>fb</i>	1.0	PPI				
fluometuron <i>fb</i>	1.0	PRE				
pyrithiobac <i>fb</i>	0.053	EOT				
fluometuron + MSMA	1.0 2.0	LAYBY	13	65	100	84
Pendimethalin <i>fb</i>	1.0	PPI				
fluometuron <i>fb</i>	1.0	PRE				
pyrithiobac <i>fb</i>	0.053	EOT				
oxyfluorfen (Goal XL) + MSMA	0.25 2.0	LAYBY	28	73	100	85
Pendimethalin <i>fb</i>	1.0	PPI				
fluometuron <i>fb</i>	1.0	PRE				
pyrithiobac <i>fb</i>	0.053	EOT				
[acifluorfen + bentazon (Storm)] + MSMA	0.75 2.0	LAYBY	30	74	100	81
Pendimethalin <i>fb</i>	1.0	PPI				
fluometuron <i>fb</i>	1.0	PRE				
pyrithiobac <i>fb</i>	0.053	EOT				
glyphosate	0.5	LAYBY	13	51	98	79
Pendimethalin <i>fb</i>	1.0	PPI				
fluometuron <i>fb</i>	1.0	PRE				
pyrithiobac <i>fb</i>	0.053	EOT				
dimethipin + glyphosate + Agri-Dex	0.23 0.5 0.25% <sup>z</sup>	LAYBY	48	65	100	73
LSD (0.05)			NS	26	1	13

<sup>z</sup> Rate in vol/vol.

Table 22. Flumioxazin (Valor) post-directed at layby in cotton, Fayetteville, 1999.

## TEST INFORMATION

Location .....	Fayetteville	Crop / Cultivar .....	cotton / Paymaster 1220BR
Experimental Design / replications .....	RCB / 4	Seeding rate .....	4 / ft
Plot size .....	3.3 ft x 27 ft	Planting date / Harvest date .....	June 3, 1999 / N/A
Row width / Number of rows per plot .....	40" / 1	Soil type .....	Taloka silt loam (27% sand, 64% silt, 9% clay)
		% OM .....	1.2

Comments: PPI = preplant incorporated; EDIR = early post-directed; LDIR = late post-directed; and LAYBY = post-directed at layby. Standard PPI/EDIR treatment was trifluralin, 0.75 + fluometuron, 1.25 lb ai/A, PPI *fb* fluometuron, 0.8 + MSMA, 1.5 lb/A, EDIR applied over all plots. Cotton stems had at least 4 inches of bark at layby.

Application type	PPI	EDIR	LDIR	LAYBY
Date applied	June 3, 1999	June 21, 1999	July 8, 1999	July 29, 1999
Time	11:00 am	8:00 am	10:00 am	7:00 am
Incorporation equipment	Lilliston	N/A	N/A	N/A
Air/Soil temperature (F)	85 / 80	77 / 76	87 / 88	78 / 80
Wind (mph)	3	2	2	1
Cloud cover (%)	40	30	25	0
Soil moisture	moist	very wet	moist	moist
Crop stage/Height	N/A	1-2 lf / 4"	6 lf / 10"	many lvs / 22"
Sprayer type/mph	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3	Tractor CO <sub>2</sub> / 3
Nozzle type/Size	Flat fan / 8001VS	Flat fan / OC-01	Flat fan / OC-01	Flat fan / OC-01
Boom ht / # Noz / Spacing (in.)	20 / 2 / 19	3 / 2 / 18	6 / 2 / 18	9 / 2 / 28
Gpa / Psi	20 / 41	15 / 22	15 / 22	15 / 33
<b>Weed species</b> (density at EDIR)-----				
				(no. of leaves)-----
DIGSA (controlled)	N/A	N/A	N/A	N/A
AMACH (1/m <sup>2</sup> )	N/A	2-6 lf / 1-4 cm	N/A	many lvs / 12-20"
IPOLA (4/m <sup>2</sup> )	N/A	cot. - 3 lf / 2-3 cm	5 lf / 2"	5 lf vine /
IPOHG (4/m <sup>2</sup> )	N/A	1-3 lf / 3-6 cm	5 lf / 2"	N/A
SIDSP (<1/plot)	N/A	N/A	3 lf / 1"	N/A
ABUTH (3/m <sup>2</sup> )	N/A	2-4 lf / 2-3 cm	5-7 lf / 3-5"	many lvs / 20-24"

Conclusions: Control with standard PPI *fb* DIR overlay was so good that the weed population was still quite low at layby. However, flumioxazin had good contact activity and controlled most weeds present. Velvetleaf plants were large and good spray coverage was not possible, so velvetleaf control was lower than other weeds. Careful post-directing minimized cotton injury. Lower leaves that were contacted by spray were chlorotic and necrotic but no more than injury from standard herbicides lactofen or cyanazine plus MSMA. Cotton stems were darkened from flumioxazin contact. In summary, flumioxazin is promising as a layby treatment in cotton for its contact and residual activity.

Table 22. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Large crabgrass (DIGSA)		Smooth pigweed (AMACH)		Pitted morningglory (IPOLA)		Entireleaf morningglory (IPOHG)	
			8/5	8/16	8/5	8/16	8/5	8/16	8/5	8/16
Check (Std. PPI/EDIR)			97	100	90	90	97	98	95	91
Std. PPI/EDIR <i>fb</i>		PPI/EDIR								
flumioxazin (Valor) + Prime Oil	0.063 1 qt/A	LAYBY	100	100	100	100	100	100	100	100
Std. PPI/EDIR <i>fb</i>		PPI/EDIR								
flumioxazin + Prime Oil	0.094 1 qt/A	LAYBY	100	100	100	100	100	100	100	99
Std. PPI/EDIR <i>fb</i>		PPI/EDIR								
flumioxazin + MSMA + Prime Oil	0.063 2.0 1 qt/A	LAYBY	100	100	100	100	100	100	100	99
Std. PPI/EDIR <i>fb</i>		PPI/EDIR								
flumioxazin + MSMA + Prime Oil	0.094 2.0 1 qt/A	LAYBY	100	100	100	100	100	100	100	100
Std. PPI/EDIR <i>fb</i>		PPI/EDIR								
flumioxazin + glyphosate (Roundup Ultra)	0.063 1.0	LAYBY	100	100	98	99	100	100	100	99
Std. PPI/EDIR <i>fb</i>		PPI/EDIR								
flumioxazin + glyphosate	0.094 1.0	LAYBY	100	100	99	96	100	100	100	100
Std. PPI/EDIR <i>fb</i>		PPI/EDIR								
lactofen (Cobra) + MSMA + Prime Oil	0.2 2.0 1 qt/A	LAYBY	100	100	98	96	100	100	100	100
Std. PPI/EDIR <i>fb</i>		PPI/EDIR								
cyanazine (Bladex) + MSMA + Prime Oil	0.8 2.0 1 qt/A	LAYBY	100	100	100	100	100	100	100	100
Std. PPI/EDIR <i>fb</i>		PPI/EDIR								
flumioxazin + glyphosate	0.063 1.0	LDIR	100	100	100	100	100	100	100	100
LSD (0.05)			1	NS	4	4	1	NS	2	3

continued

Table 22. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control				Cotton injury	
			Prickly sida (SIDSP)		Velvetleaf (ABUTH)		8/5	8/16
			8/5	8/16	8/5	8/16	8/5	8/16
----- (%) -----								
Check (Std. PPI/EDIR)			100	100	78	73	0	0
Std. PPI/EDIR <i>fb</i>		PPI/EDIR						
flumioxazin (Valor) + Prime Oil	0.063 1 qt/A	LAYBY	100	100	93	94	10	0
Std. PPI/EDIR <i>fb</i>		PPI/EDIR						
flumioxazin + Prime Oil	0.094 1 qt/A	LAYBY	100	100	86	85	9	0
Std. PPI/EDIR <i>fb</i>		PPI/EDIR						
flumioxazin + MSMA + Prime Oil	0.063 2.0 1 qt/A	LAYBY	100	100	90	90	11	0
Std. PPI/EDIR <i>fb</i>		PPI/EDIR						
flumioxazin + MSMA + Prime Oil	0.094 2.0 1 qt/A	LAYBY	100	100	91	90	10	0
Std. PPI/EDIR <i>fb</i>		PPI/EDIR						
flumioxazin + glyphosate (Roundup Ultra)	0.063 1.0	LAYBY	100	100	85	84	10	0
Std. PPI/EDIR <i>fb</i>		PPI/EDIR						
flumioxazin + glyphosate	0.094 1.0	LAYBY	100	100	89	83	9	0
Std. PPI/EDIR <i>fb</i>		PPI/EDIR						
lactofen + MSMA + Prime Oil	0.2 2.0 1 qt/A	LAYBY	100	100	86	83	13	0
Std. PPI/EDIR <i>fb</i>		PPI/EDIR						
cyanazine (Bladex) + MSMA + Prime Oil	0.8 2.0 1 qt/A	LAYBY	100	100	89	90	13	0
Std. PPI/EDIR <i>fb</i>		PPI/EDIR						
flumioxazin + glyphosate	0.063 1.0	LDIR	100	100	95	98	3	0
LSD (0.05)			NS	NS	7	12	3	NS

**Table 23. Flumioxazin (Valor) post-directed at layby in cotton, Marianna, 1999.**

**TEST INFORMATION**

Location .....	Marianna	Crop / Cultivar .....	cotton / Paymaster 1220BR
Experimental Design / replications .....	RCB / 4	Seeding rate .....	12 lb/A
Plot size .....	12.7 ft x 35 ft	Planting date / Harvest date .....	May 18, 1999 / N/A
Row width / Number of rows per plot .....	38" / 4	Soil type ...	Calloway silt loam (2% sand, 86% silt, 12% clay)
		% OM .....	1.0

Comments: PPI = preplant incorporated; PRE = preemergence; and LAYBY = post-directed at layby.

Application type	PPI	PRE	LAYBY
Date applied	May 19, 1999	May 19, 1999	July 12, 1999
Time	9:00 am	11:30 am	5:00 pm
Incorporation equipment	Triple K	N/A	N/A
Wind (mph)	3	3	3
Cloud cover (%)	0	0	30
Soil moisture	medium	medium	adequate
Sprayer type/mph	Tractor CO <sub>2</sub> / 3	Tractor CO <sub>2</sub> / 3	Tractor CO <sub>2</sub> / 3
Nozzle type/Size	8003 VS	8003 VS	Flood Jet
Boom ht / # Noz / Spacing (in.)	20 / 8 / 19	20 / 8 / 19	- / 1 / 38
Gpa / Psi	20 / 28	20 / 28	20 / 23
<b>Weed species</b> (density)	----- (height in inches) -----		
SIDSP (4/sq ft)	N/A	N/A	1-16"
IPOLA (1/sq ft)	N/A	N/A	1-12"
AMACH (1/sq ft)	N/A	N/A	1-24"
CYPES	N/A	N/A	6-15"
Annual grasses (1/ft <sup>2</sup> )	N/A	N/A	5-12"

Conclusions: The low rate of flumioxazin was inadequate for control of IPOLA and yellow nutsedge. Control of prickly sida and annual grasses was increased by adding glyphosate or MSMA to flumioxazin. Except for the low rate alone, flumioxazin treatments controlled pitted morningglory 94 to 99%. Cotton injury for all layby treatments was minimal and consisted of leaf necrosis where contacted by spray. Flumioxazin is promising as a layby treatment in cotton.

