

HERBICIDE EVALUATION IN ARKANSAS RICE, 1999

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INTRODUCTION

Herbicide weed control is economically important for production of rice. Field experiments are conducted annually in Arkansas to evaluate the activity of developmental and commercial herbicides for selective control of weeds in rice. 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 rice. Ron Talbert, located at the Main Experiment Station, Fayetteville, conducts research at Fayetteville and

at the Rice Research and Extension Center, Stuttgart. Ken Smith is located at the Southeast Research and Extension Center at Monticello. David Gealy is located at the Dale Bumpers National Rice Research Center at Stuttgart. Ford Baldwin's rice research is located primarily at the Lonoke location of the University of Arkansas at Pine Bluff, with occasional experiments at Stuttgart and Lodge Corner.

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 thru 6.

METHODS

Pertinent information specific to each field test precedes each data table. Included is information on general field conditions, field maintenance, and herbicide application and general conclusions from the data. All test areas were fertilized as recommended from soil tests. Weed densities were taken in most experiments and are presented in each table. Densities, expressed as no./ft², are natural populations or from populations broadcast-seeded. Those expressed as no./row ft were seeded in rows across the rice rows.

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 for compounds having more than one trade name or manufacturer. The Stam® formulation was used where propanil formulation is not designated. Herbicides formulated as pre-packaged mixtures are listed in tables by their component herbicides in parentheses. All herbicide rates are expressed in pounds of active ingredient (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, crop yields, and crop stand counts. Percentages of weed control and crop injury were visually estimated: 0% represents no effect, and 100% represents complete kill. Rice yield is reported as lb/A; 1 bushel = 45 pounds. Data were subjected to analysis of variance, 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:

BF, before flood
 BkPkCO₂, CO₂ backpack sprayer
 Cot., cotyledon
 DAT, days after treatment
 DF, dry flowable formulation
 DPRE, delayed preemergence
 EC, emulsifiable concentrate
 EPOST, early postemergence
 F, flowable formulation
fb, followed by
 FF, flat fan nozzle
 Gpa, gallons per acre
 G or GR, granular formulation
 lf, leaf
 LPOST, late postemergence
 LSD, least significant difference
 ME, microencapsulated
 MP-44, annual weed control recommendations for Arkansas
 MPOST, mid-postemergence timing
 N/A, not applicable or not available
 Noz, nozzles
 NS, not significant
 PI, panicle initiation
 POFL, after flood
 POST, postemergence
 PPI, preplant incorporated
 PPL, preplant (not incorporated)
 PRE, preemergence
 PREFL, pre-flood
 RCB, randomized complete block (experimental design)
 R-ECHCG - propanil-resistant barnyardgrass
 Till, tillering
 UAPB, University of Arkansas at Pine Bluff
 WAF, weeks after flood
 XR, extended range nozzle

Table 1. Weed control evaluation in glufosinate (Liberty)-tolerant rice, Stuttgart, 1999.

TEST INFORMATION

Location	Stuttgart	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 16, 1999
Plot size	6 ft by 16 ft	Crop / Variety	Rice / Liberty-tolerant Bengal
Row width / Number of rows per plot	6.5 in. / 9 rows	Dates of flushing	May 16, 25, and June 9, 1999
Soil type	Dewitt silt loam (8% sand, 75% silt, 16% clay)	Date of flooding	June 21, 1999
% OM / pH	1 / 5.4		

Comments: DPRE = delayed preemergence; EPOST = early postemergence; and PREFL = pre-flood. Yield is adjusted to 12% moisture.

Application type	DPRE	EPOST	PREFL
Date applied	5/18/99	6/2/99	6/18/99
Time	7:30 pm	1:00 pm	6:30 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	70 / 75	82 / 86	69 / 70
Relative humidity (%)	72	82	66
Wind (mph)	2	1	4
Weather	clear	partly cloudy	clear
Soil moisture	moist	wet	moist
Crop stage/Height	N/A	2-3 lf / 6"	4-5 lf / 8"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Turbo TJ / 110015	Teejet XR / 11001 VS	Teejet XR / 11001 VS
Boom ht / # Noz / Spacing (in.)	15 / 3 / 18	15 / 3 / 18	14 / 3 / 18
Gpa / Psi	10 / 22	10 / 41	10 / 42
Weed species (density)	-----	[# leaves/height (in.)]	-----
R-ECHCG (27/row ft)	N/A	2-3 lf / 0.5-1"	4-7 lf, 2 tiller / 8-10"
ECHCG (29/row ft)	N/A	2 lf / 0.5-0.75"	4-6 lf, 2 tiller / 6-8"
BRAPP (6/ft ²)	N/A	3 lf / 3.5"	6-9 lf, 3 tiller / 3-4"
IPOWR (6/row ft)	N/A	2-3 lf / 2-4"	8-10 lf / 3-4"
IPOLA (21/row ft)	N/A	2-3 lf / 2-4"	8-10 lf / 8-12"
SEBEX (30/row ft)	N/A	3-4 lf / 2.5-3"	6-8 lf / 8-10"
AESVI (15/row ft)	N/A	cot.-1 lf / 0.5-0.75"	4-5 lf / 3-4"

Conclusions: A sequential application of glufosinate at 0.31-0.37 lb/A applied EPOST followed by an additional application of 0.18-0.31 lb/A at PREFL was an excellent program for controlling a majority of the weeds common to rice production when used in Liberty-link rice system. This study showed that glufosinate at 0.31 lb/A could be applied as PREFL application to pick up weed escapes following DPRE applications of pendimethalin, clomazone, and quinclorac, and EPOST applications of propanil (Super Wham) and fenoxaprop + safener. One concern, which will be further evaluated, is the reduction in morningglory control when glufosinate is applied as a follow up of clomazone and fenoxaprop + safener.

Table 1. Section 1.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass control							
			Resistant (R-ECHCG)				Susceptible (ECHCG)			
			6/9	6/17	7/7	7/28	6/9	6/17	7/7	7/28
			----- (%) -----							
Untreated check			0	0	0	0	0	0	0	0
Glufosinate <i>fb</i>	0.31	EPOST								
glufosinate	0.31	PREFL	100	99	100	100	99	99	100	98
Glufosinate <i>fb</i>	0.36	EPOST								
glufosinate	0.18	PREFL	100	98	100	100	100	99	100	100
Glufosinate <i>fb</i>	0.36	EPOST								
glufosinate	0.28	PREFL	100	99	100	100	100	99	100	99
Pendimethalin <i>fb</i>	1.0	DPRE								
glufosinate	0.31	PREFL	99	97	100	98	96	99	100	99
Clomazone <i>fb</i>	0.4	DPRE								
glufosinate	0.31	PREFL	100	99	100	98	99	99	100	100
Quinclorac <i>fb</i>	0.25	DPRE								
glufosinate	0.31	PREFL	99	96	99	98	99	99	100	100
Propanil (Super Wham)	4.0	EPOST								
<i>fb</i> glufosinate	0.31	PREFL	35	90	93	100	97	90	100	100
(Fenoxaprop + safener)	0.098	EPOST								
<i>fb</i> glufosinate	0.31	PREFL	99	97	94	99	98	99	98	100
Propanil (Stam M-4) <i>fb</i>	3.0	EPOST								
propanil (Stam M-4)	3.0	PREFL	18	13	10	0	85	84	98	88
Quinclorac <i>fb</i>	0.25	DPRE								
(propanil +molinate)	4.5									
+ triclopyr	0.19	PREFL	100	97	98	100	100	97	100	100
LSD (0.05)			7	7	5	3	4	4	3	2

continued

Table 1. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Broadleaf signalgrass (BRAPP)			Hemp sesbania (SEBEX)			
			6/9	7/7	7/28	6/9	6/17	7/7	7/28
			----- (%) -----						
Untreated check			0	0	0	0	0	0	0
Glufosinate <i>fb</i>	0.31	EPOST							
glufosinate	0.31	PREFL	100	100	100	98	96	100	100
Glufosinate <i>fb</i>	0.36	EPOST							
glufosinate	0.18	PREFL	100	100	100	98	98	100	100
Glufosinate <i>fb</i>	0.36	EPOST							
glufosinate	0.28	PREFL	100	100	100	98	93	100	99
Pendimethalin <i>fb</i>	1.0	DPRE							
glufosinate	0.31	PREFL	93	95	100	16	13	89	96
Clomazone <i>fb</i>	0.4	DPRE							
glufosinate	0.31	PREFL	99	100	100	24	15	90	100
Quinclorac <i>fb</i>	0.25	DPRE							
glufosinate	0.31	PREFL	100	100	100	69	76	85	100
Propanil (Super Wham)	4.0	EPOST							
<i>fb</i> glufosinate	0.31	PREFL	98	100	100	94	94	95	100
(Fenoxaprop + safener)	0.098	EPOST							
<i>fb</i> glufosinate	0.31	PREFL	100	100	100	10	0	94	100
Propanil (Stam M-4) <i>fb</i>	3.0	EPOST							
propanil (Stam M-4)	3.0	PREFL	95	90	94	96	95	90	100
Quinclorac <i>fb</i>	0.25	DPRE							
(propanil +molinate)	4.5								
+ triclopyr	0.19	PREFL	100	100	100	64	73	90	100
LSD (0.05)			4	3	3	8	11	6	2

continued

Table 1. Section 3.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Northern jointvetch (AESVI)				Pitted morningglory (IPOLA)			
			6/9	6/17	7/7	7/28	6/9	6/17	7/7	7/28
			----- (%) -----							
Untreated check			0	0	0	0	0	0	0	0
Glufosinate <i>fb</i>	0.31	EPOST								
glufosinate	0.31	PREFL	93	85	93	100	94	89	96	95
Glufosinate <i>fb</i>	0.36	EPOST								
glufosinate	0.18	PREFL	95	85	89	100	96	93	100	100
Glufosinate <i>fb</i>	0.36	EPOST								
glufosinate	0.28	PREFL	93	88	94	89	94	92	98	100
Pendimethalin <i>fb</i>	1.0	DPRE								
glufosinate	0.31	PREFL	5	15	81	100	11	28	80	93
Clomazone <i>fb</i>	0.4	DPRE								
glufosinate	0.31	PREFL	33	24	88	97	35	19	80	78
Quinclorac <i>fb</i>	0.25	DPRE								
glufosinate	0.31	PREFL	75	70	89	100	64	77	80	100
Propanil (Super Wham)	4.0	EPOST								
<i>fb</i> glufosinate	0.31	PREFL	94	90	95	100	43	36	89	100
(Fenoxaprop + safener)	0.098	EPOST								
<i>fb</i> glufosinate	0.31	PREFL	3	0	89	94	10	5	55	68
Propanil (Stam M-4) <i>fb</i>	3.0	EPOST								
propanil (Stam M-4)	3.0	PREFL	92	86	85	94	41	31	13	8
Quinclorac <i>fb</i>	0.25	DPRE								
(propanil +molinate)	4.5									
+ triclopyr	0.19	PREFL	65	58	85	100	61	73	94	100
LSD (0.05)			10	13	8	6	6	13	9	8

continued

Table 1. Section 4.

Herbicide	Rate (lb/A)	Application timing	Palmleaf morningglory (IPOWR) control				Effect on rice				Yield 9/16 (lb/A)
			6/17	6/24	6/29	7/28	Injury				
			----- (%) -----				6/17	6/24	6/29	7/28	
Untreated check			0	0	0	0	0	0	0	0	5596
Glufosinate <i>fb</i>	0.31	EPOST									
glufosinate	0.31	PREFL	99	93	100	96	0	0	0	0	8458
Glufosinate <i>fb</i>	0.36	EPOST									
glufosinate	0.18	PREFL	100	96	100	100	0	0	0	0	8083
Glufosinate <i>fb</i>	0.36	EPOST									
glufosinate	0.28	PREFL	99	94	100	100	0	0	0	0	8764
Pendimethalin <i>fb</i>	1.0	DPRE									
glufosinate	0.31	PREFL	30	30	13	95	0	0	0	0	7806
Clomazone <i>fb</i>	0.4	DPRE									
glufosinate	0.31	PREFL	51	10	35	75	24	16	21	5	7964
Quinclorac <i>fb</i>	0.25	DPRE									
glufosinate	0.31	PREFL	96	88	75	99	0	0	0	0	8449
Propanil (Super Wham)	4.0	EPOST									
<i>fb</i> glufosinate	0.31	PREFL	58	40	49	100	0	0	0	0	8686
(Fenoxaprop +safener)	0.098	EPOST									
<i>fb</i> glufosinate	0.31	PREFL	14	13	34	65	0	0	0	0	8282
Propanil (Stam M-4) <i>fb</i>	3.0	EPOST									
propanil (Stam M-4)	3.0	PREFL	58	40	48	5	1	0	0	0	7676
Quinclorac <i>fb</i>	0.25	DPRE									
(propanil +molinate)	4.5										
+ triclopyr	0.19	PREFL	95	81	69	100	0	0	0	0	8142
LSD (0.05)			16	13	14	8	4	3	1	2	781

Table 2. Yellow nutsedge control in Liberty-tolerant rice, Lodge Corner, 1999.**TEST INFORMATION**

Location	Lodge Corner	Planting date	May 3, 1999
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	7 ft by 20 ft	Crop / Variety	Rice / Liberty
Row width / Number of rows per plot	7.5 in. / 9 rows	Dates of flushing	May 15, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 8, 1999
% OM / pH	1.3 / 5.1		

Comments: PRE = preemergence; 2-3 LF = 2-3 leaf rice; PREFL = pre flood; and POFL = post flood.

Application type	PRE	2-3 LF	PREFL	POFL
Date applied	5/3/99	5/24/99	6/3/99	6/23/99
Time	5:50 pm	3:25 pm	2:10 pm	12:00 pm
Incorporation equipment	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	85 / 71	82 / 79	91 / 80	83 / 80
Relative humidity (%)	60	32	64	82
Wind (mph)	5.5	1.5	5	4.5
Weather	partly cloudy	clear	partly cloudy	cloudy
Soil moisture	moist	damp	moist	flooded
Crop stage/Height	N/A	2-3 lf / 6.5"	4 lf / 9"	tiller / 18"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	15 / 3 / 20	18 / 3 / 20	18 / 3 / 20	48 / 3 / 20
Gpa / Psi	10 / 21	10 / 19	10 / 15	10 / 13
Weed species	----- (# leaves/height) -----			
CYPES	N/A	5-6 lf / 8.5"	4 lf / 9"	bloom / 14"
SEBEX	N/A	coty. / 0.5"	N/A	N/A

Conclusions: This location had a severe infestation of barnyardgrass, yellow nutsedge, and a scattered infestation of red rice and other weeds. Repeat treatments of glufosinate provided good control of most weeds, but only moderate control of yellow nutsedge.

Table 2. Section 1.

Herbicide	Rate (lb/A)	Application timing	Yellow nutsedge (CYPES) control				
			5/24	6/3	6/11	6/25	8/3
			----- (%) -----				
Untreated check			0	0	0	0	0
Glufosinate	0.36	2-3 LF	0	38	48	13	8
Glufosinate	0.36	PREFL	0	0	45	74	81
Glufosinate <i>fb</i>	0.36	2-3 LF					
glufosinate	0.25	PREFL	0	40	60	46	25
Glufosinate	0.5	PREFL	0	0	40	68	79
Glufosinate	0.72	PREFL	0	0	45	65	79
Glufosinate <i>fb</i>	0.25	2-3 LF					
glufosinate	0.25	PREFL	0	45	55	59	46
Glufosinate <i>fb</i>	0.36	2-3 LF					
glufosinate	0.36	PREFL	0	40	63	68	69
Glufosinate <i>fb</i>	0.36	2-3 LF					
glufosinate	0.36	POFL	0	30	30	18	79
Glufosinate	0.36	POFL	0	0	0	20	73
Clomazone +	0.3						
quinclorac <i>fb</i>	0.188	PRE					
glufosinate	0.36	PREFL	41	8	53	43	68
Propanil +	4.0						
halosulfuron +	0.031						
AG-98 (0.25%) <i>fb</i>		2-3 LF					
propanil +	4.0						
halosulfuron +	0.031						
AG-98 (0.25%)		PREFL	0	59	88	93	93
Propanil +	4.0						
bensulfuron <i>fb</i>	0.031	2-3 LF					
propanil +	4.0						
bensulfuron	0.031	PREFL	0	46	74	74	70
LSD (0.05)			7	12	11	36	36

continued

Table 2. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Hemp sesbania (SEBEX)		Barnyardgrass (ECHCG)	Northern jointvetch (AESVI)		Annual grasses
			5/24	6/25	6/3	6/11	6/25	6/25
Untreated check			0	0	21	0	0	0
Glufosinate	0.36	2-3 LF	0	40	99	43	40	96
Glufosinate	0.36	PREFL	0	100	95	60	100	98
Glufosinate <i>fb</i>	0.36	2-3 LF						
glufosinate	0.25	PREFL	0	94	93	45	94	98
Glufosinate	0.5	PREFL	0	70	95	80	70	95
Glufosinate	0.72	PREFL	0	100	99	78	100	98
Glufosinate <i>fb</i>	0.25	2-3 LF						
glufosinate	0.25	PREFL	0	75	100	60	75	98
Glufosinate <i>fb</i>	0.36	2-3 LF						
glufosinate	0.36	PREFL	0	83	88	83	83	95
Glufosinate <i>fb</i>	0.36	2-3 LF						
glufosinate	0.36	POFL	0	100	100	63	100	91
Glufosinate	0.36	POFL	0	73	88	0	73	61
Clomazone + quinclorac <i>fb</i>	0.3 0.188	PRE						
glufosinate	0.36	PREFL	38	95	98	75	95	96
Propanil + halosulfuron + AG-98 (0.25%) <i>fb</i>	4.0 0.031	2-3 LF						
propanil + halosulfuron + AG-98 (0.25%)	4.0 0.031	PREFL	0	98	95	90	98	93
Propanil + bensulfuron <i>fb</i>	4.0 0.031	2-3 LF						
propanil + bensulfuron	4.0 0.031	PREFL	0	100	91	93	100	99
LSD (0.05)			3	38	22	18	38	16

continued

Table 2. Section 3.