Table 23. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Prickly sida (SIDSP)		Smooth pigweed (AMACH)		Pitted morningglory (IPOLA)	
			7/19	7/27	7/19	7/27	7/19	7/27
----- (%) -----								
STD. PPI/PRE [Trifluralin (Treflan) <i>fb</i> fluometuron (Cotoran)]	0.75	PPI						
	0.8	PRE	0	0	0	0	0	0
STD. PPI/PRE <i>fb</i> STD. EDIR [fluometuron + MSMA]	0.8							
	2.0	EDIR	0	0	0	0	0	0
STD. PPI/PRE/EDIR <i>fb</i> flumioxazin (Valor) + Agri-Dex	0.063							
	1 qt/A	LAYBY	84	81	94	89	86	87
STD. PPI/PRE/EDIR <i>fb</i> flumioxazin + Agri-Dex	0.094							
	1 qt/A	LAYBY	89	84	92	91	94	94
STD. PPI/PRE/EDIR <i>fb</i> flumioxazin + MSMA + Agri-Dex	0.063							
	2.0							
	1 qt/A	LAYBY	90	90	97	92	95	96
STD. PPI/PRE/EDIR <i>fb</i> flumioxazin + MSMA + Agri-Dex	0.094							
	2.0							
	1 qt/A	LAYBY	90	91	97	94	95	97
STD. PPI/PRE/EDIR <i>fb</i> flumioxazin + glyphosate (Roundup Ultra)	0.063							
	1.0	LAYBY	80	94	96	96	97	99
STD. PPI/PRE/EDIR <i>fb</i> flumioxazin + glyphosate	0.094							
	1.0	LAYBY	79	94	94	96	88	96
STD. PPI/PRE/EDIR <i>fb</i> cyanazine (Bladex) + MSMA + Agri-Dex	0.75							
	2.0							
	1 qt/A	LAYBY	80	86	68	67	83	96
LSD (0.05)			5	6	21	22	7	4

continued

**Table 23. Section 2.**

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Yellow nutsedge (CYPES)		Annual grasses <sup>z</sup>		Cotton injury	
			7/19	7/27	7/19	7/27	7/19	7/27
			----- (%) -----					
STD. PPI/PRE [Trifluralin (Treflan) fb fluometuron (Cotoran)]	0.75 0.8	PPI PRE	0	0	0	0	0	0
STD. PPI/PRE fb STD. EDIR [fluometuron + MSMA]	0.8 2.0	EDIR	0	0	0	0	0	0
STD. PPI/PRE/EDIR fb flumioxazin (Valor) + Agri-Dex	0.063 1 qt/A	LAYBY	66	66	76	80	15	9
STD. PPI/PRE/EDIR fb flumioxazin + Agri-Dex	0.094 1 qt/A	LAYBY	74	66	86	63	16	14
STD. PPI/PRE/EDIR fb flumioxazin + MSMA + Agri-Dex	0.063 2.0 1 qt/A	LAYBY	68	84	81	91	18	13
STD. PPI/PRE/EDIR fb flumioxazin + MSMA + Agri-Dex	0.094 2.0 1 qt/A	LAYBY	61	68	85	94	18	14
STD. PPI/PRE/EDIR fb flumioxazin + glyphosate (Roundup Ultra)	0.063 1.0	LAYBY	78	85	86	91	16	13
STD. PPI/PRE/EDIR fb flumioxazin + glyphosate	0.094 1.0	LAYBY	38	44	85	95	16	10
STD. PPI/PRE/EDIR fb cyanazine (Bladex) + MSMA + Agri-Dex	0.75 2.0 1 qt/A	LAYBY	66	80	84	91	11	11
LSD (0.05)			31	35	8	20	4	4

<sup>z</sup> Annual grasses included goosegrass, large crabgrass, and broadleaf signalgrass.

**Table 24. Clomazone (Command) applied postemergence, Rohwer, 1999.****TEST INFORMATION**

Location .....	Rohwer	Crop / Cultivar .....	cotton / DP 5415RR
Experimental Design / replications .....	RCB / 4	Seeding rate .....	12 lb/A
Plot size .....	12.7 ft x 35 ft	Planting date / Harvest date .....	May 28, 1999 / N/A
Row width / Number of rows per plot .....	38" / 4	Soil type .....	silt loam (16% sand, 67% silt, 17% clay)
		% OM .....	2.2

Comments: 3-4 LF-OT = over-the-top at 3-4 leaf cotton; 6-8 LF-DIR = post-directed at 6-8 leaf cotton; 8-10 LF-DIR = post-directed at 8-10 leaf cotton; and LAYBY = post-directed at layby.

Application type	3-4 LF-OT	6-8 LF-DIR	8-10 LF-DIR	LAYBY
Date applied	June 18, 1999	June 25, 1999	July 2, 1999	July 9, 1999
Time	10:30 am	9:00 am	1:00 pm	10:30 am
Incorporation equipment	N/A	N/A	N/A	N/A
Air/soil temperature (F)	78 / 74	85 / 70	90 / 72	92 / 80
Wind (mph)	7	4	7	5
Cloud cover (%)	0	100	30	
Soil moisture	dry	optimal	optimal	optimal
Crop stage/Height	2-6 lf / 10"	6-8 lf / 18"	8-10 lf / 24"	12th node / 30"
Sprayer type/mph	BkPkCO <sub>2</sub> /	BkPkCO <sub>2</sub> / 4.2	BkPkCO <sub>2</sub> / 4.2	Tractor CO <sub>2</sub> / 4.2
Nozzle type/Size	Flat fan / 11003	Flat fan / 8002VS	Flat fan / 8002 VS	Flat fan / 8002 VS
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	4 / 8 / 20	4 / 8 / 20	4 / 8 / 20
Gpa / Psi	15 / 25	15 / 24	15 / 24	15 / 26
<b>Weed species</b> (density)	----- (no. of leaves) -----			
ECHCG (mod.)	2-5 lf	2-8 lf	2-10 lf	2-12 lf
IPLA (hvy.)	2-4 lf	2-6 lf	2-8 lf	2-10 lf
SEBEX (hvy.)	2-6 lf	2-8 lf	2-10 lf	2-12 lf
SIDSP (hvy.)	2-6 lf	2-8 lf	2-10 lf	2-12 lf
AMARE (mod.)	2-4 lf	2-6 lf	2-8 lf	2-10 lf

Conclusions: This study was established to evaluate the effectiveness of clomazone as a soil residual herbicide when applied postemergence in combination with glyphosate. Barnyardgrass was effectively controlled with all application timings of clomazone and glyphosate, but hemp sesbania, morningglory, and prickly sida control appeared to be affected more by the number of glyphosate applications than by soil residual activity of clomazone.



Table 24.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Barnyardgrass (ECHCG)		Pitted morningglory (IPOLA)		Prickly sida (SIDSP)	Redroot pigweed (AMARE)	Hemp sesbania (SEBEX)
			7/7	7/21	7/7	7/21	7/21	7/21	7/21
			----- (%) -----						
Untreated check			0	0	0	0	0	0	0
Clomazone (Command) + glyphosate (Roundup Ultra)	0.5 0.75	3-4 LF-OT	98	84	26	35	44	99	89
Clomazone + glyphosate	0.75	3-4 LF-OT	98	96	18	40	80	100	81
Clomazone + glyphosate	1.0 0.75	3-4 LF-OT	96	92	28	44	61	98	100
Glyphosate <i>fb</i> clomazone + glyphosate	0.75 0.5	3-4 LF-OT 6-8 LF-DIR	98	97	48	69	86	100	95
Glyphosate <i>fb</i> clomazone + glyphosate	0.75 0.75	3-4 LF-OT 6-8 LF-DIR	98	97	25	60	77	94	79
Glyphosate <i>fb</i> clomazone + glyphosate	0.75 1.0	3-4 LF-OT 6-8 LF-DIR	98	98	25	50	52	88	85
Glyphosate <i>fb</i> glyphosate <i>fb</i> clomazone + glyphosate	0.75 0.75 0.75	3-4 LF-OT 6-8 LF-DIR 8-10 LF-DIR	94	81	30	68	66	88	88
Glyphosate <i>fb</i> glyphosate <i>fb</i> clomazone + glyphosate	0.75 0.75 0.75	3-4 LF-OT 6-8 LF-DIR 8-10 LF-DIR	98	93	29	66	79	99	96
Glyphosate <i>fb</i> glyphosate <i>fb</i> clomazone + glyphosate	0.75 0.75 1.0	3-4 LF-OT 6-8 LF-DIR 8-10 LF-DIR	98	96	46	78	96	96	80
Glyphosate <i>fb</i> glyphosate <i>fb</i> glyphosate <i>fb</i> clomazone + glyphosate	0.75 0.75 0.75 0.5	3-4 LF-OT 6-8 LF-DIR 8-10 LF-DIR LAYBY	97	98	61	94	97	100	79

continued

Table 24. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Barnyardgrass (ECHCG)		Pitted morningglory (IPOLA)		Prickly sida (SIDSP)	Redroot pigweed (AMARE)	Hemp sesbania (SEBEX)
			7/7	7/21	7/7	7/21	7/21	7/21	7/21
			----- (%) -----						
Glyphosate <i>fb</i>	0.75	3-4 LF-OT							
glyphosate <i>fb</i>	0.75	6-8 LF-DIR							
glyphosate <i>fb</i>	0.75	8-10 LF-DIR							
clomazone + glyphosate	0.75	LAYBY	97	98	46	87	96	100	82
Glyphosate <i>fb</i>	0.75	3-4 LF-OT							
glyphosate <i>fb</i>	0.75	6-8 LF-DIR							
glyphosate <i>fb</i>	0.75	8-10 LF-DIR							
clomazone + glyphosate	1.0								
glyphosate	0.75	LAYBY	95	98	61	94	99	100	88
LSD (0.05)			4	9	22	21	34	15	29

Table 25. Over-the-top grass herbicides, Rohwer, 1999.

TEST INFORMATION

Location .....	Rohwer	Crop / Cultivar .....	cotton / DP 5415
Experimental Design / replications .....	RCB / 4	Seeding rate .....	12 lb/A
Plot size .....	12.7 ft x 35 ft	Planting date / Harvest date .....	May 24, 1999 / N/A
Row width / Number of rows per plot .....	38" / 4	Soil type .....	silt loam (16% sand, 67% silt, 17% clay)
		% OM .....	2.2

Comments: PRE = preemergence and EOT = early over-the-top at 2- to 4-lf cotton.

Application type	PRE	EOT
Date applied	May 14, 1999	June 18, 1999
Time	7:00 am	8:00 am
Incorporation equipment	N/A	N/A
Air/soil temperature (F)	75 / 74	78 / 74
Relative humidity (%)	55	30
Wind (mph)	3	4
Cloud cover (%)	0	
Soil moisture	optimal	dry
Crop stage/Height	N/A	2-4 lf / 10"
Sprayer type/mph	BkPkCO <sub>2</sub> /	BkPkCO <sub>2</sub> /
Nozzle type/Size	Flat fan / 11003	Flat fan / 11003
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19
Gpa / Psi	15 / 22	15 / 25
<b>Weed species</b> (density)	----- (no. of leaves) -----	
ECHCG (mod.)	N/A	3-4 lf
BRAPP (mod.)	N/A	2-4 lf

Conclusions: The compound BAS-620 was compared to quizalofop, sethoxydim, fluazifop-P, and clethodim in tankmixes with pyriithiobac for control of barnyardgrass and broadleaf signalgrass. At 54 DAT, BAS-620 provided excellent control of barnyardgrass and was equal to clethodim and sethoxydim and superior to quizalofop and fluazifop-P. Control of broadleaf signalgrass was fair at 54 DAT, but less than that provided by clethodim, fluazifop-P, and sethoxydim. By 74 DAT, control of barnyardgrass with BAS-620 had dropped slightly and was greater than that provided by the other grass herbicides. At 74 DAT, broadleaf signalgrass control with BAS-620 was only fair and slightly less than that provided by clethodim, fluazifop-P, and sethoxydim.

Table 25.

Herbicide	Rate (lb/A)	Application timing	Weed control			
			Barnyardgrass (ECHCG)		Broadleaf signalgrass (BRAPP)	
			7/7	7/26	7/7	7/26
			----- (%) -----			
Untreated check						
pyrithiobac (Staple)	0.063	PRE	0	0	0	0
Pyrithiobac <i>fb</i>	0.063	PRE				
BAS 620 +	0.124					
Agri-Dex	1.25% <sup>z</sup>	EOT	95	88	71	73
Pyrithiobac <i>fb</i>	0.063	PRE				
quizalofop (Assure II) +	0.055					
Agri-Dex	1.25%	EOT	65	39	45	39
Pyrithiobac <i>fb</i>	0.063	PRE				
sethoxydim (Poast Plus) +	0.188					
Agri-Dex	1.25%	EOT	97	69	91	85
Pyrithiobac <i>fb</i>	0.063	PRE				
fluazifop-P (Fusilade DX) +	0.19					
Agri-Dex	1.25%	EOT	83	39	84	81
Pyrithiobac +	0.063	PRE				
clethodim (Select) +	0.125					
Agri-Dex	1.25%	EOT	97	79	97	88
LSD (0.05)			9	10	24	15

<sup>z</sup> Rate in vol/vol.

**Table 26. Herbicide drift rates on cotton, Rohwer, 1999.**

**TEST INFORMATION**

Location .....	Rohwer	Crop / Cultivar .....	cotton / DP 5415
Experimental Design / replications .....	split-block / 3	Planting date / Harvest date ....	May 11, 1999 / Oct. 13, 1999
Plot size .....	12.7 ft x 35 ft	Soil type .....	silt loam (16% sand, 67% silt, 17% clay)
Row width / Number of rows per plot .....	38" / 4	% OM .....	2

Comments: 3 LF = 3 leaf cotton and 6 LF = 6 leaf cotton.

	3 LF	6 LF
Application type	3 LF	6 LF
Date applied	June 10, 1999	June 18, 1999
Time	8:00 am	9:00 am
Incorporation equipment	N/A	N/A
Air/soil temperature (F)	87 / 85	78 / 72
Relative humidity (%)	70	55
Wind (mph)	6	3
Cloud cover (%)	0	
Soil moisture	dry	dry
Crop stage/Height	cotton - 3 lf / 6"; soybean - 2-4 lf / 6"	cotton - Pinhead square / 16"; soybean - 6 lf / 10"
Sprayer type/mph	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3
Nozzle type/Size	Flat fan / 11004	Flat fan / 11003
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	22 / 8 / 19
Gpa / Psi	15 / 24	15 / 25

Conclusions: Herbicide drift on young cotton can affect yields although symptomology disappears prior to harvest. Quinclorac (Facet) at 0.1 and 0.01 times (X) the normal use rates applied to 3- and 6-leaf cotton reduced yields. There was a rate response to quinclorac, 2,4-D, triclopyr (Grandstand), and glyphosate, with less yield reduction at the lower drift rates. Quinclorac and 2,4-D were most detrimental to cotton, whereas dicamba (Clarity) was most detrimental to soybeans. Additional data will be required to predict yield losses from drift symptomology.

**Table 26.**

Herbicide	Rate (lb/A)	Application timing	Seedcotton yield	Soybean yield
			10/13 (lb/A)	10/13 (bu/A)
Untreated check			2497	49.7
Quinclorac (Facet)	0.038	3 LF	2058	52.9
Quinclorac	0.0038	3 LF	2294	49.5
Quinclorac	0.0004	3 LF	2366	52.4
2,4-D (2,4-D amine)	0.01	3 LF	1633	47.7
2,4-D	0.005	3 LF	1962	46.9
2,4-D	0.001	3 LF	2146	50.5
Glyphosate (Roundup)	0.01	3 LF	2314	52.5
Glyphosate	0.005	3 LF	2469	47.0
Propanil (Stam)	0.04	3 LF	2316	50.1
Propanil	0.004	3 LF	2354	48.2
Triclopyr (Grandstand)	0.005	3 LF	2454	49.1
Triclopyr	0.001	3 LF	2118	49.6
Dicamba (Clarity)	0.005	3 LF	2399	50.9
Dicamba	0.001	3 LF	2405	51.3
Bentazon (Basagran)	0.005	3 LF	2536	47.0
Halosulfuron (Permit)	0.0006	3 LF	2316	47.1
Propanil + molinate (Arrosolo)	0.04	3 LF	2205	44.7
Untreated check		6 LF	2261	51.8
Quinclorac	0.038	6 LF	1967	55.3
Quinclorac	0.0038	6 LF	2036	52.7
Quinclorac	0.38	6 LF	1167	52.9
2,4-D	0.01	6 LF	1787	55.5
2,4-D	0.005	6 LF	2092	52.1
2,4-D	0.1	6 LF	178	51.0
Glyphosate	0.01	6 LF	1958	49.9
Glyphosate	0.1	6 LF	2051	53.6
Propanil	0.04	6 LF	2199	54.7
Propanil	0.4	6 LF	1771	49.5
Triclopyr	0.005	6 LF	2394	50.5
Triclopyr	0.01	6 LF	2399	55.0
Dicamba	0.005	6 LF	2256	27.8
Dicamba	0.01	6 LF	2225	40.8
Bentazon	0.05	6 LF	2170	53.2
Halosulfuron	0.05	6 LF	1794	38.6
Propanil + molinate	0.04	6 LF	2075	47.1
LSD (0.05)			375	9.2

**Table 27. Economics of cotton systems, Rohwer, 1999.**

**TEST INFORMATION**

Location .....	Rohwer	Crop / Cultivar .....	cotton / several
Experimental Design / replications .....	split-block / 3	Planting date / Harvest date .....	May 24, 1999 / N/A
Plot size .....	20 ft x 40 ft	Soil type .....	silt loam (16% sand, 67% silt, 17% clay)
Row width.....	38" (conventional)/ 7.5" UNR	% OM .....	2.2

Comments: PPI = preplant incorporated; PRE = preemergence; OT = over-the-top at 4-lf cotton; and DIR = directed at 4-lf cotton. NAWF = nodes above white flower. Each cultivar was evaluated under a conventional and ultra-narrow row (UNR) planting system. Cultivars were: DP5415RR (Roundup Ready), DP5415 (conventional), BXN47 (Buctril tolerant), and NuCot 33B (conventional).

Application type	PPI	PRE	OT	DIR
Date applied	May 24, 1999	May 24, 1999	June 16, 1999	June 16, 1999
Time	1:00 pm	1:00 pm	7:00 am	9:00 am
Incorporation equipment	Triple K	N/A	N/A	N/A
Air/soil temperature (F)	90 / 78	90 / 78	83 / 74	83 / 74
Relative humidity (%)	70	70	60	60
Wind (mph)	2	2	3	3
Cloud cover (%)	10	10	0	N/A
Soil moisture	optimal	optimal	dry	optimal
Sprayer type/mph	Triple K / 4.2	Hi-Boy / 4.2	Hi-Boy / 4.2	Tractor-CO <sub>2</sub> / 4
Nozzle type/Size	Flood / 5	Flat Fan / 8002	Flat fan / 8002	Flat fan / 8002
Boom ht / # Noz / Spacing (in.)	3 / 1 / 38	22 / 2 / 19	22 / 2 / 19	4 / 20 / 2
Gpa / Psi	10 / 30	10 / 28	10 / 30	10 / 25

Conclusions: The PPI application of pendimethalin controlled all grasses, but allowed some broadleaf escapes. Prickly sida, morningglory, and sicklepod populations were higher in the pendimethalin fb glyphosate conventional-till treatment than in the same herbicide program in ultra-narrow row cotton (UNRC). Prickly sida and morningglory populations were also higher in the conventional-till BXN and NuCot 33 treatments than in the same herbicide programs in the UNRC. There were no yield differences among herbicide programs within tillage systems, but yields from similar herbicide programs were higher in the UNRC than in conventional till.

Table 27.

Herbicide	Rate	Application timing (lb/A)	Nodes Above White Flower (NAWF)				Cotton data (10/13)			
			7/20	7/29	8/3	8/18	Height (in.)	Bolls (no./m <sup>2</sup> )	Stand (plants/m)	Seedcotton yield (lb/A)
<b>Conventional Tillage Cotton</b>										
DP5415RR, Roundup Herb.										
Pendimethalin (Prowl) <i>fb</i>	1.0	PPI								
glyphosate (Roundup)	0.75	OT	7	5	3	0	30	98	13	827
DP5415RR, Conventional Herb.										
Pendimethalin +	1.0									
norflurazon (Zorial) <i>fb</i>	0.5	PPI								
fluometuron (Cotoran 4) <i>fb</i>	0.6	PRE								
pyrithiobac (Staple)	0.053	DIR	7	5	3	1	30	103	13	915
DP5415, Conventional Herb.										
Pendimethalin +	1.0									
norflurazon <i>fb</i>	0.5	PPI								
fluometuron <i>fb</i>	0.6	PRE								
pyrithiobac	0.053	DIR	7	5	3	1	29	96	13	887
BXN47, Buctril Herb.										
Pendimethalin +	1.0									
norflurazon <i>fb</i>	0.5	PPI								
bromoxynil (Buctril)	0.5	OT	6	4	2	0	35	84	13	891
NuCot 33B, Conventional Herb.										
Pendimethalin +	1.0									
norflurazon <i>fb</i>	0.5	PPI								
fluometuron <i>fb</i>	0.6	PRE								
pyrithiobac	0.053	DIR	7	6	4	1	33	92	13	949

continued



**Table 27. Continued.**

Herbicide	Rate	Application timing (lb/A)	Nodes Above White Flower (NAWF)				Cotton data (10/13)			
			7/20	7/29	8/3	8/18	Height (in.)	Bolls (no./m <sup>2</sup> )	Stand (plants/m)	Seedcotton yield (lb/A)
<b>Ultra-Narrow Row Cotton</b>										
DP5415RR, Roundup Herb.										
pendimethalin <i>fb</i>	1.0	PPI								
glyphosate	0.75	OT	4	4	1	0	23	109	38	995
DP5415RR, Conventional Herb.										
Pendimethalin +	1.0									
norflurazon <i>fb</i>	0.5	PPI								
fluometuron <i>fb</i>	0.6	PRE								
pyrithiobac	0.053	OT	5	5	1	1	23	108	39	1072
DP5415, Conventional Herb.										
Pendimethalin +	1.0									
norflurazon <i>fb</i>	0.5	PPI								
fluometuron <i>fb</i>	0.6	PRE								
pyrithiobac	0.053	OT	5	5	1	0	23	104	37	1097
BXN47, Buctril Herb.										
Pendimethalin +	1.0									
norflurazon <i>fb</i>	0.5	PPI								
bromoxynil	0.5	OT	5	4	2	0	27	87	32	1053
NuCot 33B, Conventional Herb.										
pendimethalin +	1.0									
norflurazon <i>fb</i>	0.5	PPI								
fluometuron <i>fb</i>	0.6	PRE								
pyrithiobac	0.053	OT	4	4	1	1	25	96	34	1139
LSD (0.05)			0	NS	1	NS	3	NS	5	142

Table 28. Tillage programs for Roundup Ready cotton, Rohwer, 1999.