Herbicide	Rate (lb/A)	Application timing	Red rice (ORYSA) control		Rice injury				
			8/3	5/24	6/3	6/11	6/25	8/3	
			----- (%) -----						
Untreated check			13	0	0	0	0	0	0
Glufosinate	0.36	2-3 LF	95	0	0	0	0	0	0
Glufosinate	0.36	PREFL	90	0	0	0	3	0	0
Glufosinate <i>fb</i> glufosinate	0.36 0.25	2-3 LF PREFL	98	0	0	0	0	0	0
Glufosinate	0.5	PREFL	94	0	0	0	0	0	0
Glufosinate	0.72	PREFL	90	0	0	0	0	0	0
Glufosinate <i>fb</i> glufosinate	0.25 0.25	2-3 LF PREFL	98	0	3	0	3	0	0
Glufosinate <i>fb</i> glufosinate	0.36 0.36	2-3 LF PREFL	96	0	0	0	0	0	0
Glufosinate <i>fb</i> glufosinate	0.36 0.36	2-3 LF POFL	100	0	0	0	8	0	0
Glufosinate	0.36	POFL	100	0	0	0	5	0	0
Clomazone + quinclorac <i>fb</i> glufosinate	0.3 0.188 0.36	PRE PREFL	79	0	14	0	0	0	0
Propanil + halosulfuron + AG-98 (0.25%) <i>fb</i> propanil + halosulfuron + AG-98 (0.25%)	4.0 0.031 4.0 0.031	2-3 LF PREFL	71	0	31	0	0	0	0
Propanil + bensulfuron <i>fb</i> propanil + bensulfuron	4.0 0.031 4.0 0.031	2-3 LF PREFL	68	0	3	0	0	0	0
LSD (0.05)			19	0	5	0	4	0	0

Table 3. Red rice control with glufosinate (Liberty), Stuttgart, 1999.**TEST INFORMATION**

Location	Stuttgart	Planting date	May 17, 1999
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	7 ft by 20 ft	Crop / Variety	Rice / Liberty
Row width / Number of rows per plot	7.5 in. / 9 rows	Dates of flushing	May 25, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	July 2, 1999
% OM / pH	1.4 / 4.8		

Comments: DPRE = delayed preemergence; 2-3 LF = 2-3 leaf rice; PREFL = pre-flood; and POFI = postflood.

Application type	DPRE	2-3 LF	PREFL	POFL
Date applied	5/19/99	6/4/99	6/11/99	7/7/99
Time	2:35 pm	10:20 am	11:00 am	11:45 am
Incorporation equipment	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	86 / 84	83 / 79	88 / 82	85 / 80
Relative humidity (%)	29	68	61	74
Wind (mph)	2	6	3	0
Weather	clear	cloudy	clear	clear
Soil moisture	moist	saturated	dry	flooded
Crop stage/Height	N/A	3 lf / 6"	early tillering / 11"	5 tiller / 20"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 80067	Driftguard / 110015	Driftguard / 8002	Driftguard / 8004
Boom ht / # Noz / Spacing (in.)	16 / 4 / 20	20 / 4 / 20	23 / 4 / 20	32 / 4 / 20
Gpa / Psi	10 / 18	10 / 20	10 / 10	10 / 11
Weed species	----- [# leaves/height (in.)] -----			
BRAPP	N/A	3 lf / 3"	N/A	N/A
SEBEX	N/A	4 lf / 6"	4 lf / 10"	adult / 25"
IPOLA	N/A	2-5 lf / 4"	5 lf / 6"	1 runner / 6"
SIDSP	N/A	2 lf / 2.5"	3 lf / 3-4"	N/A
ORYSA	N/A	3 lf / 6"	tiller / 9"	1 tiller / 12"
ECHCG	N/A	N/A	N/A	heading / 25"

Conclusions: This study was conducted in a location with a dense infestation of natural and overseeded red rice. Liberty Link rice continues to show promise for red rice control, and two applications will be required.

Table 3. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Pitted morningglory (IPOLA)				Hemp sesbania (SEBEX)				
			5/25	6/11	6/18	6/25	5/25	6/11	6/18	6/25	7/7
Untreated check			0	0	0	0	0	0	0	0	0
Glufosinate	0.36	PREFL	0	0	86	31	0	0	95	85	95
Glufosinate	0.72	PREFL	0	0	89	64	0	0	86	93	95
Glufosinate	0.36	2-3 LF	0	100	88	70	0	100	86	90	95
Glufosinate <i>fb</i>	0.36	2-3 LF									
glufosinate	0.188	PREFL	0	100	89	44	0	100	88	84	95
Glufosinate <i>fb</i>	0.36	2-3 LF									
glufosinate	0.25	PREFL	0	100	93	68	0	100	90	93	95
Glufosinate <i>fb</i>	0.36	2-3 LF									
glufosinate	0.36	PREFL	0	98	94	81	0	100	89	96	95
Glufosinate <i>fb</i>	0.25	2-3 LF									
glufosinate	0.25	PREFL	0	99	88	85	0	100	88	90	95
Glufosinate <i>fb</i>	0.25	2-3 LF									
glufosinate	0.36	PREFL	0	98	91	85	0	98	91	90	95
Propanil (Super Wham) + Penetrator Plus (1 pt/A) + glufosinate <i>fb</i> propanil + Penetrator Plus (1 pt/A) + glufosinate	2.0 0.25 2.0 0.25	2-3 LF PREFL	0	98	88	85	0	100	91	86	95
Quinclorac + pendimethalin <i>fb</i> glufosinate	0.188 1.0 0.36	DPRE DPRE PREFL	19	0	93	86	0	0	94	93	95
Clomazone <i>fb</i> glufosinate	0.4 0.36	DPRE PREFL	40	0	85	64	0	0	85	86	95
Glufosinate <i>fb</i> glufosinate	0.36 0.36	2-3 LF POFL	0	98	81	79	0	100	88	91	95
Glufosinate	0.36	POFL	0	0	0	0	0	0	0	0	0
Glufosinate	0.72	POFL	0	0	0	0	0	0	0	0	0
LSD (0.05)			18	3	9	35	1	1	9	6	1

continued

Table 3. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Red rice (ORYSA)					Prickly sida (SIDSP)		
			5/25	6/11	6/18	6/25	7/7	8/3	6/18	6/25
			----- (%) -----							
Untreated check			0	0	0	0	0	0	0	0
Glufosinate	0.36	PREFL	0	0	90	74	53	13	79	29
Glufosinate	0.72	PREFL	0	0	90	85	63	50	83	63
Glufosinate	0.36	2-3 LF	0	79	88	83	66	71	83	64
Glufosinate <i>fb</i>	0.36	2-3 LF								
glufosinate	0.188	PREFL	0	73	91	84	65	45	65	56
Glufosinate <i>fb</i>	0.36	2-3 LF								
glufosinate	0.25	PREFL	0	79	95	95	89	75	94	88
Glufosinate <i>fb</i>	0.36	2-3 LF								
glufosinate	0.36	PREFL	0	83	95	98	89	95	95	85
Glufosinate <i>fb</i>	0.25	2-3 LF								
glufosinate	0.25	PREFL	0	66	91	90	84	89	91	85
Glufosinate <i>fb</i>	0.25	2-3 LF								
glufosinate	0.36	PREFL	0	68	93	93	88	90	93	89
Propanil (Super Wham) + Penetrator Plus (1 pt/A) + glufosinate <i>fb</i> propanil + Penetrator Plus (1 pt/A) + glufosinate	2.0 0.25 2.0 0.25	2-3 LF PREFL	0	90	94	95	88	96	94	88
Quinclorac + pendimethalin <i>fb</i> glufosinate	0.188 1.0 0.36	DPRE DPRE PREFL	20	0	91	80	53	25	96	88
Clomazone <i>fb</i> glufosinate	0.4 0.36	DPRE PREFL	41	0	88	75	50	13	93	65
Glufosinate <i>fb</i> glufosinate	0.36 0.36	2-3 LF POFL	0	81	85	80	69	93	75	73
Glufosinate	0.36	POFL	0	0	0	0	0	84	0	0
Glufosinate	0.72	POFL	0	0	0	0	0	91	0	0
LSD (0.05)			23	9	5	7	11	33	22	31

continued

Table 3. Section 3.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass	Rice injury				
			(ECHCG) control	Rice injury				
			7/7	5/25	6/11	6/18	6/25	7/7
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Glufosinate	0.36	PREFL	53	0	0	0	0	0
Glufosinate	0.72	PREFL	65	0	0	0	0	0
Glufosinate	0.36	2-3 LF	66	0	0	1	0	0
Glufosinate <i>fb</i>	0.36	2-3 LF						
glufosinate	0.188	PREFL	65	0	0	0	0	0
Glufosinate <i>fb</i>	0.36	2-3 LF						
glufosinate	0.25	PREFL	89	0	0	1	0	0
Glufosinate <i>fb</i>	0.36	2-3 LF						
glufosinate	0.36	PREFL	89	0	0	1	0	0
Glufosinate <i>fb</i>	0.25	2-3 LF						
glufosinate	0.25	PREFL	85	0	0	0	0	0
Glufosinate <i>fb</i>	0.25	2-3 LF						
glufosinate	0.36	PREFL	88	0	0	3	0	0
Propanil (Super Wham)	2.0							
+ Penetrator Plus								
(1 pt/A) +								
glufosinate <i>fb</i>	0.25	2-3 LF						
propanil +	2.0							
Penetrator Plus								
(1 pt/A) +								
glufosinate	0.25	PREFL	88	0	0	1	0	0
Quinclorac +	0.188							
pendimethalin <i>fb</i>	1.0	DPRE						
glufosinate	0.36	PREFL	53	0	0	1	0	0
Clomazone <i>fb</i>	0.4	DPRE						
glufosinate	0.36	PREFL	50	1	0	0	0	0
Glufosinate <i>fb</i>	0.36	2-3 LF						
glufosinate	0.36	POFL	69	0	0	0	0	0
Glufosinate	0.36	POFL	0	0	0	0	0	0
Glufosinate	0.72	POFL	0	0	0	0	0	0
LSD (0.05)			11	NS	NS	2	NS	NS

Table 4. Glufosinate (Liberty) aquatic weed control, Lonoke, 1999.**TEST INFORMATION**

Location	Lonoke	Planting date	no rice (fallow)
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	10 ft by 20 ft	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Row width / Number of rows per plot	7.5 in. / 14 rows	Date of flooding	June 18, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)			
% OM / pH	1.4 / 4.8		

Comments: PREFL = pre-flood; DRAIN = applied to weeds after draining first flood; and POFL = postflood.

Application type	PREFL	DRAIN	POFL
Date applied	6/4/99	6/29/99	7/8/99
Time	5:45 pm	3:35 pm	10:50 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	93 / 86	86 / 86	89 / 78
Relative humidity (%)	51	71	72
Wind (mph)	5	2	4
Weather	cloudy	cloudy	clear
Soil moisture	dry	dry	flooded
Crop stage/Height	N/A	N/A	N/A
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	18 / 6 / 20	18 / 6 / 20	26 / 6 / 20
Gpa / Psi	10 / 22	10 / 12	10 / 11
Weed species	----- [# leaves/height (in.)] -----		
MOLVE	4 lf / 1"	N/A	N/A
CYPCP	4 lf / 2"	N/A	adult / 25"
HETLI	N/A	6 lf / 3"	8 lf - flower / 3"

Conclusions: This study was conducted in a fallow (no rice) block to compare glufosinate (Liberty) and glyphosate (Roundup) for aquatic weed control. Propanil (Stam) and fenoxaprop + safener (Ricestar) were applied pre-flood to remove grass weeds. The block was flooded when the rice plots in the same bay were flooded, and aquatic weeds were allowed to develop. When a solid infestation of ducksalad emerged from the water (4-6" tall), the area was drained and glufosinate or glyphosate was applied to the "drained" plots. The plot area was re-flooded after a week and treatments were applied in the water to the "flooded" plots. Glufosinate "drained" burned back the ducksalad but it recovered. This is consistent with what had been seen in the past. Glyphosate "drained" provided excellent control. Neither herbicide provided control when applied to aquatic weeds in the flood.

Table 4.

Herbicide	Rate (lb/A)	Application timing	Weed control				
			Ducksalad (HELTI)		Yellow nutsedge (CYPES)	False- pimpernel (LINA)	Purple ammannia (AMMCO)
			7/12	8/2	8/2	8/2	8/2
Untreated check			0	0	0	0	0
Propanil at 4 lb/A + fenoxaprop/safener (Ricestar) at 0.08 lb/A was applied PREFL:							
Check [propanil + (fenoxaprop + safener)	4.0 0.08	PREFL	48	50	88	100	45
Glufosinate	0.36	DRAIN	53	50	83	100	50
Glufosinate	0.25	DRAIN	1	15	0	0	0
Glufosinate	0.25	POFL	1	10	0	0	0
Glyphosate	0.75	DRAIN	84	85	88	100	0
Glyphosate	0.75	POFL	1	0	15	25	0
LSD (0.05)			5	48	19	28	40

Table 5. Grass control with glufosinate (Liberty), Lonoke, 1999.**TEST INFORMATION**

Location	Lonoke	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 20, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Liberty Link
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.4 / 4.8		

Comments: PRE = preemergence; DPRE = delayed preemergence; 2-3 LF = 2-3 leaf rice; and PREFL = pre flood.

Application type	PRE	DPRE	2-3 LF	PREFL
Date applied	5/11/99	5/17/99	6/1/99	6/9/99
Time	4:20 pm	3:45 pm	11:30 pm	4:50 pm
Incorporation equipment	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	85 / 74	94 / 79	80 / 70	92 / 82
Relative humidity (%)	51	41	74	56
Wind (mph)	6	6	8	0
Weather	partly cloudy	partly cloudy	cloudy	cloudy
Soil moisture	moist	saturated	moist	moist
Crop stage/Height	N/A	N/A	2-3 lf / 3"	early tillering / 7"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	16 / 6 / 20	16 / 6 / 20	18 / 6 / 20	19 / 6 / 20
Gpa / Psi	10 / 21	10 / 23	10 / 18	10 / 24
Weed species	----- [# leaves/height (in.)]-----			
BRAPP	N/A	N/A	3-4 lf / 1.5"	N/A
R-ECHCG	N/A	N/A	3 lf / 2"	N/A
MOLVE	N/A	N/A	6 lf / 0"	1"
SEBEX	N/A	N/A	2-3 lf / 2.5"	N/A
AESVI	N/A	N/A	3 lf / 1.5"	N/A
CYPIR	N/A	N/A	N/A	5 lf / 2"

Conclusions: Glufosinate (Liberty) applied alone and in programs with other herbicides continues to provide outstanding broad-spectrum weed control. Yields were excellent.