## TEST INFORMATION

Location .....	Rohwer	Crop / Cultivar .....	cotton / DP5415RR
Experimental Design / replications .....	RCB / 4	Seeding rate .....	12 lb/A
Plot size .....	25 ft x 50 ft	Planting date / Harvest date ...	May 25, 1999 / Oct. 12, 1999
Row width / Number of rows per plot .....	38" / 8	Soil type .....	silt loam (16% sand, 67% silt, 17% clay)
		% OM .....	2.2

Comments: PRE = preemergence; EOT = early over-the-top at 2-to 4-leaf cotton; EDIR = early post-directed at 2- to 4-leaf cotton; LDIR = late post-directed at 6- to 8-leaf cotton.

Application type	PRE	EOT	EDIR	LDIR
Date applied	May 19, 1999	June 9, 1999	June 9, 1999	June 24, 1999
Time	11:00 am	2:30 pm	7:30 pm	1:00 pm
Incorporation equipment	N/A	N/A	N/A	N/A
Air/soil temperature (F)	82 / 76	90 / 88	90 / 88	86 / 78
Relative humidity	40	50	50	60
Wind (mph)	7	5	5	6
Cloud cover (%)	0	10	0	
Soil moisture	optimal	dry	dry	optimal
Crop stage	N/A	2-4 lf / 8"	2-4- lf / 8"	6-8 lf / 12"
Sprayer type/mph	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3	Tractor-CO <sub>2</sub> / 3	Tractor-CO <sub>2</sub> / 3
Nozzle type/Size	Flat fan / 11003	Flat Fan / 8002	Flat fan / 8002	Flat fan / 11004
Boom ht / # Noz / Spacing (in.)	22 / 8 / 19	24 / 8 / 19	4 / 8 / 19	4 / 8 / 19
Gpa / Psi	15 / 22	15 / 22	11 / 34	15 / 32
<b>Weed species</b>	----- (no. of leaves) -----			
ECHCG	N/A	2-4 lf	2-6 lf	6-8 lf
SORHA	N/A	2-4 lf	2-6 lf	6-8 lf
IPOLA	N/A	2-4 lf	2-6 lf	6-8 lf
BRAPP	N/A	2-4 lf	2-8 lf	6-8 lf

Conclusions: This was the fourth year to conduct this study with the same treatments and plots. Johnsongrass invaded the plots where no glyphosate or over-the-top grass herbicides had been used. Barnyardgrass control was reduced in the conventional herbicide program (no glyphosate) in conservation tillage as compared to conventional-tillage plots. Morningglory control was reduced when glyphosate application was delayed to 8-leaf cotton in conservation-tillage plots.

**Table 28. Section 1.**

Herbicide	Rate (lb/A)	Application timing	Weed control			
			Barnyardgrass (ECHCG)		Broadleaf signalgrass (BRAPP)	
			6/27	7/7	6/27	7/7
			----- (%) -----			
<b>Conventional Tillage:</b>						
Fluometuron (Cotoran) + pendimethalin (Prowl) <i>fb</i>	0.8 1.0	PRE				
fluometuron + MSMA <i>fb</i>	0.8 1.5	EDIR				
cyanazine (Bladex) + MSMA	1.0 1.5	LDIR	90	87	97	100
Glyphosate (Roundup Ultra) <i>fb</i> glyphosate	0.75 0.75	EOT LDIR	93	80	100	100
<b>Conservation Tillage:</b>						
Fluometuron (Cotoran) + pendimethalin (Prowl) <i>fb</i>	0.8 1.0	PRE				
fluometuron + MSMA <i>fb</i>	0.8 1.5	EDIR				
cyanazine (Bladex) + MSMA	1.0 1.5	LDIR	73	57	67	88
Fluometuron + pendimethalin <i>fb</i>	0.8 1.0	PRE				
glyphosate <i>fb</i> glyphosate	0.75 0.56	EOT LDIR	99	87	100	100
Glyphosate <i>fb</i> glyphosate	0.75 0.56	EOT LDIR	85	70	100	98
LSD (0.05)			18	NS	NS	NS

**continued**

Table 28. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control				Seedcotton yield 10/12 (lb/A)
			Johnsongrass (SORHA)		Pitted morningglory (IPOLA)		
			6/27	7/7	6/27	7/7	
			----- (%) -----				
<b>Conventional Tillage:</b>							
Fluometuron (Cotoran) + pendimethalin (Prowl) <i>fb</i>	0.8 1.0	PRE					
fluometuron + MSMA <i>fb</i>	0.8 1.5	EDIR					
cyanazine (Bladex) + MSMA	1.0 1.5	LDIR	47	43	100	100	3125
Glyphosate (Roundup Ultra) <i>fb</i> glyphosate	0.75 0.75	EOT LDIR	100	100	90	85	2895
<b>Conservation Tillage:</b>							
Fluometuron (Cotoran) + pendimethalin (Prowl) <i>fb</i>	0.8 1.0	PRE					
fluometuron + MSMA <i>fb</i>	0.8 1.5	EDIR					
cyanazine (Bladex) + MSMA	1.0 1.5	LDIR	30	43	100	97	2250
Fluometuron + pendimethalin <i>fb</i>	0.8 1.0	PRE					
glyphosate <i>fb</i> glyphosate	0.75 0.56	EOT LDIR	100	95	99	98	3606
Glyphosate <i>fb</i> glyphosate	0.75 0.56	EOT LDIR	98	99	97	57	3112
LSD (0.05)			51	38	NS	24	NS

**Table 29. Multispecies evaluation of glyphosate formulations, Fayetteville, 1999.**

**TEST INFORMATION**

Location .....	Fayetteville	Crop / Cultivar .....	N/A
Experimental Design / replications .....	Split-plot / 3	Seeding rate .....	N/A
Plot size .....	7 ft x 16 ft	Planting date / Harvest date .....	June 8, 1999 / N/A
Row width / Number of rows per plot .....	Species 10" apart	Soil type .....	Taloka silt loam (28% sand, 64% silt, 8% clay)
		% OM .....	1.2

Comments: LOT = late over-the-top. The experiment was a strip-split plot with rates as main plot and formulations as subplots. The interaction of rate by formulation was NS for all species. Grass weeds in broadleaf species were controlled with fluzafop-P (0.25 lb/A).

Application type	LOT
Date applied	July 2, 1999
Time	8:15 pm
Incorporation equipment	N/A
Air/soil temperature (F)	79 / 80
Relative humidity (%)	75
Wind (mph)	3
Cloud cover (%)	0
Soil moisture	wet
Crop stage	N/A
Sprayer type/mph	BkPkCO <sub>2</sub> / 3
Nozzle type/Size	Flat fan / XR8002VS
Boom ht / # Noz / Spacing (in.)	24 / 4 / 17
Gpa / Psi	15 / 26
Weed species (density)	---- (no. of leaves / height in inches) ----
DIGSA (16/ft)	8 lf - tillering / 5"
BRAPP (8/ft)	4 lf / 5"
ORYSA (28/ft)	5 lf / 10"
SORHA (8/ft)	5 lf / 9"
Application type	LOT
<b>Weed species (density/row ft)</b>	---- (no. of leaves / height in inches) ----
SIDSP (27/ft)	5 lf / 3"
CASOB (7/ft)	4 lf / 4"
AMAPA (3-10/ft)	6 lf / 3-4"
AMACH (21/ft)	5 lf / 2.75-3"
SEBEX (26/ft)	5-6 lf / 7"
IPOLA (26/ft)	6 lf - vining / 9.5-12"
IPOHG (11/ft)	4-6 lf - vining / 6"
ABUTH (21/ft)	4 lf / 6"
Sunflower (12/ft)	6-8 lf / 11"
Soybean (6/ft)	V3 / 7"
Cotton (13/ft)	2-3 lf / 8"

Conclusions: Although for some species, rates tended to affect control slightly, neither main effects nor interactions were statistically significant. The trend for increasing control with increasing rate was evident for velvetleaf, morningglory species, hemp sesbania, sicklepod, prickly sida, and red rice. The only trend for formulation differences was with velvetleaf, for which N-580 tended to be weaker than the other formulations.

Table 29. Section 1.

Herbicide	Application		Weed control								
			Sunflower			Velvetleaf (ABUTH)			Entireleaf morningglory (IPOHG)		
			Rate (lb/A)	timing	7/9	7/16	7/23	7/9	7/16	7/23	7/9
----- (%) -----											
Glyphosate (N-545)	0.25	LOT	97	99	99	72	83	82	45	67	58
Glyphosate (N-546)	0.25	LOT	97	98	99	73	83	80	48	70	62
Glyphosate (N-579)	0.25	LOT	97	98	99	71	86	79	47	74	62
Glyphosate (N-580)	0.25	LOT	98	99	98	72	84	83	48	67	57
Glyphosate (Roundup Ultra)	0.25	LOT	99	100	100	74	88	85	55	69	62
Glyphosate (N-545)	0.5	LOT	98	99	99	84	98	98	55	70	68
Glyphosate (N-546)	0.5	LOT	98	99	99	87	97	96	55	70	68
Glyphosate (N-579)	0.5	LOT	98	98	99	78	95	96	60	75	76
Glyphosate (N-580)	0.5	LOT	99	99	100	73	91	84	55	67	68
Glyphosate (Roundup Ultra)	0.5	LOT	98	99	98	77	95	96	64	68	77
Glyphosate (N-545)	1.0	LOT	99	99	100	85	94	92	62	73	73
Glyphosate (N-546)	1.0	LOT	98	98	96	84	96	90	65	80	81
Glyphosate (N-579)	1.0	LOT	100	99	100	92	92	90	55	67	71
Glyphosate (N-580)	1.0	LOT	98	99	100	84	93	88	55	68	73
Glyphosate (Roundup Ultra)	1.0	LOT	99	99	99	88	93	91	63	80	78
LSD (0.05)			NS	NS	NS	NS	NS	NS	NS	NS	NS

continued

**Table 29. Section 2.**

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Pitted morningglory (IPOLA)			Hemp sesbania (SEBEX)			Smooth pigweed (AMACH)		
			7/9	7/16	7/23	7/9	7/16	7/23	7/9	7/16	7/23
----- (% ) -----											
Glyphosate (N-545)	0.25	LOT	37	40	58	40	57	57	100	100	97
Glyphosate (N-546)	0.25	LOT	40	37	60	38	55	57	100	99	98
Glyphosate (N-579)	0.25	LOT	40	43	57	38	52	55	100	100	99
Glyphosate (N-580)	0.25	LOT	42	40	54	42	53	48	100	100	97
Glyphosate (Roundup Ultra)	0.25	LOT	43	43	58	45	60	58	100	100	99
Glyphosate (N-545)	0.5	LOT	48	43	60	48	62	67	100	99	98
Glyphosate (N-546)	0.5	LOT	50	43	62	48	55	58	100	100	99
Glyphosate (N-579)	0.5	LOT	53	42	62	45	58	60	100	100	99
Glyphosate (N-580)	0.5	LOT	50	45	65	45	53	62	100	100	99
Glyphosate (Roundup Ultra)	0.5	LOT	52	40	58	43	55	57	100	100	99
Glyphosate (N-545)	1.0	LOT	57	52	63	53	60	68	100	100	99
Glyphosate (N-546)	1.0	LOT	53	52	83	50	60	74	100	100	100
Glyphosate (N-579)	1.0	LOT	53	48	65	50	58	67	100	100	99
Glyphosate (N-580)	1.0	LOT	47	48	65	47	57	66	100	100	100
Glyphosate (Roundup Ultra)	1.0	LOT	52	57	71	50	60	73	100	100	99
LSD (0.05)			NS	NS	NS	NS	NS	NS	NS	NS	NS

**continued**

Table 29. Section 3.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Palmer amaranth (AMAPA)			Sicklepod (CASOB)			Prickly sida (SIDSP)		
			7/9	7/16	7/23	7/9	7/16	7/23	7/9	7/16	7/23
----- (%) -----											
Glyphosate (N-545)	0.25	LOT	100	100	98	47	80	72	74	89	95
Glyphosate (N-546)	0.25	LOT	100	100	99	62	83	77	77	94	97
Glyphosate (N-579)	0.25	LOT	100	100	100	57	81	73	81	94	94
Glyphosate (N-580)	0.25	LOT	100	100	98	53	83	78	76	92	95
Glyphosate (Roundup Ultra)	0.25	LOT	100	100	99	67	83	80	82	95	97
Glyphosate (N-545)	0.5	LOT	100	100	98	73	88	90	88	98	100
Glyphosate (N-546)	0.5	LOT	100	100	100	77	87	88	82	98	99
Glyphosate (N-579)	0.5	LOT	100	100	100	67	84	87	83	98	99
Glyphosate (N-580)	0.5	LOT	100	100	99	68	85	87	76	97	99
Glyphosate (Roundup Ultra)	0.5	LOT	100	100	99	73	86	87	78	96	99
Glyphosate (N-545)	1.0	LOT	100	100	100	70	88	83	88	98	98
Glyphosate (N-546)	1.0	LOT	100	100	100	72	93	91	90	99	99
Glyphosate (N-579)	1.0	LOT	100	100	99	70	88	85	93	98	99
Glyphosate (N-580)	1.0	LOT	100	100	100	63	84	81	85	98	96
Glyphosate (Roundup Ultra)	1.0	LOT	100	100	99	67	89	83	91	98	97
LSD (0.05)			NS	NS	NS	NS	NS	NS	NS	NS	NS

continued



**Table 29. Section 4.**

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Johnsongrass (SORHA)			Red rice (ORYSA)			Broadleaf signalgrass (BRAPP)		
			7/9	7/16	7/23	7/9	7/16	7/23	7/9	7/16	7/23
			----- (%) -----								
Glyphosate (N-545)	0.25	LOT	100	100	100	75	97	98	100	100	100
Glyphosate (N-546)	0.25	LOT	100	100	100	80	98	99	100	100	100
Glyphosate (N-579)	0.25	LOT	100	100	100	73	98	96	100	100	100
Glyphosate (N-580)	0.25	LOT	100	100	100	74	98	98	100	100	100
Glyphosate (Roundup Ultra)	0.25	LOT	100	100	100	77	98	98	100	100	100
Glyphosate (N-545)	0.5	LOT	100	100	100	75	98	98	100	100	100
Glyphosate (N-546)	0.5	LOT	100	100	100	80	99	99	100	100	100
Glyphosate (N-579)	0.5	LOT	100	100	100	78	99	99	100	100	100
Glyphosate (N-580)	0.5	LOT	100	100	100	80	97	99	100	100	100
Glyphosate (Roundup Ultra)	0.5	LOT	100	100	100	73	97	98	100	100	100
Glyphosate (N-545)	1.0	LOT	100	100	100	99	100	100	100	100	100
Glyphosate (N-546)	1.0	LOT	100	100	100	83	97	99	100	100	100
Glyphosate (N-579)	1.0	LOT	100	100	100	98	100	100	100	100	100
Glyphosate (N-580)	1.0	LOT	100	100	100	87	93	87	100	100	100
Glyphosate (Roundup Ultra)	1.0	LOT	100	100	100	85	95	96	100	100	100
LSD (0.05)			NS	NS	NS	NS	NS	NS	NS	NS	NS

**continued**

Table 29. Section 5.

Herbicide	Rate (lb/A)	Application timing	Large crabgrass (DIGSA)			Cotton injury			Soybean injury					
			control			7/9	7/16	7/23	7/9	7/16	7/23	7/9	7/16	7/23
			7/9	7/16	7/23	----- (%) -----								
Glyphosate (N-545)	0.25	LOT	100	100	100	0	0	0	0	0	0			
Glyphosate (N-546)	0.25	LOT	100	100	100	0	0	0	0	0	0			
Glyphosate (N-579)	0.25	LOT	100	100	100	0	0	0	0	0	0			
Glyphosate (N-580)	0.25	LOT	100	100	100	0	0	0	0	0	0			
Glyphosate (Roundup Ultra)	0.25	LOT	100	100	100	0	0	0	0	0	0			
Glyphosate (N-545)	0.5	LOT	100	100	100	0	0	0	0	0	0			
Glyphosate (N-546)	0.5	LOT	100	100	100	0	0	0	0	0	0			
Glyphosate (N-579)	0.5	LOT	100	100	100	0	0	0	0	0	0			
Glyphosate (N-580)	0.5	LOT	100	100	100	0	0	0	0	0	0			
Glyphosate (Roundup Ultra)	0.5	LOT	100	100	100	0	0	0	0	0	0			
Glyphosate (N-545)	1.0	LOT	100	100	100	0	0	0	0	0	0			
Glyphosate (N-546)	1.0	LOT	100	100	100	0	0	0	0	0	0			
Glyphosate (N-579)	1.0	LOT	100	100	100	0	0	0	0	0	0			
Glyphosate (N-580)	1.0	LOT	100	100	100	0	0	0	0	0	0			
Glyphosate (Roundup Ultra)	1.0	LOT	100	100	100	0	0	0	0	0	0			
LSD (0.05)			NS	NS	NS	NS	NS	NS	NS	NS	NS			

**Table 30. Transgenic cotton in ultra-narrow row, Fayetteville, 1999.**

**TEST INFORMATION**

Location ..... Fayetteville      Crop / Cultivar ..... cotton / several  
 Experimental Design / replications ..... RCB / 4      Planting date / Harvest date ..... June 7, 1999 / N/A  
 Plot size ..... 14 ft x 25 ft      Soil type ..... (28% sand, 64% silt, 8% clay)  
 Row width ..... UNR = 10"; conventional = 40"

Comments: PRE = preemergence; EOT = early over-the-top (1- to 3-lf cotton); G-EOT = over-the-top for grasses (1- to 3-lf grasses); LOT = late over-the-top (5- to 6-lf cotton); A/N = as needed. Most A/N applications were not needed, as indicated in treatment column. Cotton cultivar is indicated at the end of each treatment description.

Application type	PRE	G-EOT	EOT	LOT
Date applied	June 7, 1999	June 22, 1999	July 1, 1999	July 20, 1999
Time	8:00 pm	3:45 pm	8:50 pm	7:45 am
Incorporation equipment	N/A	N/A	N/A	N/A
Air/soil temperature (F)	86 / 86	86 / 86	78 / 80	75 / 80
Relative humidity (%)	45	47	90	73
Wind (mph)	3	7	1	2
Cloud cover (%)	50	80	90	N/A
Soil moisture	moist	wet	wet	wet
Crop stage	N/A	1 lf / 3"	2-4 lf / 5"	5 lf / 13"
Sprayer type/mph	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3
Nozzle type/Size	Flat fan / XR11002	Flat fan / XR11002	Flat fan / XR11002	Flat fan / XR11002
Boom ht / # Noz / Spacing (in.)	18 / 4 / 20	18 / 4 / 20	15 / 4 / 20	15 / 4 / 20
Gpa / Psi	15 / 28	15 / 28	15 / 29	15 / 28
<b>Weed species (density)</b>	----- (no. of leaves / height in inches) -----			
IPOLA (7/m <sup>2</sup> )	N/A	N/A	1-10 lf / 2.75"	4-10 lf / 12.25"
IPOHG (13/m <sup>2</sup> )	N/A	N/A	3-9 lf / 3.5"	N/A
AMAPA (3/m <sup>2</sup> )	N/A	N/A	4-8 lf / 1.75"	N/A
SIDSP (6/m <sup>2</sup> )	N/A	N/A	2-3 lf / 1.5"	1-3 lf / 1.375"
BRAPP (6/m <sup>2</sup> )	N/A	1-3 lf / 1.25"	9-14 lf / 5.75"	N/A
ELEIN (358/m <sup>2</sup> )	N/A	1-4 lf / 0.875"	3-6 lf / 2.5"	24 lf / 7.5"
SETVI (2.7/m <sup>2</sup> )	N/A	N/A	6-9 lf / 4"	N/A

Conclusions: Excellent weed control was obtained in treatments with a preemergence followed by a postemergence treatment. Generally the glyphosate program provided better weed control than the bromoxynil program.

Table 30. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Pitted morningglory (IPOLA)			Entireleaf morningglory (IPOHG)			Palmer amaranth (AMAPA)		
			7/13	8/4	8/17	7/13	8/4	8/17	7/13	8/4	8/17
----- (%) -----											
<b>Ultra-narrow row cotton:</b>											
Glyphosate (Roundup Ultra)	1.0	EOT									
<i>fb</i> glyphosate (PM1220BR)	1.0	LOT	65	95	99	79	99	99	100	100	99
Fluometuron (Cotoran) + metolachlor (Dual Magnum) <i>fb</i> glyphosate <i>fb</i> [pyrithiobac (Staple) + clethodim (Select), not needed]	1.0 0.75 1.0	PRE EOT A/N									
(PM1220BR)			100	100	98	100	100	99	100	100	99
Bromoxynil (Buctril) + pyrithiobac (Staple) + AG-98 and clethodim + Agri-Dex (BXN 47)	0.25 0.047 0.25% 0.25 1%	EOT G-EOT	93	93	96	80	85	83	69	78	74
Fluometuron + metolachlor <i>fb</i> bromoxynil <i>fb</i> [pyrithiobac and clethodim (not needed)] (BXN47)	1.0 0.75 0.25	PRE EOT A/N	100	100	99	100	100	99	100	100	99
<b>Conventional row spacing:</b>											
Glyphosate <i>fb</i> glyphosate (PM1220BR)	1.0 1.0	EOT LOT	71	84	74	91	95	92	100	100	99
Fluometuron + metolachlor <i>fb</i> glyphosate <i>fb</i> [pyrithiobac + clethodim, not needed] (PM1220BR)	1.0 0.75 1.0	PRE EOT A/N	90	98	88	100	99	97	100	100	96

continued

**Table 30. Section 1. Continued.**

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Pitted morningglory (IPOLA)			Entireleaf morningglory (IPOHG)			Palmer amaranth (AMAPA)		
			7/13	8/4	8/17	7/13	8/4	8/17	7/13	8/4	8/17
----- (%) -----											
Bromoxynil (Buctril) + pyrithiobac + AG-98 and clethodim + Agri-Dex (BXN 47)	0.25 0.047 0.25% 0.25 1%	EOT G-EOT	99	88	64	94	92	76	94	91	74
Fluometuron + metolachlor <i>fb</i> bromoxynil <i>fb</i> [pyrithiobac and clethodim (not needed)] (BXN47)	1.0 0.75 0.25 A/N	PRE EOT	100	98	91	100	100	96	100	100	99
Fluometuron + metolachlor <i>fb</i> [pyrithiobac + clethodim (not needed)] (PM1220BR)	1.0 0.75 A/N	PRE A/N	99	97	90	98	97	75	100	100	98
LSD (0.05)			14	7	13	NS	NS	18	20	NS	15