Table 5. Section 1.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass (ECHCG) control								
			Resistant					Susceptible			
			5/26	6/16	6/29	7/12	8/2	6/16	6/29	7/12	8/2
Untreated check			0	0	0	0	0	0	0	0	25
Clomazone	0.4	PRE	81	100	83	86	79	100	85	88	85
Quinclorac	0.375	DPRE	100	100	100	95	100	100	100	95	100
Glufosinate	0.36	PREFL	0	53	90	91	84	53	90	91	91
Glufosinate	0.72	PREFL	0	56	100	95	99	56	100	95	100
Glufosinate	0.36	2-3 LF	0	71	85	95	86	64	85	79	74
Glufosinate <i>fb</i>	0.36	2-3 LF									
glufosinate	0.18	PREFL	0	95	100	95	100	98	100	95	100
Glufosinate <i>fb</i>	0.36	2-3 LF									
glufosinate	0.25	PREFL	0	90	100	95	100	93	100	95	100
Glufosinate <i>fb</i>	0.36	2-3 LF									
glufosinate	0.36	PREFL	0	96	100	95	100	100	100	95	100
Glufosinate <i>fb</i>	0.25	2-3 LF									
glufosinate	0.25	PREFL	0	89	100	95	100	100	100	95	100
Glufosinate <i>fb</i>	0.25	2-3 LF									
glufosinate	0.36	PREFL	0	88	100	95	100	93	100	95	100
Propanil (Super Wham) + Penetrator Plus (1 pt/A) <i>fb</i>	4.0	2-3 LF									
glufosinate	0.36	PREFL	0	73	100	95	100	93	100	95	100
Propanil + Penetrator Plus (1 pt/A) + glufosinate <i>fb</i>	2.0	2-3 LF									
propanil + Penetrator Plus (1 pt/A) + glufosinate	0.25	PREFL	0	98	100	95	100	100	100	95	100
Quinclorac + pendimethalin <i>fb</i>	0.188	DPRE									
glufosinate	1.0	PREFL	100	100	100	95	100	100	100	95	100
Clomazone <i>fb</i>	0.4	PRE									
glufosinate	0.36	PREFL	84	100	100	95	100	100	100	95	100
(Fenoxaprop + safener) <i>fb</i>	0.047	2-3 LF									
glufosinate	0.36	PREFL	0	91	100	95	100	99	100	95	100

continued

Table 5. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass (ECHCG) control								
			Resistant					Susceptible			
			5/26	6/16	6/29	7/12	8/2	6/16	6/29	7/12	8/2
			----- (%) -----								
Propanil + Penetrator Plus (1 pt/A) <i>fb</i> (fenoxaprop + safener)	4.0 0.047	2-3 LF PREFL	0	58	99	84	84	63	100	86	88
Quinclorac + Agri-Dex (1%)	0.375	2-3 LF	0	66	95	94	100	83	95	86	100
Glufosinate + quinclorac + Agri-Dex (1%)	0.36 0.25	2-3 LF	0	100	100	95	100	100	100	95	100
Quinclorac + pendimethalin <i>fb</i> propanil + Penetrator Plus (1 pt/A) + bensulfuron	0.188 1.0 3.0 0.062	DPRE PREFL	100	100	100	95	100	100	100	95	100
Clomazone <i>fb</i> propanil + Penetrator Plus (1 pt/A) + triclopyr	0.3 3.0 0.25	PRE PREFL	88	100	100	95	99	100	100	95	99
Quinclorac <i>fb</i> glufosinate <i>fb</i> glufosinate	0.25 0.36 0.36	DPRE 2-3 LF PREFL	100	100	100	95	100	100	100	95	100
LSD (0.05)			4	12	3	4	8	11	3	11	18

Table 5. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Entireleaf morninggloory	Northern jointvetch	Hemp sesbania	Rice flatsedge	Carpet- weed	Amazon sprangletop	
			Application (IPOHG) 5/26	(AESVI) 5/26	(SEBEX) 5/26 7/12	(CYPIR) 6/16	(MOLVE) 6/16	(LEFPA) 8/2	
Untreated check			0	0	0	0	0	0	0
Clomazone	0.4	PRE	24	0	0	68	0	0	100
Quinclorac	0.375	DPRE	100	51	50	95	93	50	100
Glufosinate	0.36	PREFL	0	0	0	95	53	100	100
Glufosinate	0.72	PREFL	0	0	0	95	61	93	100
Glufosinate	0.36	2-3 LF	0	0	0	93	55	88	100
Glufosinate <i>fb</i> glufosinate	0.36 0.18	2-3 LF PREFL	0 0	0 0	0 0	95 95	93 93	100 100	100 100
Glufosinate <i>fb</i> glufosinate	0.36 0.25	2-3 LF PREFL	0 0	0 0	0 0	95 95	93 93	100 100	100 100
Glufosinate <i>fb</i> glufosinate	0.36 0.36	2-3 LF PREFL	0 0	0 0	0 0	95 95	94 94	100 100	100 100
Glufosinate <i>fb</i> glufosinate	0.25 0.25	2-3 LF PREFL	0 0	0 0	0 0	95 95	96 96	100 100	100 100
Glufosinate <i>fb</i> glufosinate	0.25 0.36	2-3 LF PREFL	0 0	0 0	0 0	95 95	90 90	100 100	100 100
Propanil (Super Wham) + Penetrator Plus (1 pt/A) <i>fb</i> glufosinate	4.0	2-3 LF PREFL	0	0	0	95	100	100	100
Propanil + Penetrator Plus (1 pt/A) + glufosinate <i>fb</i> propanil + Penetrator Plus (1 pt/A) + glufosinate	2.0	2-3 LF PREFL	0	0	0	95	100	100	100
Quinclorac + pendimethalin <i>fb</i> glufosinate	0.188	DPRE PREFL	100	50	50	95	99	100	100
Clomazone <i>fb</i> glufosinate (fenoxaprop + safener) <i>fb</i> glufosinate	0.4 0.36 0.047 0.36	PRE PREFL 2-3 LF PREFL	23 0 0	0 0 0	0 0 0	95 95 95	48 48 65	73 73 95	100 100 100

continued

Table 5. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Entireleaf mornningglory	Northern jointvetch	Hemp sesbania	Rice flatsedge	Carpet- weed	Amazon sprangletop	
			(IPOHG) 5/26	(AESVI) 5/26	(SEBEX) 5/26 7/12	(CYPUR) 6/16	(MOLVE) 6/16	(LEFPA) 8/2	
Propanil + Penetrator Plus (1 pt/A) <i>fb</i> (fenoxaprop + safener)	4.0 0.047	2-3 LF PREFL	0	0	0	95	65	90	100
Quinclorac + Agri-Dex (1%)	0.375	2-3 LF	0	0	0	95	5	5	74
Glufosinate + quinclorac + Agri-Dex (1%)	0.36 0.25	2-3 LF	0	0	0	95	89	93	100
Quinclorac + pendimethalin <i>fb</i> propanil + Penetrator Plus (1 pt/A) + bensulfuron	0.188 1.0 3.0 0.062	DPRE PREFL	100	53	51	95	100	100	100
Clomazone <i>fb</i> propanil + Penetrator Plus (1 pt/A) + triclopyr	0.3 3.0 0.25	PRE PREFL	73	0	0	95	75	68	100
Quinclorac <i>fb</i> glufosinate <i>fb</i> glufosinate	0.25 0.36 0.36	DPRE 2-3 LF PREFL	100	28	25	95	100	100	100
LSD (0.05)			24	30	30	8	18	16	11

continued

Table 5. Section 3.

Herbicide	Rate (lb/A)	Application timing	Broadleaf signalgrass (BRAPP) control				Effect on rice			Yield 9/20 (lb/A)
			6/16	6/29	7/12	8/2	Injury			
			----- (%) -----				5/26	6/16	6/29	
Untreated check			0	0	0	0	0	0	0	2925
Clomazone	0.4	PRE	100	100	95	100	6	4	0	6840
Quinclorac	0.375	DPRE	100	100	95	100	6	11	6	8145
Glufosinate	0.36	PREFL	53	100	95	100	0	1	0	8910
Glufosinate	0.72	PREFL	56	100	95	100	0	6	0	9000
Glufosinate	0.36	2-3 LF	68	100	95	96	0	4	3	8910
Glufosinate <i>fb</i> glufosinate	0.36 0.18	2-3 LF PREFL	85	100	95	100	0	0	0	8955
Glufosinate <i>fb</i> glufosinate	0.36 0.25	2-3 LF PREFL	75	100	95	100	0	10	1	9450
Glufosinate <i>fb</i> glufosinate	0.36 0.36	2-3 LF PREFL	80	100	95	100	0	5	0	9225
Glufosinate <i>fb</i> glufosinate	0.25 0.25	2-3 LF PREFL	88	100	95	100	0	10	5	8100
Glufosinate <i>fb</i> glufosinate	0.25 0.36	2-3 LF PREFL	81	100	95	100	0	3	0	8280
Propanil (Super Wham) + Penetrator Plus (1 pt/A) <i>fb</i> glufosinate	4.0 0.36	2-3 LF PREFL	75	100	95	100	0	10	5	9315
Propanil + Penetrator Plus (1 pt/A) + glufosinate <i>fb</i> propanil + Penetrator Plus (1 pt/A) + glufosinate	2.0 0.25 2.0 0.25	 2-3 LF PREFL	74	100	95	100	0	14	9	8370
Quinclorac + pendimethalin <i>fb</i> glufosinate	0.188 1.0 0.25	 DPRE PREFL	100	100	95	100	11	19	10	8550
Clomazone <i>fb</i> glufosinate (fenoxaprop + safener) <i>fb</i> glufosinate	0.4 0.36 0.047 0.36	PRE PREFL 2-3 LF PREFL	88	100	95	100	5	1	3	8775
Propanil + Penetrator Plus (1 pt/A) <i>fb</i> (fenoxaprop + safener)	4.0 0.047	 2-3 LF PREFL	88	100	95	100	0	3	4	8685

continued

Table 5. Section 3. Continued.

Herbicide	Rate (lb/A)	Application timing	Broadleaf signalgrass (BRAPP) control				Effect on rice			Yield 9/20 (lb/A)
			6/16	6/29	7/12	8/2	Injury			
			----- (%) -----				5/26	6/16	6/29	
Quinclorac + Agri-Dex (1%)	0.375	2-3 LF	25	100	46	74	0	4	0	7515
Glufosinate + quinclorac + Agri-Dex (1%)	0.36 0.25	2-3 LF	100	100	95	100	0	3	0	7695
Quinclorac + pendimethalin <i>fb</i> propanil + Penetrator Plus (1 pt/A) + bensulfuron	0.188 1.0 3.0 0.062	DPRE DPRE	100	100	95	100	9	13	9	8280
Clomazone <i>fb</i> propanil + Penetrator Plus (1 pt/A) + triclopyr	0.3 3.0 0.25	PRE PRE	94	100	95	100	5	16	3	8415
Quinclorac <i>fb</i> glufosinate <i>fb</i> glufosinate	0.25 0.36 0.36	DPRE 2-3 LF PREFL	94	100	95	100	11	10	3	7920
LSD (0.05)			20	1	9	8	3	11	7	1395

Table 6. Effect of spray volume on glufosinate (Liberty) efficacy, Stuttgart, 1999.

TEST INFORMATION

Location	Stuttgart	Planting date	May 17, 1999
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	7 ft by 20 ft	Crop / Variety	Rice / Liberty
Row width / Number of rows per plot	7.5 in. / 9 rows	Dates of flushing	May 25, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	July 2, 1999
% OM / pH	1.4 / 4.8		

Comments: PREFL = pre flood; GPA = gallons per acre spray volume. Nozzle sizes for 5, 10, 15, and 20 GPA were 11067, 110015, 8002, and 8004, respectively, and pressure was 17 to 24 psi.

Application type	PREFL
Date applied	6/11/99
Time	11:00 am
Incorporation equipment	N/A
Air/Soil temperature (F)	88 / 82
Relative humidity (%)	63
Wind (mph)	0
Weather	clear
Soil moisture	dry
Crop stage/Height	early tillering / 9"
Sprayer type/mph	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / see Comments section
Boom ht / # Noz / Spacing (in.)	varied / 4 / 20
Gpa / Psi	5-20 / 17-24
Weed species	[(# leaves/height (in.))]
SEBEX	4 lf / 4-5"
ORYSA	1 tiller / 12"
IPOLA	N/A

Conclusions: The plot area was densely infested with red rice, barnyardgrass, morningglory, and hemp sesbania. An initial rate response was noted but little or no differences were noted among spray volumes.

Table 6. Section 1.

Herbicide (lb/A)	Rate	Application timing	Weed control						
			Hemp sesbania (SEBEX)			Red rice (ORYSA)			Prickly sida (SIDSP)
			6/18	6/25	7/7	6/18	6/25	7/7	6/18
			----- (%) -----						
Untreated check			0	0	0	0	0	0	0
5 GPA:									
Glufosinate	0.25	PREFL	89	88	95	74	70	54	93
Glufosinate	0.36	PREFL	93	88	94	88	65	63	93
Glufosinate	0.72	PREFL	91	90	84	90	72	70	93
10 GPA:									
Glufosinate	0.25	PREFL	89	65	95	74	43	53	90
Glufosinate	0.36	PREFL	89	88	95	85	63	55	93
Glufosinate	0.72	PREFL	91	88	95	85	78	71	95
15 GPA:									
Glufosinate	0.25	PREFL	89	88	95	81	64	54	93
Glufosinate	0.36	PREFL	89	84	95	84	64	61	94
Glufosinate	0.72	PREFL	94	85	95	93	60	73	95
20 GPA:									
Glufosinate	0.25	PREFL	91	81	95	80	54	53	94
Glufosinate	0.36	PREFL	88	91	95	74	56	53	94
Glufosinate	0.72	PREFL	94	84	95	91	71	71	95
LSD (0.05)			5	20	1	7	24	8	3

continued

Table 6. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control			Rice injury		
			Pitted morningglory (IPOLA)	Barnyardgrass (ECHCG)	6/18	6/25	7/7	
			6/25	7/7	----- (%) -----			
Untreated check			0	0	0	0	0	
5 GPA:								
Glufosinate	0.25	PREFL	91	54	0	0	0	
Glufosinate	0.36	PREFL	90	63	0	0	0	
Glufosinate	0.72	PREFL	93	70	0	0	0	
10 GPA:								
Glufosinate	0.25	PREFL	69	53	0	0	0	
Glufosinate	0.36	PREFL	93	55	0	0	0	
Glufosinate	0.72	PREFL	91	71	0	0	0	
15 GPA:								
Glufosinate	0.25	PREFL	90	54	0	0	0	
Glufosinate	0.36	PREFL	93	61	0	0	0	
Glufosinate	0.72	PREFL	91	73	0	0	0	
20 GPA:								
Glufosinate	0.25	PREFL	88	53	0	0	0	
Glufosinate	0.36	PREFL	90	53	0	0	0	
Glufosinate	0.72	PREFL	91	71	0	0	0	
LSD (0.05)			18	8	NS	NS	NS	

Table 7. Glufosinate (Liberty) flood timing study, Lonoke, 1999.**TEST INFORMATION**

Location	Lonoke	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 20, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Liberty Link
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.4 / 4.8		

Comments: PREFL = pre-flood.

Application type	PREFL
Date applied	6/18/99
Time	5:00 pm
Incorporation equipment	N/A
Air/Soil temperature (F)	78 / 80
Relative humidity (%)	40
Wind (mph)	1
Weather	clear
Soil moisture	dry
Crop stage/Height	1-2 tiller / 7"
Sprayer type/mph	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	19 / 6 / 20
Gpa / Psi	10 / 24
Weed species	[# leaves/height (in.)]
BRAPP	2-4 tiller / 6"
MOLVE	flowering / 1"
SEBEX	4 lf / 3"

Conclusions: Treatments were applied to all plots, and the permanent flood was applied 12, 24, or 48 hours after treatment to determine if flood timing would affect activity. All treatments performed comparably across flood timings.

Table 7.

Herbicide	Rate (lb/A)	Application timing	Broadleaf signalgrass (BRAPP) control			Effect on rice	
			6/29	7/12	8/2	Injury	Yield
			----- (%) -----			6/29	9/20
						(lb/A)	
Flooded 12 hours post-treatment							
Untreated check			0	0	0	0	2700
Glufosinate	0.25	PREFL	98	95	97	9	7965
Glufosinate	0.36	PREFL	100	95	100	5	8370
Glufosinate	0.72	PREFL	99	95	100	14	8235
Flooded 24 hours post-treatment							
Untreated check			0	0	0	0	2655
Glufosinate	0.25	PREFL	96	95	100	3	8010
Glufosinate	0.36	PREFL	95	95	100	3	8055
Glufosinate	0.72	PREFL	95	95	100	5	8550
Flooded 48 hours post-treatment							
Untreated check			0	0	0	0	1665
Glufosinate	0.25	PREFL	95	95	97	3	7560
Glufosinate	0.36	PREFL	94	95	100	3	7470
Glufosinate	0.72	PREFL	99	95	100	8	7830
LSD (0.05)			4	1	2	11	1035

Table 8. Multi-species weed control with imazethapyr in a simulated rice field, Lonoke, 1999.**TEST INFORMATION**

Location	Lonoke	Planting date	May 10, 1999
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	10 ft by 20 ft	Crop / Variety	no crop
Row width / Number of rows per plot	7.5 in. / rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.6 / 4.2		

Comments: PPI = preplant incorporated; PRE = preemergence; SPIKE = spiking; EPOST = early postemergence; and PREFL = pre-flood.

Application type	PPI	PRE	DPRE	EPOST	PREFL
Date applied	5/1/99	5/10/99	5/17/99	6/1/99	6/10/99
Time	10:40 am	3:10 pm	3:00 pm	9:25 am	1:20 pm
Incorporation	equipment	field cultivator	N/A	N/A	N/A N/A
Air/Soil temperature (F)	84 / 72	87 / 75	88 / 76	72 / 70	93 / 80
Relative humidity (%)	45	31	47	88	40
Wind (mph)	4	7	7	7	6
Weather	partly cloudy	clear	mostly cloudy	cloudy	clear
Soil moisture	dry	moist	saturated	moist	moist
Crop stage/Height	N/A	N/A	spiking	N/A	N/A
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	16 / 6 / 20	16 / 6 / 20	16 / 6 / 20	18 / 6 / 20	12 / 6 / 20
Gpa / Psi	10 / 19	10 / 19	10 / 23	10 / 18	10 / 23
Weed species	----- [# leaves/height (in.)] -----				
IPOLA	N/A	N/A	cotyledon / 1"	coty. - 1 lf / 1.5"	2-4 lf / 3"
IPOHG	N/A	N/A	cotyledon / 1"	coty. - 2 lf / 1.5"	2-4 lf / 3"
BRAPP	N/A	N/A	1 lf / 0.25"	2 lf / 0.5"	N/A
SIDSP	N/A	N/A	N/A	coty. - 2 lf / 0.5"	N/A
CASOB	N/A	N/A	N/A	coty. - 1 lf / 1.5"	N/A
AESVI	N/A	N/A	N/A	2-3 lf / 1.5"	6 lf / 4"
SEBEX	N/A	N/A	N/A	1 lf / 2"	6 lf / 5"
IPOWR	N/A	N/A	N/A	cotyledon / 1"	2-4 lf / 3"
MOLVE	N/A	N/A	N/A	2 lf / 0.125"	N/A
CYPCP	N/A	N/A	N/A	3 lf / 0.125"	N/A

Conclusions: This study was inadvertently placed in a low area of the field and most weed species had erratic stands. Control from most treatments was generally good except for hemp sesbania and northern jointvetch on which imazethapyr has no effect. Water hyssop and ducksalad control was better in this study with the higher rates and sequential applications.

Table 8. Section 1.

Herbicide	Rate	Application timing (lb/A)	Weed control						
			Broadleaf signalgrass (BRAPP)		Carpet-weed (MOLVE)	Hemp sesbania (SEBEX)		Northern jointvetch (AESVI)	
			6/15	7/12	6/15	6/15	7/12	6/15	7/12
Untreated check			0	0	0	0	0	0	0
Imazethapyr	0.063	PPI	100	94	90	5	0	8	0
Imazethapyr	0.094	PPI	100	100	95	0	0	0	0
Imazethapyr	0.125	PPI	100	100	96	0	3	0	5
Imazethapyr	0.063	PRE	93	95	66	0	0	0	0
Imazethapyr	0.094	PRE	95	100	78	8	3	15	5
Imazethapyr + Imazethapyr +	0.125 0.063	PRE	100	100	95	3	3	3	5
AG-98 (0.25%)		SPIKE	95	95	95	3	0	25	0
Imazethapyr + Imazethapyr	0.094 0.125	SPIKE	100	100	100	3	0	10	0
AG-98 (0.25%)		SPIKE	100	100	100	5	8	8	0
Imazethapyr + Imazethapyr +	0.063 0.094	EPOST	100	100	58	5	3	18	5
AG-98 (0.25%)		EPOST	100	100	60	5	14	28	23
Imazethapyr + Imazethapyr <i>fb</i>	0.125 0.063	EPOST	100	100	83	9	15	23	23
imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI							
AG-98 (0.25%)		PREFL	100	100	95	3	13	15	21
Imazethapyr <i>fb</i> imazethapyr +	0.063 0.063	PRE							
AG-98 (0.25%)		PREFL	100	100	91	10	20	30	33
LSD (0.05)			7	5	18	10	10	16	14

continued

Table 8. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Prickly sida (SIDSP) 6/15	Morningglory			Water- hyssop (BAOIN) 6/15	Duck- salad (HETLI) 6/15
				Palmleaf (IPOWR) 6/15	Pitted (IPOLA) 6/15	Entireleaf (IPOHG) 7/12		
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Imazethapyr	0.063	PPI	65	93	74	84	84	81
Imazethapyr	0.094	PPI	83	98	83	94	94	86
Imazethapyr	0.125	PPI	76	95	79	98	98	91
Imazethapyr	0.063	PRE	43	88	60	79	79	74
Imazethapyr	0.094	PRE	66	94	48	93	93	84
Imazethapyr	0.125	PRE	86	98	78	96	96	79
Imazethapyr + AG-98 (0.25%)	0.063	SPIKE	74	94	68	99	99	75
Imazethapyr + AG-98 (0.25%)	0.094	SPIKE	86	96	71	96	96	80
Imazethapyr + AG-98 (0.25%)	0.125	SPIKE	88	96	58	95	95	88
Imazethapyr + AG-98 (0.25%)	0.063	EPOST	43	88	65	96	96	84
Imazethapyr + AG-98 (0.25%)	0.094	EPOST	56	86	53	78	78	93
Imazethapyr + AG-98 (0.25%)	0.125	EPOST	73	95	71	90	90	93
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI PREFL	78	98	65	89	89	95
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PRE PREFL	64	99	56	73	73	94
LSD (0.05)			31	8	29	23	23	8

Table 9. Sequential applications in IMI-tolerant rice, Lonoke, 1999.

TEST INFORMATION

Location	Lonoke	Planting date	May 12, 1999
Experimental Design / replications	RCB / 4	Harvest date	August 18, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / 93AS3510
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.6 / 4.2		

Comments: Hemp sesbania was planted in rows across the plots. PPI = preplant incorporated; PRE = preemergence; DPRE = delayed preemergence; and PREFL = pre flood. IMI-rice = tolerant to the imidazolinone herbicide imazethapyr (Pursuit).

Application type	PPI	PRE	DPRE	PREFL
Date applied	5/12/99	5/12/99	5/18/99	6/16/99
Time	11:00 am	4:20 pm	2:25 pm	4:15 pm
Incorporation equipment	field cultivator	N/A	N/A	N/A
Air/Soil temperature (F)	70 / 68	81 / 76	94 / 75	92 / 80
Relative humidity (%)	82	49	29	26
Wind (mph)	7	5	2	7
Weather	partly cloudy	partly cloudy	clear	mostly clear
Soil moisture	dry	dry	saturated	moist
Crop stage/Height	N/A	N/A	N/A	2 tiller / 14"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	16 / 6 / 20	16 / 6 / 20	16 / 6 / 20	28 / 6 / 20
Gpa / Psi	10 / 19	10 / 19	10 / 19	10 / 23
Weed species	----- [# leaves/height (in.)] -----			
BRAPP	N/A	N/A	N/A	4 tiller / 7"
MOLVE	N/A	N/A	N/A	flowering / 3"
ECHCG	N/A	N/A	N/A	4 lf / 6"
SEBEX	N/A	N/A	N/A	4-5 lf / 8"

Conclusions: This study was initiated to compare several standard pre flood treatments applied alone and following a 0.063 rate of imazethapyr PPI, PRE, or DPRE. All sequential applications and tank mixes with imazethapyr performed equal to or better than the herbicide used alone. However, some crop injury was noted with imazethapyr PREFL applications. This injury tended to decrease yields.

Table 9. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control									
			Broadleaf signalgrass (BRAPP)			Carpet- weed (MOLVE)		Hemp sesbania (SEBEX)			Barnyard- grass (ECHCG)	
			6/4	7/12	7/27	6/4	6/4	7/12	7/27	7/12	7/27	
			----- (%) -----									
Untreated check			0	0	0	0	0	0	0	0	0	
Propanil (Super Wham) + Penetrator Plus (1 pt/A)	4.0	PREFL	0	100	100	0	0	100	100	58	0	
Propanil + quinclorac + Penetrator Plus (1 pt/A)	2.0 0.125	PREFL	0	86	100	0	0	100	100	68	35	
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	0	100	98	0	0	13	0	100	98	
Propanil + imazethapyr + Penetrator Plus (1 pt/A)	2.0 0.031	PREFL	0	100	100	0	0	100	100	100	90	
Propanil + triclopyr + Penetrator Plus (1 pt/A)	2.0 0.25	PREFL	0	60	63	0	0	100	100	38	0	
Propanil + carfentrazone + Penetrator Plus (1 pt/A)	2.0 0.02	PREFL	0	65	60	0	0	100	100	39	0	
Bispyribac-sodium + Kinetic (0.125%)	0.02	PREFL	0	46	19	0	0	100	100	94	100	
Imazethapyr	0.063	PPI	100	100	89	100	0	0	0	100	98	
Imazethapyr <i>fb</i> propanil + Penetrator Plus (1 pt/A)	0.063 4.0	PPI PREFL	100	100	100	100	0	100	100	100	95	
Imazethapyr <i>fb</i> propanil + quinclorac + Penetrator Plus (1 pt/A)	0.063 2.0 0.125	PPI PREFL	100	100	100	100	0	75	75	100	100	
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI PREFL	100	100	100	100	0	25	25	100	100	
Imazethapyr <i>fb</i> propanil + imazethapyr + Penetrator Plus (1 pt/A)	0.063 2.0 0.031	PPI PREFL	100	100	100	100	0	100	100	100	100	

continued

Table 9. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control										
			Broadleaf signalgrass (BRAPP)			Carpet- weed (MOLVE)			Hemp sesbania (SEBEX)			Barnyard- grass (ECHCG)	
			6/4	7/12	7/27	6/4	6/4	7/12	7/27	7/12	7/27		
			----- (%) -----										
Imazethapyr <i>fb</i>	0.063	PPI											
propanil +	2.0												
triclopyr +	0.25												
Penetrator Plus (1 pt/A)		PREFL	100	100	100	100	0	100	100	100	99		
Imazethapyr <i>fb</i>	0.063	PPI											
propanil +	2.0												
carfentrazone +	0.02												
Penetrator Plus (1 pt/A)		PREFL	100	100	100	100	0	100	100	100	98		
Imazethapyr <i>fb</i>	0.063	PPI											
bispyribac-sodium +	0.02												
Kinetic (0.125%)		PREFL	100	100	100	100	0	100	100	100	100		
Imazethapyr	0.063	PRE	100	98	85	100	0	0	0	98	94		
Imazethapyr <i>fb</i>	0.063	PRE											
propanil +	4.0												
Penetrator Plus (1 pt/A)		REFL	100	100	100	100	0	100	100	100	96		
Imazethapyr <i>fb</i>	0.063	PRE											
propanil +	2.0												
quinclorac +	0.125												
Penetrator Plus (1 pt/A)		PREFL	100	100	100	100	0	100	100	100	75		
Imazethapyr <i>fb</i>	0.063	PRE											
imazethapyr +	0.063												
AG-98 (0.25%)		PREFL	100	100	100	100	0	8	0	100	100		
Imazethapyr <i>fb</i>	0.063	PRE											
propanil +	2.0												
imazethapyr +	0.031												
Penetrator Plus (1 pt/A)		PREFL	100	100	100	100	0	100	100	100	99		
Imazethapyr <i>fb</i>	0.063	PRE											
propanil +	2.0												
triclopyr +	0.25												
Penetrator Plus (1 pt/A)		PREFL	100	100	100	100	0	100	100	100	98		
Imazethapyr <i>fb</i>	0.063	PRE											
propanil +	2.0												
carfentrazone +	0.02												
Penetrator Plus (1 pt/A)		PREFL	100	100	100	100	0	100	100	100	95		

continued

Table 9. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control									
			Broadleaf signalgrass (BRAPP)			Carpet- weed (MOLVE)	Hemp sesbania (SEBEX)			Barnyard- grass (ECHCG)		
			6/4	7/12	7/27	6/4	6/4	7/12	7/27	7/12	7/27	
			----- (%) -----									
Imazethapyr <i>fb</i>	0.063	PRE										
bispyribac-sodium + Kinetic (0.125%)	0.02	PREFL	100	100	100	100	0	100	100	100	100	
Imazethapyr	0.063	DPRE	100	100	100	100	0	0	0	100	100	
Imazethapyr <i>fb</i>	0.063	DPRE										
propanil + Penetrator Plus (1 pt/A)	4.0	PREFL	100	100	100	100	0	100	100	100	100	
Imazethapyr <i>fb</i>	0.063	DPRE										
propanil + quinclorac + Penetrator Plus (1 pt/A)	2.0 0.125	PREFL	100	100	100	100	0	100	100	100	100	
Imazethapyr <i>fb</i>	0.063	DPRE										
imazethapyr + AG-98 (0.25%)	0.063 0.063	PREFL	100	100	100	100	0	0	0	100	100	
Imazethapyr <i>fb</i>	0.063	DPRE										
propanil + imazethapyr + Penetrator Plus (1 pt/A)	2.0 0.031	PREFL	100	100	100	100	0	100	100	100	100	
Imazethapyr <i>fb</i>	0.063	DPRE										
propanil + triclopyr + Penetrator Plus (1 pt/A)	2.0 0.25	PREFL	100	100	100	100	0	100	100	100	100	
Imazethapyr <i>fb</i>	0.063	DPRE										
propanil + carfentrazone + Penetrator Plus (1 pt/A)	2.0 0.02	PREFL	100	100	100	100	0	100	100	100	98	
Imazethapyr <i>fb</i>	0.063	DPRE										
bispyribac-sodium + Kinetic (0.125%)	0.02	PREFL	100	100	100	100	0	75	75	100	100	
LSD (0.05)			1	15	17		1	NS	22	21	11	16

continued

Table 9. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control						Yield 8/18 (lb/A)
			Eclipta (ECLAL)		Amazon sprangletop (LEFPA)	Effect on rice			
			7/12	7/27	7/27	Injury			
			6/4	7/12	7/27				
			----- (%) -----						
Untreated check			0	0	0	0	0	0	2475
Propanil + Penetrator Plus (1 pt/A)	4.0	PREFL	100	100	95	0	0	0	4185
Propanil + quinclorac + Penetrator Plus (1 pt/A)	2.0 0.125	PREFL	100	100	75	0	0	0	3825
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	23	0	100	0	21	11	3510
Propanil + imazethapyr + Penetrator Plus (1 pt/A)	2.0 0.031	PREFL	100	90	100	0	10	3	4590
Propanil + triclopyr + Penetrator Plus (1 pt/A)	2.0 0.25	PREFL	100	100	98	0	0	0	3240
Propanil + carfentrazone + Penetrator Plus (1 pt/A)	2.0 0.02	PREFL	100	100	88	0	0	0	3240
Bispyribac-sodium + Kinetic (0.125%)	0.02	PREFL	100	100	30	0	0	0	3285
Imazethapyr	0.063	PPI	0	0	99	0	0	0	3015
Imazethapyr <i>fb</i> propanil + Penetrator Plus (1 pt/A)	0.063 4.0	PPI PREFL	100	100	100	0	0	1	4050
Imazethapyr <i>fb</i> propanil + quinclorac + Penetrator Plus (1 pt/A)	0.063 2.0 0.125	PPI PREFL	75	75	100	0	0	0	3870
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI PREFL	25	25	100	0	16	4	2970
Imazethapyr <i>fb</i> propanil + imazethapyr + Penetrator Plus (1 pt/A)	0.063 2.0 0.031	PPI PREFL	100	100	100	0	3	0	3915