**continued**

Table 30. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Prickly sida (SIDSP)			Broadleaf signalgrass (BRAPP)			Goosegrass (ELEIN)		
			7/13	8/4	8/17	7/13	8/4	8/17	7/13	8/4	8/17
----- (% ) -----											
<b>Ultra-narrow row cotton:</b>											
Glyphosate (Roundup Ultra)	1.0	EOT									
<i>fb</i> glyphosate (PM1220BR)	1.0	LOT	97	99	99	100	100	99	100	100	99
Fluometuron (Cotoran) + metolachlor (Dual Magnum) <i>fb</i> glyphosate <i>fb</i>	1.0 0.75 1.0	PRE EOT									
[pyrithiobac (Staple) + clethodim (Select), not needed] (PM1220BR)		A/N	100	100	99	100	100	99	100	100	99
Bromoxynil (Buctril) + pyrithiobac (Staple) + AG-98 and clethodim + Agri-Dex (BXN 47)	0.25 0.047 0.25% 0.25 1%	EOT G-EOT	98	98	98	98	98	98	99	99	99
Fluometuron + metolachlor <i>fb</i> bromoxynil <i>fb</i> [pyrithiobac and clethodim (not needed)] (BXN47)	1.0 0.75 0.25	PRE EOT A/N	100	100	99	100	100	99	100	100	99
<b>Conventional row spacing:</b>											
Glyphosate <i>fb</i> glyphosate (PM1220BR)	1.0 1.0	EOT LOT	99	100	99	100	100	99	100	100	99
Fluometuron + metolachlor <i>fb</i> glyphosate <i>fb</i> [pyrithiobac + clethodim, not needed] (PM1220BR)	1.0 0.75 1.0	PRE EOT A/N	100	99	96	100	99	94	100	100	99

continued

Table 30. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Prickly sida (SIDSP)			Broadleaf signalgrass (BRAPP)			Goosegrass (ELEIN)		
			7/13	8/4	8/17	7/13	8/4	8/17	7/13	8/4	8/17
----- (%) -----											
Bromoxynil (Buctril) + pyrithiobac + AG-98 and clethodim + Agri-Dex (BXN 47)	0.25 0.047 0.25% 0.25 1%	EOT  G-EOT	95	79	70	100	98	95	98	100	99
Fluometuron + metolachlor <i>fb</i> bromoxynil <i>fb</i> [pyrithiobac and clethodim (not needed)] (BXN47)	1.0 0.75 0.25	PRE  EOT  A/N	100	98	94	100	98	87	100	100	99
Fluometuron + metolachlor <i>fb</i> [pyrithiobac + clethodim (not needed)] (PM1220BR)	1.0 0.75	PRE  A/N	100	97	96	100	100	93	100	100	100
LSD (0.05)			NS	7	6	NS	NS	6	NS	NS	NS

continued

**Table 29. Section 3.**

Herbicide	Rate (lb/A)	Application timing	Green foxtail (SETVI) control			Cotton injury	
			7/13	8/4	8/17	7/13	8/4
			----- (%) -----				
<b>Ultra-narrow row cotton:</b>							
Glyphosate (Roundup Ultra)	1.0	EOT					
<i>fb</i> glyphosate (PM1220BR)	1.0	LOT	100	100	99	2	0
Fluometuron (Cotoran) + metolachlor (Dual Magnum) <i>fb</i> glyphosate <i>fb</i> [pyrithiobac (Staple) + clethodim (Select), not needed] (PM1220BR)	1.0 0.75 1.0	PRE EOT A/N	100	100	99	1	0
Bromoxynil (Buctril) + pyrithiobac (Staple) + AG-98 and clethodim + Agri-Dex (BXN 47)	0.25 0.047 0.25% 0.25 1%	EOT G-EOT	100	100	99	6	0
Fluometuron + metolachlor <i>fb</i> bromoxynil <i>fb</i> [pyrithiobac and clethodim (not needed)] (BXN47)	1.0 0.75 0.25	PRE EOT A/N	100	100	99	1	0

**continued**



**Table 29. Section 3.**

Herbicide	Rate (lb/A)	Application timing	Green foxtail (SETVI) control			Cotton injury	
			7/13	8/4	8/17	7/13	8/4
			----- (%) -----				
<b>Conventional row spacing:</b>							
Glyphosate	1.0	EOT					
<i>fb</i> glyphosate (PM1220BR)	1.0	LOT	100	100	99	2	0
Fluometuron + metolachlor <i>fb</i>	1.0 0.75	PRE					
glyphosate <i>fb</i> [pyrithiobac + clethodim, not needed] (PM1220BR)	1.0	EOT  A/N	100	100	99	5	0
Bromoxynil (Buctril) + pyrithiobac + AG-98 and clethodim + Agri-Dex (BXN 47)	0.25 0.047 0.25% 0.25 1%	EOT  G-EOT	100	100	99	5	0
Fluometuron + metolachlor <i>fb</i> bromoxynil <i>fb</i> [pyrithiobac and clethodim (not needed)] (BXN47)	1.0 0.75 0.25	PRE  EOT  A/N	100	100	99	1	0
Fluometuron + metolachlor <i>fb</i> [pyrithiobac + clethodim (not needed)] (PM1220BR)	1.0 0.75	PRE  A/N	100	100	99	2	0
LSD (0.05)			NS	NS	NS	3	NS

**Table 31. Transgenic cotton in ultra-narrow row, Little Rock, 1999.****TEST INFORMATION**

Location .....	Little Rock	Crop / Cultivar .....	cotton / several
Experimental Design / replications .....	RCB / 4	Planting date / Harvest date .....	May 26, 1999 / N/A
Plot size .....	10 ft x 25 ft	Soil type .....	(28% sand, 56% silt, 16% clay)
Row width .....	UNR = 10"; conventional = 30"		

Comments: PRE = preemergence; EOT = early over-the-top (1- to 3-lf cotton); LOT = late over-the-top (6- to 8-lf cotton); A/N = as needed; 14 A/N = as-need applications needed at 14-node cotton. Most A/N applications were not needed, as indicated in treatment column. Cotton cultivar is indicated at the end of each treatment description.

Application type	PRE	EOT	LOT	14 A/N
Date applied	May 26, 1999	June 11, 1999	June 30, 1999	July 29, 1999
Time	5:25 pm	8:30 pm	8:00 pm	10:30 am
Incorporation equipment	N/A	N/A	N/A	N/A
Air/soil temperature (F)	84 / 85	86 / 84	77 / 80	98 / 104
Relative humidity (%)	39	20	68	64
Wind (mph)	8	2	1	4
Cloud cover (%)	10	30	75	N/A
Soil moisture	moist	moist	moist	moist
Crop stage	N/A	2 lf / 5.5"	8 lf / 12.75"	14 nodes / 38"
Sprayer type/mph	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3	BkPkCO <sub>2</sub> / 3
Nozzle type/Size	Flat fan / XR11002	Flat fan / XR11002	Flat fan / XR11002	Flat fan / XR11002
Boom ht / # Noz / Spacing (in.)	18 / 4 / 20	15 / 4 / 20	15 / 4 / 20	15 / 4 / 20
Gpa / Psi	15 / 40	15 / 26	15 / 29	15 / 29
<b>Weed species (density)</b>	----- (no. of leaves / height in inches) -----			
AMAPA (44/m <sup>2</sup> )	N/A	2-7 lf / 2"	6-7 lf / 3.5"	33-42 lf / 64"
SIDSP (27/m <sup>2</sup> )	N/A	1-2 lf / 0.875"	1-12 lf / 2"	7-8 lf / 8"
IPOHG (16/m <sup>2</sup> )	N/A	2-6 lf / 1.75"	1-14 lf / 7"	2-55 lf / 33.5"
IPOLA (3.5/m <sup>2</sup> )	N/A	2-5 lf / 2.25"	12-23 lf / 11.5"	2 lf / 5.5"
SENOB (8/m <sup>2</sup> )	N/A	1-2 lf / 1.5"	1 lf / 2.75"	5-22 lf / 28.5"
XANST (3/m <sup>2</sup> )	N/A	1 lf / 1.25"	1-5 lf / 2.75"	7-9 lf / 27"

Conclusions: Excellent weed control was obtained in treatments with a preemergence followed by a postemergence treatment. Generally the glyphosate program provided better weed control than the bromoxynil program.

**Table 31. Section 1.**

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Palmer amaranth (AMAPA)				Prickly sida			
			6/11	6/22	7/15	7/29	6/11	6/22	6/29	
----- (%) -----										
<b>Ultra-narrow row cotton:</b>										
Glyphosate (Roundup Ultra)	1.0	EOT								
<i>fb</i> glyphosate (PM1220BR)	1.0	LOT	0	100	100	100	0	96	100	
Fluometuron (Cotoran) + metolachlor (Dual Magnum) <i>fb</i>	1.0 0.75 1.0	PRE EOT								
glyphosate <i>fb</i> [pyrithiobac (Staple) + clethodim (Select), not needed]		A/N								
(PM1220BR)			100	100	100	100	100	100	100	
Glyphosate	1.0	EOT								
<i>fb</i> glyphosate (DP450BR)	1.0	LOT	0	100	100	100	0	99	100	
Fluometuron + metolachlor <i>fb</i>	1.0 0.75	PRE								
glyphosate <i>fb</i> [pyrithiobac + clethodim, not needed]	1.0	EOT A/N								
(DP450BR)			100	100	100	100	100	100	100	
Glyphosate <i>fb</i>	1.0	EOT								
glyphosate (SG125BR)	1.0	LOT	0	100	100	100	0	100	100	
Fluometuron + metolachlor <i>fb</i>	1.0 0.75	PRE								
glyphosate <i>fb</i> [pyrithiobac + clethodim, not needed]	1.0	EOT A/N								
(SG125BR)			100	100	100	100	100	100	100	
Bromoxynil (Buctril) + pyrithiobac + AG-98 <i>fb</i>	0.25 0.047 0.25%	EOT								
clethodim (not needed) (BXN47)	0.25	A/N	0	53	38	34	0	51	5	