continued

Table 9. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control						Yield 8/18 (lb/A)
			Eclipta (ECLAL)		Amazon sprangletop (LEFPA)	Effect on rice			
			7/12	7/27	7/27	Injury			
			6/4	7/12	7/27				
			----- (%) -----						
Imazethapyr <i>fb</i>	0.063	PPI							
propanil +	2.0								
triclopyr +	0.25								
Penetrator Plus (1 pt/A)		PREFL	100	100	100	0	1	0	4905
Imazethapyr <i>fb</i>	0.063	PPI							
propanil +	2.0								
carfentrazone +	0.02								
Penetrator Plus (1 pt/A)		PREFL	100	100	100	0	0	0	4410
Imazethapyr <i>fb</i>	0.063	PPI							
bispyribac-sodium +	0.02								
Kinetic (0.125%)		PREFL	100	100	100	0	3	0	4275
Imazethapyr	0.063	PRE	0	0	100	0	0	0	3195
Imazethapyr <i>fb</i>	0.063	PRE							
propanil +	4.0								
Penetrator Plus (1 pt/A)		PREFL	100	100	100	0	0	0	4545
Imazethapyr <i>fb</i>	0.063	PRE							
propanil +	2.0								
quinclorac +	0.125								
Penetrator Plus (1 pt/A)		PREFL	100	100	100	0	0	0	4320
Imazethapyr <i>fb</i>	0.063	PRE							
imazethapyr +	0.063								
AG-98 (0.25%)		PREFL	0	0	100	0	13	0	3330
Imazethapyr <i>fb</i>	0.063	PRE							
propanil +	2.0								
imazethapyr +	0.031								
Penetrator Plus (1 pt/A)		PREFL	100	100	100	0	3	0	4545
Imazethapyr <i>fb</i>	0.063	PRE							
propanil +	2.0								
triclopyr +	0.25								
Penetrator Plus (1 pt/A)		PREFL	100	100	100	0	0	0	4545
Imazethapyr <i>fb</i>	0.063	PRE							
propanil +	2.0								
carfentrazone +	0.02								
Penetrator Plus (1 pt/A)		PREFL	100	100	100	0	0	0	4275

continued

Table 9. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control						Yield 8/18 (lb/A)
			Eclipta (ECLAL)		Amazon sprangletop (LEFPA)	Effect on rice			
			7/12	7/27	7/27	Injury			
			6/4	7/12	7/27				
			----- (%) -----						
Imazethapyr <i>fb</i>	0.063	PRE							
bispyribac-sodium + Kinetic (0.125%)	0.02	PREFL	100	100	100	0	0	0	4545
Imazethapyr	0.063	DPRE	75	0	100	0	0	0	3780
Imazethapyr <i>fb</i>	0.063	DPRE							
propanil + Penetrator Plus (1 pt/A)	4.0	PREFL	100	100	100	0	0	0	3960
Imazethapyr <i>fb</i>	0.063	DPRE							
propanil + quinclorac + Penetrator Plus (1 pt/A)	2.0 0.125	PREFL	100	100	100	0	0	0	4455
Imazethapyr <i>fb</i>	0.063	DPRE							
imazethapyr + AG-98 (0.25%)	0.063 0.063	PREFL	0	25	100	0	13	0	2970
Imazethapyr <i>fb</i>	0.063	DPRE							
propanil + imazethapyr + Penetrator Plus (1 pt/A)	2.0 0.031	PREFL	100	100	100	0	1	0	4005
Imazethapyr <i>fb</i>	0.063	DPRE							
propanil + triclopyr + Penetrator Plus (1 pt/A)	2.0 0.25	PREFL	100	100	100	0	0	0	4185
Imazethapyr <i>fb</i>	0.063	DPRE							
propanil + carfentrazone + Penetrator Plus (1 pt/A)	2.0 0.02	PREFL	100	100	100	0	0	0	4410
Imazethapyr <i>fb</i>	0.063	DPRE							
bispyribac-sodium + Kinetic (0.125%)	0.02	PREFL	75	75	100	0	0	0	4185
LSD (0.05)			25	25	9	NS	4	2	765

Table 10. Preemergence tank mixes of imazethapyr with quinclorac and clomazone, Lonoke, 1999.**TEST INFORMATION**

Location	Lonoke	Planting date	May 12, 1999
Experimental Design / replications	RCB / 4	Harvest date	August 20, 1999
Plot size	10 ft by 20 ft	Crop / Variety	rice / 93A53510
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.6 / 4.2		

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

Application type	PPI	PRE	DPRE
Date applied	5/12/99	5/12/99	5/18/99
Time	12:10 pm	4:15 pm	1:10 pm
Incorporation equipment	field cultivator	N/A	N/A
Air/Soil temperature (F)	98 / 74	94 / 79	81 / 75
Relative humidity (%)	30	34	43
Wind (mph)	4	6	6
Weather	mostly clear	partly cloudy	clear
Soil moisture	dry	dry	saturated
Crop stage/Height	N/A	N/A	N/A
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	16 / 6 / 20	16 / 6 / 20	16 / 6 / 20
Gpa / Psi	10 / 19	10 / 19	10 / 19

Conclusions: This study was designed to evaluate the efficacy of soil-applied imazethapyr when tank-mixed with quinclorac (Facet) or clomazone (Command). Imazethapyr plus quinclorac provided better control of carpetweed, eclipta, and hemp sesbania, while imazethapyr plus clomazone provided better control of Amazon sprangletop either PPI, PRE, or DPRE. The tank mixes provided better control than each herbicide alone.

Table 10. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Broadleaf signalgrass (BRAPP)				Carpetweed (MOLVE)		Annual sedge (CYPCP)
			6/4	6/15	7/12	8/2	6/4	6/15	6/15
Untreated check			0	0	0	0	0	0	0
Imazethapyr	0.063	PPI	98	88	95	74	93	85	100
Imazethapyr	0.063	PRE	96	84	93	56	94	84	100
Imazethapyr	0.063	DPRE	96	88	100	81	100	95	100
Clomazone	0.4	PPI	100	98	100	88	0	5	0
Clomazone	0.4	PRE	100	88	100	49	0	0	0
Clomazone	0.4	DPRE	98	94	100	68	0	18	0
Quinclorac	0.375	PPI	100	100	100	98	0	64	90
Quinclorac	0.375	PRE	100	98	100	93	0	64	100
Quinclorac	0.375	DPRE	100	99	100	95	100	90	100
Imazethapyr + clomazone	0.063 0.3	PPI	99	98	100	81	94	79	100
Imazethapyr + clomazone	0.063 0.3	PRE	100	95	100	80	88	79	100
Imazethapyr + clomazone	0.063 0.3	DPRE	100	98	100	88	100	99	100
Imazethapyr + clomazone	0.047 0.3	PPI	98	96	100	95	90	78	100
Imazethapyr + clomazone	0.047 0.3	PRE	100	85	100	71	88	78	98
Imazethapyr + clomazone	0.047 0.3	DPRE	98	96	100	89	100	99	100
Imazethapyr + quinclorac	0.063 0.188	PPI	100	95	100	86	98	91	100
Imazethapyr + quinclorac	0.063 0.188	PRE	100	89	100	30	100	93	98
Imazethapyr + quinclorac	0.063 0.188	DPRE	100	98	100	86	100	98	100
Imazethapyr + quinclorac	0.047 0.188	PPI	99	95	100	78	96	94	100
Imazethapyr + quinclorac	0.047 0.188	PRE	100	89	100	68	98	89	100
Imazethapyr + quinclorac	0.047 0.188	DPRE	100	96	100	83	100	99	100
Clomazone + quinclorac	0.3 0.188	PPI	100	98	100	83	0	54	85

continued

Table 10. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Broadleaf signalgrass (BRAPP)				Carpetweed (MOLVE)		Annual sedge (CYPCP)
			6/4	6/15	7/12	8/2	6/4	6/15	6/15
			----- (%) -----						
Clomazone + quinclorac	0.3 0.188	PRE	100	93	100	74	0	38	75
Clomazone + quinclorac	0.3 0.188	DPRE	100	98	100	91	83	70	100
Imazethapyr + thiobencarb	0.063 3.0	DPRE	100	95	100	85	100	100	100
LSD (0.05)			3	8	4	27	9	16	6

continued

Table 10. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Barnyardgrass (ECHCG)			Eclipta (ECLAL)		Amazon sprangletop (LEFPA)	
			Resistant		Susc.				
			6/15	7/12	8/2	7/12	8/2	7/12	8/2
----- (%) -----									
Untreated check			0	0	0	0	0	0	0
Imazethapyr	0.063	PPI	88	99	78	45	0	79	25
Imazethapyr	0.063	PRE	86	88	73	0	0	73	10
Imazethapyr	0.063	DPRE	89	96	80	70	48	95	90
Clomazone	0.4	PPI	96	91	30	45	0	79	86
Clomazone	0.4	PRE	81	40	10	45	25	20	65
Clomazone	0.4	DPRE	98	81	33	50	75	79	91
Quinclorac	0.375	PPI	91	85	80	100	100	0	0
Quinclorac	0.375	PRE	94	100	75	100	100	23	0
Quinclorac	0.375	DPRE	100	100	98	100	100	68	41
Imazethapyr + clomazone	0.063 0.3	PPI	99	95	86	65	0	91	78
Imazethapyr + clomazone	0.063 0.3	PRE	94	99	80	58	0	89	74
Imazethapyr + clomazone	0.063 0.3	DPRE	99	100	88	75	25	100	98
Imazethapyr + clomazone	0.047 0.3	PPI	91	96	88	50	23	94	90

continued

Table 10. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Barnyardgrass (ECHCG)			Eclipta (ECLAL)		Amazon sprangletop (LEFPA)	
			Resistant		Susc.				
			6/15	7/12	8/2	7/12	8/2	7/12	8/2
			----- (%) -----						
Imazethapyr + clomazone	0.047 0.3	PRE	98	99	73	45	0	91	85
Imazethapyr + clomazone	0.047 0.3	DPRE	96	100	90	85	25	100	93
Imazethapyr + quinclorac	0.063 0.188	PPI	94	95	90	100	100	81	45
Imazethapyr + quinclorac	0.063 0.188	PRE	89	98	73	100	100	69	8
Imazethapyr + quinclorac	0.063 0.188	DPRE	100	99	88	100	100	96	88
Imazethapyr + quinclorac	0.047 0.188	PPI	86	100	85	100	100	79	36
Imazethapyr + quinclorac	0.047 0.188	PRE	85	100	75	100	100	71	38
Imazethapyr + quinclorac	0.047 0.188	DPRE	96	98	93	100	100	94	83
Clomazone + quinclorac	0.3 0.188	PPI	99	88	53	100	100	74	54
Clomazone + quinclorac	0.3 0.188	PRE	96	93	66	100	100	80	54
Clomazone + quinclorac	0.3 0.188	DPRE	100	100	91	100	100	95	88
Imazethapyr + thiobencarb	0.063 3.0	DPRE	99	100	95	100	100	98	95
LSD (0.05)			7	16	23	43	34	18	32

continued

Table 10. Section 3.

Herbicide	Rate (lb/A)	Application timing	Hemp sesbania	Effect on rice				Yield 8/20 (lb/A)
			(SEBEX) control	Injury				
			8/2	6/4	6/15	7/12	8/2	
			----- (%) -----					
Untreated check			0	0	0	0	0	2475
Imazethapyr	0.063	PPI	0	0	0	0	0	4140
Imazethapyr	0.063	PRE	23	0	0	3	0	3465

continued

Table 10. Section 3. Continued.

Herbicide	Rate (lb/A)	Application timing	Hemp sesbania	Effect on rice				Yield 8/20 (lb/A)
			(SEBEX) control	Injury				
			8/2	6/4	6/15	7/12	8/2	
				----- (%) -----				
Imazethapyr	0.063	DPRE	43	0	0	0	0	4590
Clomazone	0.4	PPI	45	13	9	8	10	4275
Clomazone	0.4	PRE	45	0	0	0	0	3690
Clomazone	0.4	DPRE	73	0	0	0	0	4680
Quinclorac	0.375	PPI	100	0	0	0	0	2970
Quinclorac	0.375	PRE	100	0	0	0	0	3555
Quinclorac	0.375	DPRE	100	0	0	5	0	4680
Imazethapyr + clomazone	0.063 0.3	PPI	46	4	30	0	0	4950
Imazethapyr + clomazone	0.063 0.3	PRE	45	0	0	0	0	4320
Imazethapyr + clomazone	0.063 0.3	DPRE	25	0	4	3	0	4455
Imazethapyr + clomazone	0.047 0.3	PPI	40	6	0	0	0	4185
Imazethapyr + clomazone	0.047 0.3	PRE	0	0	0	0	0	4365
Imazethapyr + clomazone	0.047 0.3	DPRE	75	0	0	0	0	4725
Imazethapyr + quinclorac	0.063 0.188	PPI	100	0	0	0	0	4680
Imazethapyr + quinclorac	0.063 0.188	PRE	100	0	0	0	0	4680
Imazethapyr + quinclorac	0.063 0.188	DPRE	100	0	0	0	0	5130
Imazethapyr + quinclorac	0.047 0.188	PPI	100	0	0	0	0	4860
Imazethapyr + quinclorac	0.047 0.188	PRE	100	0	0	0	0	4185
Imazethapyr + quinclorac	0.047 0.188	DPRE	100	0	0	0	0	5085
Clomazone + quinclorac	0.3 0.188	PPI	100	4	0	0	0	4500
Clomazone + quinclorac	0.3 0.188	PRE	100	0	0	0	0	4500
Clomazone + quinclorac	0.3 0.188	DPRE	100	0	0	0	0	4860
Imazethapyr + thiobencarb	0.063 3.0	DPRE	100	0	0	3	0	4815
LSD (0.05)			45	3	3	4	0	810

Table 11. Imazethapyr (Pursuit) follow-crop study - rice followed by wheat and non-IMI rice, Lonoke, 1998-1999.

TEST INFORMATION

Location	Lonoke	Planting date	May 1, 1998 and May 14, 1999
Experimental Design / replications	RCB / 4	Harvest date	August 10, 1998 and September 20, 1999
Plot size	20 ft by 20 ft	Crop / Variety	Rice / 93AS3510 (1998) and Drew (1999)
Row width / Number of rows per plot	7.5 in. / 28 rows	Dates of flushing	May 7, 14, and 20, 1998
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		May 13, 14, 21, 22, and June 8, 1999
% OM / pH	1.6 / 4.2	Date of flooding	June 2, 1998 and June 18, 1999

Comments: PPI = preplant incorporated; PPL = preplant; PRE = preemergence; DPRE = delayed preemergence; POST = postemergence; EPOST = early postemergence; PREFL = pre-flood; and POFL = post flood; IMI-tolerant = tolerant to the imidazolinone herbicide imazethapyr (Pursuit). Plots (20 ft wide) were planted to rice and sprayed with imazethapyr in 1998. Plots were divided, and wheat and oats were planted in a 5-ft strip in each plot in the fall of 1998 and were harvested June 1, 1999. Drew rice (non-IMI-tolerant) was planted in the remaining 10 ft of each plot in 1999 and was sprayed with standard rice herbicides (glyphosate, 0.75 lb/A on April 13 and paraquat, 0.63 lb/A on May 14 for burndown of winter weeds; propanil, 4 lb/A + quinclorac, 0.375 lb/A on May 28).

1998 TREATMENT APPLICATION DATA

Application type	PPI	PRE	DPRE	EPOST	PREFL	POFL
Date applied	5/1/98	5/2/98	5/4/98	5/18/98	6/1/98	6/8/98
Time	11:30 am	2:05 pm	4:05 pm	4:30 pm	11:00 am	11:55 am
Incorporation equipment	field cultivator	N/A	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	72 / 68	78 / 80 / 75	84 / 84	98 / 86	87 / 88	81 / 74
Relative humidity (%)	52	49	41	40	57	78
Wind (mph)	5	4	2	5	2	5
Weather	cloudy	cloudy	mostly clear	mostly clear	mostly clear	cloudy
Soil moisture	moist	moist	moist	moist	moist	flooded
Crop stage/Height	N/A	N/A	N/A	3 lf / 4"	3 lf / 8"	2 tiller / 13"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	18 / 6 / 20	18 / 6 / 20	18 / 6 / 20	19 / 6 / 20	26 / 6 / 20	28 / 6 / 20
Gpa / Psi	10 / 21	10 / 21	10 / 21	10 / 20	10 / 20	10 / 19
Weed species	----- [# leaves/height (in.)] -----					
BRAPP	N/A	N/A	N/A	3 lf / 2"	2 tiller / 6"	tillered / 13"
CYPIR	N/A	N/A	N/A	2-3 lf / 1"	3-4 lf / 2"	N/A
MOLVE	N/A	N/A	N/A	4 lf / 0.125"	N/A	N/A

1999 TREATMENT APPLICATION DATA

	PPL	PRE	POST
Application type	PPL	PRE	POST
Date applied	4/13/99	5/14/99	5/28/99
Time	11:00 am	9:45 am	10:25 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	70 / 62	69 / 64	78 / 70
Relative humidity (%)	53	42	48
Wind (mph)	4	2	0
Weather	cloudy	mostly clear	partly cloudy
Soil moisture	moist	dry	dry
Crop stage/Height	N/A	N/A	2-3 lf / 4"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	22 / 6 / 20	15 / 6 / 20	16 / 6 / 20
Gpa / Psi	10 / 12	10 / 20	10 / 7
Weed species	----- [# leaves/height (in.)] -----		
RANBU	bloom / 8"	N/A	N/A
OEOLA	early bloom / 6"	blooming / 4"	N/A
GERCA	bloom / 6"	N/A	N/A
ERICA	late tillering / 8"	12 lf / 3"	N/A
BRAPP	N/A	3-4 lf / 3"	3-4 lf / 4"

Conclusions: This is a report from the study established in 1998 to determine if residues from imazethapyr in rice would have any adverse effect on rotational winter crops or on non-IMI tolerant rice the following season. Three rates of imazethapyr were used at various application timings. No injury was noted from any of the treatments in wheat or oat plots. Yields of wheat and oats were not uniform due to stand reduction in wet areas of the trial. Rice was planted in 1999. No injury symptoms from carryover were noted throughout the season, and yields were uniform.

Table 11. Section 1.

Herbicide	Rate	Application timing (lb/A)	Broadleaf signalgrass (BRAPP) control - 1998				
			5/15	5/27	6/16	7/6	7/27
			----- (%) -----				
Imazethapyr applied in 1998 only:							
Untreated check			0	0	0	0	0
Imazethapyr	0.063	PPI	86	90	100	100	85
Imazethapyr	0.125	PPI	91	99	100	100	100
Imazethapyr	0.063	PRE	84	81	100	100	85
Imazethapyr	0.125	PRE	91	93	100	100	100
Imazethapyr	0.063	DPRE	75	84	100	100	95
Imazethapyr	0.125	DPRE	84	94	100	100	99
Imazethapyr + AG-98 (0.25%)	0.063	EPOST	0	69	100	100	98
Imazethapyr + AG-98 (0.25%)	0.125	EPOST	0	75	100	100	100
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	0	0	76	30	39
Imazethapyr + AG-98 (0.25%)	0.125	PREFL	0	0	79	48	51
Imazethapyr + AG-98 (0.25%)	0.125	POFL	0	0	31	50	38
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI PREFL					
			88	94	100	100	100
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.125 0.125	PRE PREFL					
			94	96	100	100	100
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.03	DPRE PREFL					
			84	86	100	100	100
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.125 0.125	DPRE PREFL					
			86	95	100	100	100
LSD (0.05)			6	8	8	12	15

continued

Table 11. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control - 1998				
			Rice flatsedge (CYPIR)		Carpet- weed (MOLVE)	Barnyard- grass (ECHCG)	Eclipta (ECLAL)
			5/15	5/27	5/27	7/6	7/6
			----- (%) -----				
Imazethapyr applied in 1998 only:							
Untreated check			0	0	0	0	0
Imazethapyr	0.063	PPI	100	100	0	100	85
Imazethapyr	0.125	PPI	100	100	0	100	100
Imazethapyr	0.063	PRE	100	100	0	100	85
Imazethapyr	0.125	PRE	100	100	0	100	96
Imazethapyr	0.063	DPRE	100	100	0	100	100
Imazethapyr	0.125	DPRE	100	100	0	100	100
Imazethapyr + AG-98 (0.25%)	0.063	EPOST	0	81	5	100	0
Imazethapyr + AG-98 (0.25%)	0.125	EPOST	0	89	0	100	58
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	0	0	0	53	35
Imazethapyr + AG-98 (0.25%)	0.125	PREFL	0	0	0	55	45
Imazethapyr + AG-98 (0.25%)	0.125	POFL	0	0	0	53	13
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI PREFL	100 100	100 100	0 0	100 100	90
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.125 0.125	PRE PREFL	100 100	100 100	0 0	100 100	94
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.03	DPRE PREFL	100 100	100 100	0 0	100 100	85
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.125 0.125	DPRE PREFL	100 100	100 100	0 0	100 100	100
LSD (0.05)			1	3	4	15	26

continued

Table 11. Section 3.

Herbicide	Rate (lb/A)	Application timing	Rice	Rice injury - 1998 and 1999						
			heading	1998					1999	
			(1998)	5/15	5/27	6/16	7/6	7/27	6/17	7/12
			7/6	----- (%) -----						
Imazethapyr applied in 1998 only:										
Untreated check			34	0	0	0	0	0	5	1
Imazethapyr	0.063	PPI	66	0	4	5	4	0	6	1
Imazethapyr	0.125	PPI	53	1	6	8	8	0	5	3
Imazethapyr	0.063	PRE	69	0	0	5	3	0	4	4
Imazethapyr	0.125	PRE	54	3	5	16	13	0	5	1
Imazethapyr	0.063	DPRE	81	0	0	0	0	0	5	1
Imazethapyr	0.125	DPRE	55	1	3	6	9	0	5	4
Imazethapyr + AG-98 (0.25%)	0.063	EPOST	34	0	25	19	16	0	0	0
Imazethapyr + AG-98 (0.25%)	0.125	EPOST	14	0	25	30	28	0	5	3
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	13	0	0	18	35	0	6	0
Imazethapyr + AG-98 (0.25%)	0.125	PREFL	11	0	0	28	43	0	6	4
Imazethapyr + AG-98 (0.25%)	0.125	POFL	14	0	0	5	45	0	9	0
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI PREFL	59	0	0	10	9	0	8	0
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.125 0.125	PRE PREFL	41	5	3	25	18	0	10	1
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.03	DPRE PREFL	64	3	0	0	0	0	9	3
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.125 0.125	DPRE PREFL	41	0	5	14	15	0	9	5
LSD (0.05)			24	3	5	14	18	NS	9	5

continued

Table 11. Section 4.

Herbicide	Rate (lb/A)	Application timing	Rotational crops –1999						Rice yield	
			Wheat		Oat		Wheat	Oat	IMI	Convent.
			injury		injury		yield	yield	8/10/98	9/20/99
			4/29	5/13	4/29	5/13	6/1	6/1	(lb/A)	(lb/A)
		----- (%) -----		-----		---- (bu/A) ----	----- (lb/A) -----			
Imazethapyr applied in 1998 only:										
Untreated check			0	14	15	23	49	52	1170	6750
Imazethapyr	0.063	PPI	3	11	18	31	53	58	4005	6750
Imazethapyr	0.125	PPI	8	20	20	29	45	50	4230	7110
Imazethapyr	0.063	PRE	5	16	25	33	50	49	4005	6930
Imazethapyr	0.125	PRE	0	8	23	25	57	61	3960	6705
Imazethapyr	0.063	DPRE	5	20	28	40	47	40	4410	7155
Imazethapyr	0.125	DPRE	0	11	20	30	45	51	3915	6795
Imazethapyr + AG-98 (0.25%)	0.063	EPOST	0	8	5	9	56	79	3870	6795
Imazethapyr + AG-98 (0.25%)	0.125	EPOST	0	18	15	26	49	62	4050	6885
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	0	5	8	23	50	66	2790	6885
Imazethapyr + AG-98 (0.25%)	0.125	PREFL	0	8	24	34	59	56	3015	6840
Imazethapyr + AG-98 (0.25%)	0.125	POFL	3	21	13	20	49	61	2115	6840
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI PREFL	10	26	25	38	47	48	3870	6705
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.125 0.125	PRE PREFL	0	24	10	24	48	64	3555	6840
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.03	DPRE PREFL	5	10	20	30	52	58	3690	7020
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.125 0.125	DPRE PREFL	8	25	10	34	51	55	4320	7110
LSD (0.05)			NS	NS	NS	NS	11	27	765	NS

Table 12. Imazethapyr follow-crop study - rice followed by wheat and non-IMI rice (Year 1), Lonoke, 1999.

TEST INFORMATION

Location	Lonoke	Planting date	May 10, 1999
Experimental Design / replications	RCB / 4	Harvest date	August 16, 1999
Plot size	20 ft by 20 ft	Crop / Variety	Rice / 93AS3510
Row width / Number of rows per plot	7.5 in. / 28 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.6 / 4.2		

Comments: PPI = preplant incorporated; PRE = preemergence; SPIKE = spiking; EPOST = early postemergence; PREFL = pre-flood; and POFL = postflood; IMI-tolerant = tolerant to the imidazolinone herbicide imazethapyr (Pursuit).

Application type	PPI	PRE	SPIKE	EPOST	PREFL	POFL
Date applied	5/10/99	5/10/99	5/17/99	5/27/99	6/10/99	6/21/99
Time	10:00 am	2:55 pm	2:10 pm	10:00 am	1:20 pm	2:45 pm
Incorporation	equipment	field cultivator	N/A	N/A	N/A	N/A
N/A						
Air/Soil temperature (F)	82 / 69	88 / 75	88 / 76	74 / 65	93 / 82	93 / 80
Relative humidity (%)	65	33	52	57	40	32
Wind (mph)	4		7	3	6	0
Weather	partly cloudy	partly cloudy	partly cloudy	clear	clear	clear
Soil moisture	dry	moist	saturated	moist	saturated	flooded
Crop stage/Height	N/A	N/A	spiking / 0.25"	2-3 lf / 3.5"	early tillering / 10"	2 tiller / 15"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	16 / 6 / 20	16 / 6 / 20	16 / 6 / 20	18 / 6 / 20	22 / 6 / 20	25 / 6 / 20
Gpa / Psi	10 / 19	10 / 19	10 / 23	10 / 18	10 / 23	10 / 21
Weed species	----- [# leaves/height (in.)] -----					
BRAPP	N/A	N/A	1 lf / 0.5"	1-2 lf / 0.5"	6-7 lf / 4"	4 tiller / 11"
MOLVE	N/A	N/A	N/A	2 lf / 0.25"	flowering / 1"	N/A
IPOHG	N/A	N/A	N/A	N/A	N/A	1 runner / 7"

Conclusions: This 1999 study is the first year of a repeat of the 1998 follow-crop study. Weed control ratings and yields are shown for the various imazethapyr treatments applied to the IMI-tolerant rice.

Table 12. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Broadleaf signalgrass (BRAPP)				Carpetweed (MOLVE)	Barnyardgrass (ECHCG)
			5/26	6/15	7/12	8/2	6/15	7/12
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Imazethapyr <i>fb</i>	0.063	PPI						
imazethapyr + AG-98 (0.25%)	0.063	PREFL	99	98	100	100	96	100
Imazethapyr	0.125	PPI	99	98	100	93	95	100
Imazethapyr	0.063	PRE	99	80	98	70	83	100
Imazethapyr	0.125	PRE	99	100	100	98	99	100
Imazethapyr + AG-98 (0.25%)	0.063	SPIKE	100	88	100	78	93	100
Imazethapyr + AG-98 (0.25%)	0.125	SPIKE	99	99	100	96	98	100
Imazethapyr + AG-98 (0.25%)	0.063	EPOST	99	98	100	98	78	100
Imazethapyr + AG-98 (0.25%)	0.125	EPOST	90	93	100	100	83	100
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	93	33	98	89	30	100
Imazethapyr + AG-98 (0.25%)	0.125	PREFL	80	15	100	95	15	100
Imazethapyr + AG-98 (0.25%)	0.125	POFL	83	0	100	59	0	100
Imazethapyr <i>fb</i>	0.063	EPOST						
imazethapyr + AG-98 (0.25%)	0.063	PREFL	95	98	100	100	86	100
Imazethapyr <i>fb</i>	0.125	PRE						
imazethapyr + AG-98 (0.25%)	0.125	PREFL	100	100	100	100	98	100
Imazethapyr + AG-98 (0.25%) <i>fb</i>	0.063	SPIKE						
imazethapyr + AG-98 (0.25%)	0.063	PREFL	98	100	100	100	99	100
Imazethapyr + AG-98 (0.25%) <i>fb</i>	0.125	SPIKE						
imazethapyr + AG-98 (0.25%)	0.125	PREFL	100	100	100	100	100	100
LSD (0.05)			10	11	2	12	13	0

continued

Table 12. Section 2.

Herbicide	Rate (lb/A)	Application timing	Eclipta (ECLAL)		Effect on rice				Yield 8/16 (lb/A)
			control		Injury				
			7/12	8/2	5/26	6/15	7/12	8/2	
Untreated check			0	0	0	0	0	0	3015
Imazethapyr <i>fb</i>	0.063	PPI							
imazethapyr + AG-98 (0.25%)	0.063	PREFL	48	45	0	0	0	0	3960
Imazethapyr	0.125	PPI	48	78	0	0	0	0	4230
Imazethapyr	0.063	PRE	18	30	0	0	1	0	3645
Imazethapyr	0.125	PRE	93	85	0	0	5	0	3870
Imazethapyr + AG-98 (0.25%)	0.063	SPIKE	68	45	0	0	4	0	3510
Imazethapyr + AG-98 (0.25%)	0.125	SPIKE	95	88	0	1	8	0	4320
Imazethapyr + AG-98 (0.25%)	0.063	EPOST	90	68	18	1	6	0	4140
Imazethapyr + AG-98 (0.25%)	0.125	EPOST	85	85	3	6	10	0	4230
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	70	75	0	6	3	1	3735
Imazethapyr + AG-98 (0.25%)	0.125	PREFL	44	25	0	4	9	0	4500
Imazethapyr + AG-98 (0.25%)	0.125	POFL	0	0	0	0	26	9	3825
Imazethapyr <i>fb</i>	0.063	EPOST							
imazethapyr + AG-98 (0.25%)	0.063	PREFL	98	93	0	5	6	0	3600
Imazethapyr <i>fb</i>	0.125	PRE							
imazethapyr + AG-98 (0.25%)	0.125	PREFL	99	95	0	5	13	1	3645
Imazethapyr + AG-98 (0.25%) <i>fb</i>	0.063	SPIKE							
imazethapyr + AG-98 (0.25%)	0.063	PREFL	100	100	10	6	9	0	3825
Imazethapyr + AG-98 (0.25%) <i>fb</i>	0.125	SPIKE							
imazethapyr + AG-98 (0.25%)	0.125	PREFL	100	100	26	20	19	5	4140
LSD (0.05)			37	42	5	6	5	1	585

Table 13. Tank-mix combinations with imazethapyr, Lonoke, 1999.**TEST INFORMATION**

Location	Lonoke	Planting date	May 12, 1999
Experimental Design / replications	RCB / 4	Harvest date	August 18, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / 93AS3510
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.4 / 4.8		

Comments: EPOST = early postemergence.

Application type	EPOST
Date applied	6/2/99
Time	9:25 am
Incorporation equipment	N/A
Air/Soil temperature (F)	84 / 76
Relative humidity (%)	73
Wind (mph)	0
Weather	clear
Soil moisture	saturated
Crop stage/Height	3 lf / 5"
Sprayer type/mph	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	19 / 3 / 20
Gpa / Psi	10 / 18
Weed species	[# leaves/height (in.)]
BRAPP	2 lf / 1"
MOLVE	4 lf / 0.25"
CYPCP	3 lf / 1"
SEBEX	1 lf / 1"

Conclusions: No antagonism was noted with any of the tank mixtures. Therefore, the herbicides with good broadleaf/legume control provided excellent control of hemp sesbania when mixed with imazethapyr. Both propanil-resistant and -susceptible barnyardgrass were present, so control of the total barnyardgrass population was better when propanil-formulated herbicides were mixed with imazethapyr than when applied alone. Crop injury was excessive from all imazethapyr treatments early in the season, although injury with the tank mix of quinclorac was only 20%.