**continued**

Table 31. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Palmer amaranth (AMAPA)				Prickly sida		
			6/11	6/22	7/15	7/29	6/11	6/22	6/29
			----- (%) -----						
Fluometuron + metolachlor <i>fb</i> bromoxynil + pyrithiobac + AG-98 <i>fb</i> clethodim (not needed) (BXN 47)	1.0 0.75 0.25 0.047 0.25%	PRE   EOT A/N	100	100	99	100	100	100	100
<b>Conventional row spacing:</b>									
Glyphosate <i>fb</i> glyphosate (PM1220BR)	1.0 1.0	EOT LOT	0	97	100	100	0	95	99
Fluometuron + metolachlor <i>fb</i> glyphosate <i>fb</i> pyrithiobac + (clethodim, not needed) (PM1220BR)	1.0 0.75 1.0 0.062	PRE EOT 14 A/N A/N	100	100	93	96	100	96	93
Bromoxynil + pyrithiobac + AG-98 <i>fb</i> clethodim (not needed) (BXN47)	0.25 0.047 0.25%	EOT A/N	0	50	0	9	0	54	5
Fluometuron + metolachlor <i>fb</i> bromoxynil + pyrithiobac + AG-98 <i>fb</i> clethodim, not needed) (BXN 47)	1.0 0.75 0.25 0.047 0.25%	PRE   EOT A/N	100	100	98	100	100	100	100
Fluometuron + metolachlor <i>fb</i> pyrithiobac + AG-98 <i>fb</i> (clethodim, not needed) (PM1220BR)	1.0 0.75 0.062 0.25%	PRE   14 A/N A/N	100	98	92	94	100	94	94
LSD (0.05)			NS	4	5	5	NS	5	6

continued

**Table 31. Section 2.**

Herbicide	Application Rate (lb/A)	Application timing	Weed control							
			Pitted morningglory (IPOLA)				Entireleaf morningglory (IPOHG)			
			6/11	6/22	7/15	7/29	6/11	6/22	7/15	7/29
			----- (%) -----							
<b>Ultra-narrow row cotton:</b>										
Glyphosate (Roundup Ultra)	1.0	EOT								
<i>fb</i> glyphosate (PM1220BR)	1.0	LOT	0	74	99	99	0	74	99	99
Fluometuron (Cotoran) + metolachlor (Dual Magnum) <i>fb</i>	1.0									
glyphosate <i>fb</i> pyriithiobac (Staple) + clethodim (Select), (not needed) (PM1220BR)	0.75	PRE								
	1.0	EOT								
		A/N	90	98	97	99	90	97	100	99
Glyphosate <i>fb</i> glyphosate (DP450BR)	1.0	EOT								
	1.0	LOT	0	74	98	99	0	74	99	100
Fluometuron + metolachlor <i>fb</i> glyphosate <i>fb</i> [pyriithiobac + clethodim, not needed] (DP450BR)	1.0									
	0.75	PRE								
	1.0	EOT								
		A/N	89	99	99	99	89	100	95	99
Glyphosate <i>fb</i> glyphosate (SG125BR)	1.0	EOT								
	1.0	LOT	0	76	98	100	0	76	98	82
Fluometuron + metolachlor <i>fb</i> glyphosate <i>fb</i> pyriithiobac + clethodim (not needed) (SG125BR)	1.0									
	0.75	PRE								
	1.0	EOT								
		A/N	88	98	97	100	88	97	100	95
Bromoxynil (Buctril) + pyriithiobac + AG-98 <i>fb</i> (clethodim not needed) (BXN47)	0.25									
	0.047									
	0.25%	EOT								
	0.25	A/N	0	81	5	43	0	81	20	48

continued

Table 31. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Pitted morningglory (IPOLA)				Entireleaf morningglory (IPOHG)			
			6/11	6/22	7/15	7/29	6/11	6/22	7/15	7/29
			----- (%) -----							
Fluometuron + metolachlor <i>fb</i> bromoxynil + pyrithiobac + AG-98 <i>fb</i> clethodim (not needed) (BXN 47)	1.0 0.75 0.25 0.047 0.25%	PRE    EOT A/N	89	100	100	98	89	100	100	100
<b>Conventional row spacing:</b>										
Glyphosate <i>fb</i> glyphosate (PM1220BR)	1.0 1.0	EOT LOT	0	70	55	88	0	70	58	85
Fluometuron + metolachlor <i>fb</i> glyphosate <i>fb</i> pyrithiobac + (clethodim, not needed) (PM1220BR)	1.0 0.75 1.0 0.062	PRE  EOT 14 A/N A/N	94	94	93	84	94	94	95	98
Bromoxynil + pyrithiobac + AG-98 <i>fb</i> clethodim (not needed) (BXN47)	0.25 0.047 0.25%	EOT A/N	0	83	0	41	0	83	0	24
Fluometuron + metolachlor <i>fb</i> bromoxynil + pyrithiobac + AG-98 <i>fb</i> clethodim (not needed) (BXN 47)	1.0 0.75 0.25 0.047 0.25%	PRE    EOT A/N	90	100	95	86	90	100	96	100
Fluometuron + metolachlor <i>fb</i> pyrithiobac + AG-98 <i>fb</i> clethodim (not needed) (PM1220BR)	1.0 0.75 0.062 0.25%	PRE   14 A/N A/N	86	68	63	80	86	68	41	48
LSD (0.05)			6	12	12	27	6	12	21	24

continued

**Table 31. Section 3.**

Herbicide	Rate (lb/A)	Application timing	Weed control							Cotton injury	
			Common cocklebur (XANST)			Sicklepod (SENOB)			6/18	6/22	
			6/11	6/22	7/29	6/11	7/15	7/29	(%)	(%)	
<b>Ultra-narrow row cotton:</b>											
Glyphosate (Roundup Ultra)	1.0	EOT									
<i>fb</i> glyphosate (PM1220BR)	1.0	LOT	0	100	100	0	100	100	0	0	
Fluometuron (Cotoran) + metolachlor (Dual Magnum) <i>fb</i>	1.0 0.75	PRE									
glyphosate <i>fb</i> [pyrithiobac (Staple) + clethodim (Select), not needed]	1.0	EOT A/N	92	100	100	96	99	100	0	4	
Glyphosate	1.0	EOT									
<i>fb</i> glyphosate (DP450BR)	1.0	LOT	0	100	100	0	100	100	0	0	
Fluometuron + metolachlor <i>fb</i>	1.0 0.75	PRE									
glyphosate <i>fb</i> pyrithiobac + clethodim (not needed)	1.0	EOT A/N	88	100	100	95	100	100	0	0	
(DP450BR)											
Glyphosate <i>fb</i>	1.0	EOT									
glyphosate (SG125BR)	1.0	LOT	0	100	100	0	100	100	0	1	
Fluometuron + metolachlor <i>fb</i>	1.0 0.75	PRE									
glyphosate <i>fb</i> pyrithiobac + clethodim (not needed)	1.0	EOT A/N	93	100	100	93	100	100	0	0	
(SG125BR)											
Bromoxynil (Buctril) + pyrithiobac + AG-98 <i>fb</i>	0.25 0.047 0.25%	EOT									
clethodim (not needed) (BXN47)	0.25	A/N	0	100	58	0	13	53	0	8	

continued

Table 31. Section 3.

Herbicide	Rate (lb/A)	Application timing	Weed control							Cotton injury	
			Common cocklebur (XANST)			Sicklepod (SENOB)			6/18	6/22	
			6/11	6/22	7/29	6/11	7/15	7/29	(%)	(%)	
Fluometuron + metolachlor <i>fb</i> bromoxynil + pyrithiobac + AG-98 <i>fb</i> clethodim (not needed) (BXN 47)	1.0 0.75 0.25 0.047 0.25%	PRE   EOT A/N	90	99	100	96	96	100	0	10	
<b>Conventional row spacing:</b>											
Glyphosate <i>fb</i> glyphosate (PM1220BR)	1.0 1.0	EOT LOT	0	100	100	0	96	98	0	14	
Fluometuron + metolachlor <i>fb</i> glyphosate <i>fb</i> pyrithiobac + (clethodim, not needed) (PM1220BR)	1.0 0.75 1.0 0.062	PRE EOT 14 A/N A/N	95	78	80	99	78	86	0	16	
Bromoxynil + pyrithiobac + AG-98 <i>fb</i> clethodim (not needed) (BXN47)	0.25 0.047 0.25%	EOT A/N	0	100	40	0	0	13	0	24	
Fluometuron + metolachlor <i>fb</i> bromoxynil + pyrithiobac + AG-98 <i>fb</i> clethodim (not needed) (BXN 47)	1.0 0.75 0.25 0.047 0.25%	PRE   EOT A/N	90	88	74	96	84	80	0	26	
Fluometuron + metolachlor <i>fb</i> pyrithiobac + AG-98 <i>fb</i> clethodim (not needed) (PM1220BR)	1.0 0.75 0.062 0.25%	PRE  14 A/N A/N	91	59	56	93	61	60	0	13	
LSD (0.05)			8	15	22	3	22	22	NS	13	



**Appendix Table 1. Common and trade names, formulation (pounds of active ingredient or acid equivalent per gallon), sponsoring companies, and chemical names of herbicides.<sup>2</sup>**

Common name	Trade name (formulation <sup>y</sup> )	Company	Chemical name
[acifluorfen + bentazon]	Storm (4 SL)	BASF	5-[2-chloro-4-(trifluoromethyl)phenoxy]-2-nitrobenzoic acid + 3-(1-methylethyl)-(1 <i>H</i> )-2,1,3-benzothiadiazin-4(3 <i>H</i> )-one 2,2-dioxide
Activate Plus	non-ionic surfactant	Riverside Terra	--
AG-98	non-ionic surfactant	Rohm and Haas	--
Agri-Dex	crop oil concentrate	Setre (Helena)	--
BAS-620	-- (1.67 EC)	BASF	--
bromoxynil	Buctril (4 EC)	Rhone-Poulenc	3,5-dibromo-4-hydroxybenzoxynil
carfentrazone	Aim (40 DF)	FMC	$\alpha$ ,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> )-( $\pm$ )-2-[1-[[3-chloro-2-propenyl]oxy]imino]propyl]-5-[2-(ethylthio)propyl]-3-hydroxy-2-cyclohexen-1-one
clomazone	Command (3 ME)	FMC	2-[[2-chlorophenyl)methyl]-4,4-dimethyl-3-isoxazolidinone
cyanazine	Bladex (4 F)	DuPont	2-[[4-chloro-6-(ethylamino)-1,3,5-triazin-2-yl]amino]-2-methylpropanenitrile
dicamba	Clarity (4 F)	BASF	3,6-dichloro-2-methoxybenzoic acid
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
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)	Novartis	<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> -
glyphosate	Roundup Ultra (4 SL)	Monsanto	<i>N</i> -(phosphonomethyl)glycine
lactofen	Cobra (2 EC)	Valent	( $\pm$ )-2-ethoxy-1-methyl-2-oxoethyl 5-[2-chloro-4-(trifluoromethyl)phenoxy]-2-nitrobenzoate
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	Bueno 6 (6 SL) (contains surfactant)	many	monosodium salt of MAA
norflurazon	Zorial (80 DF)	Novartis	4-chloro-5-(methylamino)-2-(3-(trifluoromethyl)phenyl)-3(2 <i>H</i> )-pyridazinone
oxyfluorfen	Goal 2XL (2 EC)	Rohm and Haas	2-chloro-1-(3-ethoxy-4-nitrophenoxy)-4-(trifluoromethyl)benzene
paraquat	Gramoxone Extra (2.5 SL)	Zeneca	1,1'-dimethyl-4,4'-bipyridinium ion
pendimethalin	Prowl (3.3 EC)	American Cyanamid	<i>N</i> -(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine
Prime Oil	crop oil concentrate	Riverside Terra	--

continued

Appendix Table 1. Continued.