Table 13. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Broadleaf signalgrass (BRAPP)			Carpetweed (MOLVE)	Hemp sesbania (SEBEX)	
			6/4	6/15	7/12	6/4	7/12	7/27
			----- (%) -----					
Untreated check			0	0	0	0	0	25
Propanil (Stam M-4) + AG-98 (0.25%)	3.0	EPOST	100	100	100	100	98	100
Halosulfuron + AG-98 (0.25%)	0.047	EPOST	64	36	13	76	100	100
(Propanil + molinate)	4.5	EPOST	100	100	100	100	98	100
Propanil (Super Wham) + Penetrator Plus (1 pt/A)	3.0	EPOST	100	100	100	100	99	100
Triclopyr + AG-98 (0.25%)	0.25	EPOST	30	0	0	98	100	100
Bensulfuron + AG-98 (0.25%)	0.125	EPOST	61	58	0	100	98	100
Thiobencarb	3.0	EPOST	54	13	0	89	88	90
Carfentrazone	0.02	EPOST	51	20	0	98	100	75
Fenoxaprop	0.15	EPOST	100	100	95	68	0	0
[Acifluorfen + bentazon (Storm)] + AG-98 (0.25%)	0.75	EPOST	65	49	15	100	100	75
Bispyribac-sodium + Kinetic (0.125%)	0.02	EPOST	90	100	100	99	99	100
Quinclorac + Agri-Dex (1%)	0.25	EPOST	98	100	100	95	98	100
Imazethapyr	0.063	EPOST	96	100	100	84	21	0
Imazethapyr + propanil (Stam M-4) + AG-98 (0.25%)	0.063 3.0	EPOST	100	100	100	100	98	100
Imazethapyr + halosulfuron + AG-98 (0.25%)	0.063 0.047	EPOST	99	100	100	85	98	98
Imazethapyr + (propanil + molinate)	0.063 4.5	EPOST	100	100	100	100	96	100
Imazethapyr + propanil (Super Wham) + Penetrator Plus (1 pt/A)	0.063 3.0	EPOST	100	100	100	100	99	100
Imazethapyr + triclopyr + AG-98 (0.25%)	0.063 0.25	EPOST	95	100	100	96	91	90

continued

Table 13. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Broadleaf signalgrass (BRAPP)			Carpetweed (MOLVE)	Hemp sesbania (SEBEX)	
			6/4	6/15	7/12	6/4	7/12	7/27
			----- (%) -----					
Imazethapyr + bensulfuron + AG-98 (0.25%)	0.063 0.125	EPOST	96	100	100	99	98	100
Imazethapyr + thiobencarb	0.063 3.0	EPOST	100	100	100	93	75	41
Imazethapyr + carfentrazone + AG-98 (0.25%)	0.063 0.02	EPOST	98	100	100	95	98	95
Imazethapyr + fenoxaprop	0.063 0.15	EPOST	100	100	100	78	0	0
Imazethapyr + [acifluorfen + bentazon (Storm)] + AG-98 (0.25%)	0.063 0.75	EPOST	100	100	100	100	95	91
Imazethapyr + bispyribac-sodium + Kinetic (0.125%)	0.063 0.02	EPOST	99	100	100	100	95	94
Imazethapyr + quinclorac + Agri-Dex (1%)	0.063 0.25	EPOST	99	100	100	89	99	100
LSD (0.05)			12	19	10	9	8	27

continued

Table 13. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control						Effect on rice		Yield 8/18 (lb/A)
			Barnyardgrass (ECHCG)		Amazon sprangletop (LEFPA)		Injury				
			7/12	7/27	7/12	7/27	6/15	7/12	7/27		
Untreated check			0	0	0	0	0	0	0	1710	
Propanil (Stam M-4) + AG-98 (0.25%)	3.0	EPOST	16	0	100	100	5	0	0	2790	
Halosulfuron + AG-98 (0.25%)	0.047	EPOST	59	16	20	10	3	0	0	2745	
(Propanil + molinate)	4.5	EPOST	64	0	100	100	5	0	0	3510	
Propanil (Super Wham) + Penetrator Plus (1 pt/A)	3.0	EPOST	60	0	96	98	20	3	0	3420	
Triclopyr + AG-98 (0.25%)	0.25	EPOST	0	0	25	50	10	0	3	1215	
Bensulfuron + AG-98 (0.25%)	0.125	EPOST	20	0	45	70	0	0	1	2520	
Thiobencarb	3.0	EPOST	15	15	40	18	0	0	1	2430	
Carfentrazone	0.02	EPOST	0	10	0	0	0	0	1	1935	
Fenoxaprop	0.15	EPOST	93	85	100	100	94	86	88	1440	
[Acifluorfen + bentazon (Storm)] + AG-98 (0.25%)	0.75	EPOST	13	0	98	96	18	0	0	2340	
Bispyribac-sodium + Kinetic (0.125%)	0.02	EPOST	73	96	75	13	15	1	0	4005	
Quinclorac + Agri-Dex (1%)	0.25	EPOST	93	99	34	0	4	0	0	3600	
Imazethapyr	0.063	EPOST	100	100	100	98	41	14	5	3285	
Imazethapyr + propanil (Stam M-4) + AG-98 (0.25%)	0.063 3.0	EPOST	100	100	100	100	45	18	5	4275	
Imazethapyr + halosulfuron + AG-98 (0.25%)	0.063 0.047	EPOST	100	99	100	100	33	9	6	3510	
Imazethapyr + (propanil + molinate)	0.063 4.5	EPOST	100	100	100	100	43	11	3	4320	
Imazethapyr + propanil (Super Wham) + Penetrator Plus (1 pt/A)	0.063 3.0	EPOST	100	100	100	100	43	13	8	4590	
Imazethapyr + triclopyr + AG-98 (0.25%)	0.063 0.25	EPOST	100	100	100	93	36	13	6	3780	

continued

Table 13. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control						Effect on rice		Yield 8/18 (lb/A)
			Barnyardgrass (ECHCG)		Amazon sprangletop (LEFPA)		Injury				
			7/12	7/27	7/12	7/27	6/15	7/12	7/27		
			----- (%) -----								
Imazethapyr + bensulfuron + AG-98 (0.25%)	0.063 0.125	EPOST	100	100	100	95	36	3	4	4320	
Imazethapyr + thiobencarb	0.063 3.0	EPOST	99	100	100	85	46	13	5	3645	
Imazethapyr + carfentrazone + AG-98 (0.25%)	0.063 0.02	EPOST	100	100	100	99	34	5	4	4410	
Imazethapyr + fenoxaprop	0.063 0.15	EPOST	100	100	100	100	51	19	6	2565	
Imazethapyr + [acifluorfen + bentazon (Storm) + AG-98 (0.25%)	0.063 0.75	EPOST	100	100	100	100	40	11	8	4095	
Imazethapyr + bispyribac-sodium + Kinetic (0.125%)	0.063 0.02	EPOST	100	100	100	93	33	10	5	3915	
Imazethapyr + quinclorac + Agri-Dex (1%)	0.063 0.25	EPOST	100	100	100	95	20	5	3	4230	
LSD (0.05)			19	15	28	24	13	8	6	855	

Table 14. Using other IMI herbicides on IMI-rice, Lonoke, 1999.

TEST INFORMATION

Location	Lonoke	Planting date	May 12, 1999
Experimental Design / replications	RCB / 4	Harvest date	August 20, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / 93AS3510
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.4 / 4.8		

Comments: PPI = preplant incorporated; 2-3 LF = 2- to 3-leaf rice; and PREFL = pre-flood; IMI-rice = rice tolerant to the imidazolinone herbicide imazethapyr (Pursuit).

Application type	PPI	2-3 LF	PREFL
Date applied	5/12/99	6/2/99	6/17/99
Time	12:30 pm	4:05 pm	10:00 pm
Incorporation equipment	field cultivator	N/A	N/A
Air/Soil temperature (F)	80 / 76	93 / 80	70 / 64
Relative humidity (%)	68	53	52
Wind (mph)	4	5	9
Weather	mostly clear	mostly cloudy	clear
Soil moisture	dry	damp	moist
Crop stage/Height	N/A	3 lf / 5"	early tillering / 4"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	16 / 6 / 20	19 / 6 / 20	21 / 6 / 20
Gpa / Psi	10 / 19	10 / 18	10 / 13
Weed species	----- [# leaves/height (in.)] -----		
BRAPP	N/A	3 lf / 3"	N/A
MOLVE	N/A	5 lf / 0"	N/A
CYPCP	N/A	3 lf / 1.5"	N/A
R-ECHCG	N/A	3 lf / 3"	N/A
CYPES	N/A	6 lf / 6"	N/A

Conclusions: This study was designed to compare efficacy of and injury caused by imidazolinone and sulfonylurea herbicides applied to IMI-tolerant rice. Due to a prolonged wet period prior to 2-3 LF applications, the rice was somewhat stressed and all postemergence treatments injured the rice significantly. Imazapic (Cadre), imazamox (Raptor), and nicosulfuron (Accent) gave the highest crop injury ratings, which was reflected in yields.

Table 14. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Broadleaf signalgrass (BRAPP)				Barnyardgrass (ECHCG)		
			6/4	6/15	7/12	7/29	Susceptible		Resistant 6/15
							6/4	7/29	
Untreated check			0	0	0	0	0	0	0
Imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	0	100	100	100	0	100	100
Imazaquin + AG-98 (0.25%)	0.063	2-3 LF	0	80	71	84	0	89	98
Imazapic + AG-98 (0.25%)	0.063	2-3 LF	0	100	100	100	0	100	100
Imazamox + AG-98 (0.25%)	0.039	2-3 LF	0	98	100	100	0	98	100
Imazethapyr	0.063	PPI	98	94	100	96	84	95	95
Imazethapyr <i>fb</i>	0.063	PPI							
imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	84	100	100	100	78	100	100
Imazethapyr <i>fb</i>	0.063	PPI							
imazaquin + AG-98 (0.25%)	0.063	2-3 LF	94	99	100	100	98	100	100
Imazethapyr <i>fb</i>	0.063	PPI							
imazapic + AG-98 (0.25%)	0.063	2-3 LF	96	100	100	100	79	100	100
Imazethapyr <i>fb</i>	0.063	PPI							
imazamox + AG-98 (0.25%)	0.039	2-3 LF	95	100	100	100	91	100	100
Imazaquin	0.063	PPI	84	70	70	68	75	70	73
Imazaquin <i>fb</i>	0.063	PPI							
imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	93	100	100	100	83	100	100
Imazaquin <i>fb</i>	0.063	PPI							
imazaquin + AG-98 (0.25%)	0.063	2-3 LF	100	100	99	100	81	100	100
Imazaquin <i>fb</i>	0.063	PPI							
imazapic + AG-98 (0.25%)	0.063	2-3 LF	100	100	100	100	88	100	100
Imazaquin <i>fb</i>	0.063	PPI							
imazamox + AG-98 (0.25%)	0.039	2-3 LF	95	100	100	100	73	100	100
Imazapic	0.063	PPI	100	100	100	100	96	100	98

continued

Table 14. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Broadleaf signalgrass (BRAPP)				Barnyardgrass (ECHCG)		
			6/4	6/15	7/12	7/29	Susceptible 6/4 7/29	Resistant 6/15	
			----- (%) -----						
Imazapic <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI 2-3 LF	100	100	100	100	98	100	100
Imazapic <i>fb</i> imazaquin + AG-98 (0.25%)	0.063 0.063	PPI 2-3 LF	100	100	100	100	95	100	100
Imazapic <i>fb</i> imazapic + AG-98 (0.25%)	0.063 0.063	PPI 2-3 LF	95	100	100	100	96	100	100
Imazapic <i>fb</i> imazamox + AG-98 (0.25%)	0.063 0.039	PPI 2-3 LF	99	100	100	100	94	100	100
Nicosulfuron + AG-98 (0.25%) <i>fb</i> nicosulfuron + AG-98 (0.25%)	0.031 0.031	2-3 LF PREFL	0	100	100	100	0	100	100
LSD (0.05)			9	6	18	7	11	5	6

continued

Table 14. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Annual sedge (CYPCP)		Carpetweed (MOLVE)		Eclipta (ECLAL)	
			6/4	6/15	6/4	6/15	7/12	7/29
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	0	100	0	68	50	0
Imazaquin + AG-98 (0.25%)	0.063	2-3 LF	0	100	0	74	100	100
Imazapic + AG-98 (0.25%)	0.063	2-3 LF	0	100	0	98	100	100
Imazamox + AG-98 (0.25%)	0.039	2-3 LF	0	100	0	80	23	25
Imazethapyr	0.063	PPI	100	95	91	83	45	0

continued

Table 14. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Annual sedge (CYPCP)		Carpetweed (MOLVE)		Eclipta (ECLAL)	
			6/4	6/15	6/4	6/15	7/12	7/29
						----- (%) -----		
Imazethapyr <i>fb</i>	0.063	PPI						
imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	100	100	88	95	25	0
Imazethapyr <i>fb</i>	0.063	PPI						
imazaquin + AG-98 (0.25%)	0.063	2-3 LF	100	100	100	95	100	100
Imazethapyr <i>fb</i>	0.063	PPI						
imazapic + AG-98 (0.25%)	0.063	2-3 LF	100	100	95	100	100	100
Imazethapyr <i>fb</i>	0.063	PPI						
imazamox + AG-98 (0.25%)	0.039	2-3 LF	100	100	98	93	75	50
Imazaquin	0.063	PPI	97	90	100	92	95	50
Imazaquin <i>fb</i>	0.063	PPI						
imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	100	100	100	100	45	50
Imazaquin <i>fb</i>	0.063	PPI						
imazaquin + AG-98 (0.25%)	0.063	2-3 LF	100	100	100	93	97	100
Imazaquin <i>fb</i>	0.063	PPI						
imazapic + AG-98 (0.25%)	0.063	2-3 LF	100	100	100	100	100	100
Imazaquin <i>fb</i>	0.063	PPI						
imazamox + AG-98 (0.25%)	0.039	2-3 LF	98	100	100	96	93	98
Imazapic	0.063	PPI	100	98	100	89	25	0
Imazapic <i>fb</i>	0.063	PPI						
imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	100	100	100	99	95	75
Imazapic <i>fb</i>	0.063	PPI						
imazaquin + AG-98 (0.25%)	0.063	2-3 LF	100	100	100	98	100	100
Imazapic <i>fb</i>	0.063	PPI						
imazapic + AG-98 (0.25%)	0.063	2-3 LF	100	100	100	100	100	100

continued

Table 14. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Annual sedge (CYPCP)		Carpetweed (MOLVE)		Eclipta (ECLAL)	
			6/4	6/15	6/4	6/15	7/12	7/29
			----- (%) -----					
Imazapic <i>fb</i> imazamox + AG-98 (0.25%)	0.063 0.039	PPI 2-3 LF	100	100	100	100	75	75
Nicosulfuron + AG-98 (0.25%) <i>fb</i> nicosulfuron + AG-98 (0.25%)	0.031 0.031	2-3 LF PREFL	0	100	0	100	100	100
LSD (0.05)			2	5	7	11	40	37

continued

Table 14. Section 3.