Common name	Trade name (formulation <sup>y</sup> )	Company	Chemical name
prometryn	Caparol, Cotton Pro (4 F)	Novartis, Griffin	<i>N,N</i> -bis(1-methylethyl)-6-(methylthio)-1,3,5-triazine-2,4-diamine
pyrithiobac	Staple (85 SP)	DuPont	2-chloro-6-[(4,6-dimethoxy-2-pyrimidinyl)thio]benzoic acid
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
sulfosate	Touchdown 5 (5 SL)	Zeneca	trimethylsulfonium carboxymethylaminomethyl phosphonate
trifluralin	Treflan (4 EC)	DowAgroSciences	2,6-dinitro- <i>N,N</i> -dipropyl-4-(trifluoromethyl)benzenamine
2,4-D amine	Weeder 64 (3.8 SL)	Rhone Poulenc	(2,4-dichlorophenoxy)acetic acid

<sup>z</sup> '—' indicates information is not available or not applicable.

<sup>y</sup> 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; SP = soluble powder; F = flowable.

**Appendix Table 1A. 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, Cotton Pro (4 F)	prometryn
Clarity (4 F)	dicamba
Cobra (2 EC)	lactofen
Command (3 ME)	clomazone
Cotoran (4 F)	fluometuron
Direx (80 DF)	diuron
Dual Magnum (7.62 EC)	metolachlor
Fusilade DX (2 EC)	fluazifop-P
Goal 2XL (2 EC)	oxyfluorfen
Gramoxone Extra (2.5 SL)	paraquat
Harvade (5 F)	dimethipin
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
Touchdown 5 (5 SL)	sulfosate
Treflan (4 EC)	trifluralin
Valor (50 DF)	flumioxazin (formerly V-53482)
Weeder 64 (3.8 SL)	2,4-D amine
Zorial (80 DF)	norflurazon

Appendix Table 2. Common, coded, and scientific names of plant species.

Common name	Bayer code <sup>z</sup>	Scientific name
annual bluegrass	POAAN	<i>Poa annua</i> L.
barnyardgrass	ECHCG	<i>Echinochloa crus-galli</i> (L.) Beauv.
broadleaf signalgrass	BRAPP	<i>Brachiaria platyphylla</i> (Griseb.) Nash
buttercup	RANXX	<i>Ranunculus</i> spp.
Carolina geranium	GERCA	<i>Geranium carolinianum</i> L.
carpetweed	MOLVE	<i>Mollugo verticillata</i> L.
common chickweed	STEME	<i>Stellaria media</i> (L.) Vill.
common cocklebur	XANST	<i>Xanthium strumarium</i> L.
common purslane	POROL	<i>Portulaca oleracea</i> L.
curly dock	RUMCR	<i>Rumex crispus</i> L.
cutleaf eveningprimrose	OEOLA	<i>Oenothera laciniata</i> Hill
entireleaf morningglory	IPOHG	<i>Ipomoea hederacea</i> var. <i>integriscula</i> Gray
goosegrass	ELEIN	<i>Eleusine indica</i> (L.) Gaertn.
green foxtail	SETVI	<i>Setaria viridis</i> (L.) Beauv.
hairy vetch	VICVI	<i>Vicia villosa</i> Roth.
hemp sesbania	SEBEX	<i>Sesbania exaltata</i> (Raf.) Rydb. ex A. W. Hill
henbit	LAMAM	<i>Lamium amplexicaule</i> L.
johnsongrass	SORHA	<i>Sorghum halepense</i> L. (Pers.)
large crabgrass	DIGSA	<i>Digitaria sanguinalis</i> (L.) Scop.
mayweed	ANTCO	<i>Anthemis cotula</i> L.
Palmer amaranth	AMAPA	<i>Amaranthus palmeri</i> S. Wats
pitted morningglory	IPOLA	<i>Ipomoea lacunosa</i> L.
plains coreopsis	CRLTI	<i>Coreopsis tinctoria</i> Nutt.
prickly sida	SIDSP	<i>Sida spinosa</i> L.
prostrate spurge	EPHHT	<i>Euphorbia humistrata</i> Engelm. ex Gray
red rice	ORYSA	<i>Oryza sativa</i> L.
redroot pigweed	AMARE	<i>Amaranthus retroflexus</i> L.
rice flatsedge	CYPIR	<i>Cyperus iria</i> L.
sicklepod	SENOB	<i>Senna obtusifolia</i> L.
smooth pigweed	AMACH	<i>Amaranthus hybridus</i> L.
swinecress	COPDI	<i>Coronopus didymus</i> (L.) Sm.
velvetleaf	ABUTH	<i>Abutilon theophrasti</i> Medicus
Virginia pepperweed	LEPVI	<i>Lepidium virginicum</i> L.
yellow nutsedge	CYPES	<i>Cyperus esculentus</i> L.

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

**Appendix Table 3. Climatological data, Main Experiment Station, Fayetteville, 1999.**

Day	April			May			June			July		
	Temp.		Rain-fall (in.)	Temp.		Rain-fall (in.)	Temp.		Rain-fall (in.)	Temp.		Rain-fall (in.)
	Max. (°F)	Min. (°F)		Max. (°F)	Min. (°F)		Max. (°F)	Min. (°F)		Max. (°F)	Min. (°F)	
1	61	61		71	43		78	68	0.58	82	66	0.32
2	73	62		75	47		83	59		81	67	2.95
3	76	60	1.1	72	58		86	66		87	67	
4	70	44	1.0	74	58	0.66	86	72		88	70	
5	77	54	0.17	69	55	1.57	85	74		89	71	
6	71	45	0.3	76	47		86	73		88	72	
7	75	49		69	48		86	70	0.25 <sup>z</sup>	92	72	0.24
8	78	49		79	44		88	71		91	71	
9	76	51	0.17	81	50		87	67		91	74	
10	74	55		82	48		86	69		90	72	
11	76	47		82	44	2.34	85	66	0.51	77	66	1.28
12	68	44		79	60	1.52	84	65		78	57	
13	72	51		67	45		86	69		77	58	
14	72	51	0.76	73	48		82	66		82	60	
15	57	42	0.11	79	56		79	57		88	65	
16	53	36		81	58		79	61		88	71	
17	52	35		83	62	0.47	68	54	0.82	87	71	0.50*
18	59	36		66	50	0.58	73	51		89	69	
19	68	58		73	49		78	58	0.05	91	73	
20	78	47		77	55		78	60	0.70	90	72	
21	83	57		77	60	0.69	76	67	0.15	90	73	
22	80	62		73	60		83	66	.29	90	73	
23	73	60	0.17	82	50	1.01	83	68	0.17	91	75	1.0*
24	66	58	0.01	76	49	1.01	80	68	0.40	94	73	
25	66	59		78	58		80	65	0.93	96	75	
26	67	55	0.81	73	57	0.58	88	68	0.09	96	79	
27	73	52	0.41	72	48		89	70		95	75	1.0*
28	73	48	0.10	75	52		87	78		95	76	
29	67	50		77	56		87	64	0.20	96	78	
30	69	46		74	61	0.05	81	67	2.95	98	78	
31				78	61	0.10				96	78	

<sup>z</sup> \* indicates irrigation.

Appendix Table 4. Climatological data, Cotton Branch Experiment Station, Marianna, 1999.

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	60	54	0.001	71	51		77	68		85	71	
2	72	58		76	53		87	65	0.21	88	76	
3	74	64	T <sup>z</sup>	76	60		80	67	0.44	90	75	
4	79	61	2.44	81	63		91	72		92	75	
5	78	63	0.13	76	64	1.19	91	73		91	75	
6	78	55	0.39	82	58	1.52	93	75		92	75	
7	77	54		74	54		94	72		94	75	
8	81	59		78	55		92	69		NA <sup>y</sup>	NA	0.54
9	76	68		84	60		92	72		92	75	
10	84	65		86	64		93	72		70	75	T
11	77	54		85	65		94	71	0.04	89	68	2.72
12	79	52		74	61		94	70		75	67	0.17
13	71	53		80	58		82	72	0.05	80	65	
14	70	55		79	55		86	70	1.19	84	64	
15	63	54	0.52	79	59		93	66		85	67	
16	58	41		87	65	0.04	81	63		89	72	
17	60	40		89	71		82	63		90	71	
18	55	35		89	63	0.27	78	58		89	72	
19	66	39		77	56		81	61		92	74	
20	82	49		80	59		85	68		93	74	
21	83	54		83	63		85	68		91	74	
22	84	62		82	67		89	69		91	74	
23	83	66		88	67	0.03	91	71		94	74	
24	86	60		85	59		83	74	0.21	96	75	
25	63	55	0.65	81	60		86	70	0.78	97	77	
26	76	58	1.03	80	64	0.05	83	72	0.25	96	76	
27	80	63	1.17	77	55		83	72	1.24	96	77	
28	77	57		81	59		89	75		97	73	0.02
29	76	57		84	62		87	77	T	97	75	
30	66	53		87	68		86	70	0.31	99	76	
31				83	67	0.17				97	77	

<sup>z</sup> T = trace amount.<sup>y</sup> NA = not available.

**Appendix Table 5. Climatological data, Southeast Branch Experiment Station, Rohwer, 1999.**

Day	April			May			June			July		
	Temp.		Rain-fall (in.)	Temp.		Rain-fall (in.)	Temp.		Rain-fall (in.)	Temp.		Rain-fall (in.)
	Max. (°F)	Min. (°F)		Max. (°F)	Min. (°F)		Max. (°F)	Min. (°F)		Max. (°F)	Min. (°F)	
1	67	54	0.01	73	50		81	68	0.02	87	71	
2	76	59		78	52		89	65	0.33	91	76	
3	72	65		85	60	0.02	92	72		92	74	
4	82	60	2.46	83	2		94	73		93		0.16
5	82	66	0.75	78	67	0.45	97	74		93	76	
6	82	55	0.31	85	57	0.32	95	74		93	76	
7	80	55		78	52		96	70		94	75	0.04
8	86	61		80	54		94	70		94	76	0.62
9	82	68		88	53		94	71		92	74	
10	88	63		90	63		94	68		91	74	
11	84	56		87	66		95	69		91	73	0.70
12	82	57		75	58		95	69	0.05	80	66	
13	76	53		86	60		84	70	0.07	82	64	
14	77	55		82	52		93	69	1.32	85	68	
15	68	56	0.61	86	59		85	67	0.03	86	71	
16	61	41		90	63		83	66		91	70	
17	63	38		92	70		84	66		91	71	
18	65	37		90	63	0.49	80	58		91	72	
19	69	49		79	54		81	55		92	74	0.67
20	84	55		82	60		86	55		92	74	
21	86	60		82	67		88	55		93	73	
22	86	64		90	66		87	68		93	72	0.10
23	88	67		78	65	0.22	91	75		93	74	
24	91	69		87	63		86	73	0.38	95	74	
25	73	51		84	61		90	71	0.12	97	76	
26	83	63	2.43	89	66		83	72	0.62	97	77	
27	84	62	0.40	83	60		86	72	0.87	96	78	
28	83	57		84	62		91	72		97	78	
29	81	59		86	66		90	78	0.04	97	77	
30	70	55		91	66	0.06	90	70	0.15	98	76	
31				87	66	1.27				98	76	