Herbicide	Rate (lb/A)	Application timing	Weed control							Yield 8/20 (lb/A)
			Amazon sprangletop (LEFPA)		Hemp sesbania (SEBEX)	Effect on rice				
			7/12	7/29	7/29	Injury				
			----- (%) -----							
Untreated check			20	0	0	0	0	0	0	2115
Imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	100	91	0	0	58	11	10	3780
Imazaquin + AG-98 (0.25%)	0.063	2-3 LF	50	46	50	0	30	5	3	3510
Imazapic + AG-98 (0.25%)	0.063	2-3 LF	100	98	25	5	78	49	39	3465
Imazamox + AG-98 (0.25%)	0.039	2-3 LF	100	95	25	0	68	34	25	3420
Imazethapyr	0.063	PPI	69	66	25	5	11	0	0	3825
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI 2-3 LF	100	100	0	11	49	6	9	4185
Imazethapyr <i>fb</i> imazaquin + AG-98 (0.25%)	0.063 0.063	PPI 2-3 LF	98	91	65	13	46	15	9	4230
Imazethapyr <i>fb</i> imazapic + AG-98 (0.25%)	0.063 0.063	PPI 2-3 LF	100	100	0	9	80	44	36	3150

continued

Table 14. Section 3. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control		Hemp sesbania (SEBEX) 7/29 (%)	Effect on rice				Yield 8/20 (lb/A)
			Amazon sprangletop (LEFPA)			Injury				
			7/12	7/29		6/4	6/15	7/12	7/29	
Imazethapyr <i>fb</i>	0.063	PPI								
imazamox + AG-98 (0.25%)	0.039	2-3 LF	100	100	0	11	80	38	35	3555
Imazaquin	0.063	PPI	65	93	23	11	15	10	0	3870
Imazaquin <i>fb</i>	0.063	PPI								
imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	100	100	23	8	48	3	5	4275
Imazaquin <i>fb</i>	0.063	PPI								
imazaquin + AG-98 (0.25%)	0.063	2-3 LF	89	68	95	16	54	23	9	4455
Imazaquin <i>fb</i>	0.063	PPI								
imazapic + AG-98 (0.25%)	0.063	2-3 LF	100	100	0	18	81	60	54	3150
Imazaquin <i>fb</i>	0.063	PPI								
imazamox + AG-98 (0.25%)	0.039	2-3 LF	100	100	20	9	71	34	20	4095
Imazapic	0.063	PPI	93	94	0	19	21	3	0	3870
Imazapic <i>fb</i>	0.063	PPI								
imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	100	100	0	19	71	33	26	3690
Imazapic <i>fb</i>	0.063	PPI								
imazaquin + AG-98 (0.25%)	0.063	2-3 LF	98	100	43	19	55	10	9	4410
Imazapic <i>fb</i>	0.063	PPI								
imazapic + AG-98 (0.25%)	0.063	2-3 LF	100	100	0	19	85	69	68	2835
Imazapic <i>fb</i>	0.063	PPI								
imazamox + AG-98 (0.25%)	0.039	2-3 LF	100	100	0	16	80	53	41	3240
Nicosulfuron + AG-98 (0.25%) <i>fb</i>	0.031	2-3 LF								
nicosulfuron + AG-98 (0.25%)	0.031	PREFL	100	100	93	0	71	61	60	3375
LSD (0.05)			28	27	36	12	16	16	20	720

Table 15. Imazethapyr + pendimethalin (Prowl) for weed control in IMI-rice, Lonoke, 1999.

TEST INFORMATION

Location	Lonoke	Planting date	May 12, 1999
Experimental Design / replications	RCB / 4	Harvest date	August 20, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / 93AS3510
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.4 / 4.8		

Comments: PRE = preplant; DPRE = delayed preemergence; and SPIKE = spiking. IMI-rice = rice tolerant to the imidazolinone herbicide imazethapyr (Pursuit).

Application type	PRE	DPRE	SPIKE
Date applied	5/12/99	5/17/99	5/24/99
Time	4:45 pm	6:20 pm	10:30 pm
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	78 / 79	82 / 73	72 / 70
Relative humidity (%)	55	60	53
Wind (mph)	4	5	5
Weather	partly cloudy	cloudy	clear
Soil moisture	dry	damp	moist
Crop stage/Height	N/A	N/A	1 lf / 1.5"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	16 / 6 / 20	16 / 6 / 20	16 / 6 / 20
Gpa / Psi	10 / 19	10 / 23	10 / 19
Weed species	-----	[# leaves/height (in.)]	-----
CYPCP	N/A	N/A	1 lf / 0.125"
BRAPP	N/A	N/A	1 lf / 0.5"
MOLVE	N/A	N/A	cotyledon / 0.125"

Conclusions: This study (a repeat of a 1998 test) was conducted to evaluate the tolerance of IMI-rice to imazethapyr and pendimethalin (Prowl) at various application timings. Pendimethalin alone did not effectively control broadleaf signalgrass, annual sedge, or carpetweed. All the treatments containing imazethapyr provided excellent control of these weeds. Imazethapyr applied at the spiking stage of rice injured the rice. However, these applications were made late and most of the rice had one leaf partially exposed to the spray. These timings are examined more closely in another study (Table 24).

Table 15. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Broadleaf signalgrass (BRAPP)				Annual sedge (CYPCP)		Carpetweed (MOLVE)	
			6/4	6/15	7/12	7/29	6/4	6/15	6/4	6/15
			----- (%) -----							
Untreated check			0	0	10	0	0	0	0	0
Pendimethalin	1.0	PRE	82	0	1	18	93	0	95	0
Pendimethalin	1.0	DPRE	86	0	15	38	95	0	98	0
Pendimethalin	1.0	SPIKE	91	0	30	45	98	0	100	0
Imazethapyr	0.063	PRE	100	90	98	90	100	98	100	96
Imazethapyr	0.125	PRE	100	75	94	94	100	98	100	100
Imazethapyr	0.063	DPRE	100	94	99	99	100	100	100	100
Imazethapyr	0.125	DPRE	100	100	100	100	100	100	100	99
Imazethapyr + AG-98 (0.25%)	0.063	SPIKE	100	95	100	96	100	100	100	98
Imazethapyr + AG-98 (0.25%)	0.125	SPIKE	100	100	100	100	100	100	100	99
Imazethapyr + pendimethalin	0.063 1.0	PRE	100	88	100	88	100	98	100	98
Imazethapyr + pendimethalin	0.125 1.0	PRE	100	99	100	100	100	100	100	100
Imazethapyr + pendimethalin	0.063 1.0	DPRE	100	99	100	100	100	100	100	100
Imazethapyr + pendimethalin	0.125 1.0	DPRE	100	100	100	100	100	100	100	100
Imazethapyr + pendimethalin + AG-98 (0.25%)	0.063 1.0	SPIKE	100	99	100	100	100	100	100	100
Imazethapyr + pendimethalin + AG-98 (0.25%)	0.125 1.0	SPIKE	100	100	100	100	100	100	100	100
LSD (0.05)			5	16	15	17	4	3	2	3

continued

Table 15. Section 2.

Herbicide	Application		Weed control							Yield 8/20 (lb/A)
			Eclipta (ECLAL)		Hemp sesbania (SEBEX)	Effect on rice				
			7/12	7/29	7/29	Injury				
			6/4	6/15	7/12	7/29	8/20			
Rate (lb/A)	timing	----- (%) -----							Yield (lb/A)	
Untreated check			20	0	0	0	0	0	0	2655
Pendimethalin	1.0	PRE	0	0	1	1	0	0	0	2025
Pendimethalin	1.0	DPRE	0	0	25	6	0	0	0	2475
Pendimethalin	1.0	SPIKE	75	25	25	0	0	0	0	3150
Imazethapyr	0.063	PRE	0	0	0	3	0	0	0	3420
Imazethapyr	0.125	PRE	68	0	50	5	0	0	0	3420
Imazethapyr	0.063	DPRE	0	0	0	3	0	0	0	4320
Imazethapyr	0.125	DPRE	75	0	0	9	5	0	0	3960
Imazethapyr + AG-98 (0.25%)	0.063	SPIKE	40	0	25	8	4	0	0	3780
Imazethapyr + AG-98 (0.25%)	0.125	SPIKE	33	0	0	20	21	0	0	3780
Imazethapyr + pendimethalin	0.063 1.0	PRE	0	0	0	3	1	0	0	3240
Imazethapyr + pendimethalin	0.125 1.0	PRE	50	25	0	3	3	0	0	3735
Imazethapyr + pendimethalin	0.063 1.0	DPRE	45	0	25	8	1	0	3	3690
Imazethapyr + pendimethalin	0.125 1.0	DPRE	45	0	25	10	5	0	0	3780
Imazethapyr + pendimethalin + AG-98 (0.25%)	0.063 1.0	SPIKE	100	75	25	11	3	0	0	3915
Imazethapyr + pendimethalin + AG-98 (0.25%)	0.125 1.0	SPIKE	100	75	50	23	14	0	0	4365
LSD (0.05)			54	36	NS	6	4	NS	1	810

Table 16. Imazethapyr flush vs no flush of soil-applied treatments, Lonoke, 1999.**TEST INFORMATION**

Location	Lonoke	Planting date	May 12, 1999
Experimental Design / replications	RCB / 4	Harvest date	August 17, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / 93AS3510
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.4 / 4.8		

Comments: PPI = preplant incorporated; PRE = preemergence; and EPOST = early postemergence.

Application type	PPI	PRE	EPOST
Date applied	5/12/99	5/12/99	6/2/99
Time	10:50 am	4:00 pm	3:30 pm
Incorporation equipment	field cultivator	N/A	N/A
Air/Soil temperature (F)	70 / 68	94 / 79	96 / 70
Relative humidity (%)	82	34	56
Wind (mph)	6	6	4
Weather	partly cloudy	partly cloudy	mostly cloudy
Soil moisture	dry	dry	saturated
Crop stage/Height	N/A	N/A	1 tiller / 6"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	16 / 6 / 20	16 / 6 / 20	19 / 6 / 20
Gpa / Psi	10 / 19	10 / 19	10 / 18
Weed species	----- [# leaves/height (in.)] -----		
BRAPP (flushed)	N/A	N/A	1 lf / 0.5"
BRAPP (no flush)	N/A	N/A	3 lf / 2"

Conclusions: This is a repetition of a study conducted in 1998 to evaluate the efficacy of soil-applied imazethapyr with and without a flush of irrigation water. Last year, rain showers occurred at time of flushing; therefore no differences were noted between the flush and no-flush factors. This year, broadleaf signalgrass control was significantly less from both PPI and PRE applications in the plots that did not receive a flush of irrigation water. Lack of control in these treatments caused a decrease in yield. Some rice injury occurred with the EPOST treatments. The flushed plots were injured to a greater extent because shortly after an irrigation, showers occurred for two days. This extended wet period caused the rice in the flush plots to emerge slowly. The plants were stressed due to prolonged wet soil conditions and, therefore, were not fully recovered by the time the EPOST treatments were applied.

Table 16. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control				
			Broadleaf signalgrass (BRAPP)			Carpetweed (MOLVE)	
			6/4	6/15	7/27	6/4	6/15
			----- (%) -----				
FLUSHED:							
Untreated check			0	0	0	0	0
Imazethapyr	0.063	PPI	97	88	93	93	0
Imazethapyr	0.063	PRE	98	92	100	95	0
Imazethapyr <i>fb</i>	0.063	PPI					
imazethapyr +	0.063						
AG-98 (0.25%)		EPOST	100	100	100	100	0
Imazethapyr <i>fb</i>	0.063	PRE					
imazethapyr +	0.063						
AG-98 (0.25%)		EPOST	100	100	100	100	0
NOT FLUSHED:							
Untreated check			0	0	0	0	0
Imazethapyr	0.063	PPI	60	68	38	100	0
Imazethapyr	0.063	PRE	40	30	23	100	0
Imazethapyr <i>fb</i>	0.063	PPI					
imazethapyr +	0.063						
AG-98 (0.25%)		EPOST	80	100	100	100	0
Imazethapyr <i>fb</i>	0.063	PRE					
imazethapyr +	0.063						
AG-98 (0.25%)		EPOST	58	100	100	100	0
LSD (0.05)			20	17	29	4	NS

continued

Table 16. Section 2.

Herbicide	Rate (lb/A)	Application timing	Eclipta (ECLAL)		Effect on rice		
			control	6/4	Injury		Yield
			7/27		6/15	7/27	8/17
			----- (%) -----				(lb/A)
FLUSHED:							
Untreated check			0	0	0	0	1485
Imazethapyr	0.063	PPI	33	0	0	3	2970
Imazethapyr	0.063	PRE	33	0	0	2	2655
Imazethapyr <i>fb</i>	0.063	PPI					
imazethapyr +	0.063						
AG-98 (0.25%)		EPOST	100	0	25	8	3150
Imazethapyr <i>fb</i>	0.063	PRE					
imazethapyr +	0.063						
AG-98 (0.25%)		EPOST	100	0	28	10	2430
NOT FLUSHED:							
Untreated check			0	0	0	0	1485
Imazethapyr	0.063	PPI	67	0	0	0	2205
Imazethapyr	0.063	PRE	67	0	0	0	1665
Imazethapyr <i>fb</i>	0.063	PPI					
imazethapyr +	0.063						
AG-98 (0.25%)		EPOST	100	0	20	7	3150
Imazethapyr <i>fb</i>	0.063	PRE					
imazethapyr +	0.063						
AG-98 (0.25%)		EPOST	100	0	20	5	3330
LSD (0.05)			54	NS	3	5	1350

Table 17. Grass weed control with sequential pre flood applications of imazethapyr in IMI-tolerant rice, Lodge Corner, 1999.

TEST INFORMATION

Location	Lodge Corner	Planting date	May 3, 1999
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	7 ft by 20 ft	Crop / Variety	Rice / 93AS3510
Row width / Number of rows per plot	7.5 in. / 9 rows	Dates of flushing	May 15, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 8, 1999
% OM / pH	1.4 / 4.8		

Comments: PPI = preplant incorporated; PRE = preemergence; 2-3 LF = 2-3 leaf rice; and PREFL = pre flood; IMI-tolerant rice = rice tolerant to the imidazolinone herbicide imazethapyr (Pursuit). Barnyardgrass and Amazon sprangletop were rated together on 6/11 and 6/22 under the heading of annual grasses.

Application type	PPI	PRE	2-3 LF	PREFL
Date applied	5/3/99	5/3/99	5/24/99	6/3/99
Time	12:05 pm	5:00 pm	2:35 pm	3:40 pm
Incorporation equipment	field cultivator	N/A	N/A	N/A
Air/Soil temperature (F)	77 / 69	84 / 70	82 / 78	92 / 84
Relative humidity (%)	51	33	32	65
Wind (mph)	6	7	2	5
Weather	clear	partly cloudy	clear	mostly clear
Soil moisture	moist	moist	damp	saturated
Crop stage/Height	N/A	N/A	3-4 lf / 5"	1 tiller / 9"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	15 / 4 / 20	15 / 4 / 20	18 / 4 / 20	20 / 4 / 20
Gpa / Psi	10 / 22	10 / 21	10 / 19	10 / 15
Weed species	----- [# leaves/height (in.)] -----			
CYPES	N/A	N/A	2-4 lf / 4"	vegetative / 6-12"
SEBEX	N/A	N/A	1-2 lf / 1.5"	N/A
AESVI	N/A	N/A	N/A	3-5 lf / 2-4"
LEFPA	N/A	N/A	N/A	2-3 lf / 4"

Conclusions: In 1998, imazethapyr was evaluated in IMI-tolerant rice for yellow nutsedge control. Sequential applications of imazethapyr provided excellent control of yellow nutsedge and a variety of other rice weeds. The treatment list was expanded in 1999 to include several tank mix sequentials at different application timings. These mixtures provided excellent control of yellow nutsedge and other rice weeds. These tank mixes include imazethapyr plus halosulfuron (Permit), bispyribac-sodium (Regiment), or propanil (Super Wham). Although the imazethapyr sequential (PPI followed by 2-3 LF) provided excellent control of yellow nutsedge the tank mixtures provided control of hemp sesbania, northern jointvetch, and other legumes not controlled by imazethapyr alone. There were no tank mixing problems or antagonism with any of the mixtures and spectrum of weed control was broadened. There was some crop injury from the 2-3 LF imazethapyr treatments, but it was short-lived. The study was not harvested due to bird damage and shattering of the rice.

Table 17. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Annual grasses		Barnyard- grass (ECHCG)	Amazon sprangletop (LEFPA)	Hemp sesbania / Northern jointvetch mix (SEBEX/AESVI)			
			6/11	6/22	8/3	8/3	6/3	6/11	6/22	
Untreated check			0	0	0	0	0	0	0	0
Imazethapyr	0.063	PPI	100	91	95	100	23	10	15	
Imazethapyr	0.125	PPI	100	96	100	100	31	5	0	
Imazethapyr	0.063	PRE	90	86	94	100	33	25	25	
Imazethapyr	0.125	PRE	80	83	94	100	0	0	0	
Imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	98	94	100	99	30	40	20	
Imazethapyr + AG-98 (0.25%)	0.125	2-3 LF	100	94	100	100	26	70	5	
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	78	93	90	98	0	75	11	
Imazethapyr + AG-98 (0.25%)	0.125	PREFL	93	100	100	100	0	38	13	
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	2-3 LF	96	100	100	100	50	28	0	
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	2-3 LF	100	96	100	100	28	38	11	
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PREFL	96	98	100	100	28	68	5	
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PREFL	88	94	100	100	23	58	3	
Imazethapyr + AG-98 (0.25%) <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	2-3 LF PREFL	100	99	100	100	45	80	14	
Imazethapyr + AG-98 (0.25%) <i>fb</i> propanil + Penetrator Plus (1 pt/A)	0.063 4.0	2-3 LF PREFL	99	94	100	100	28	100	98	
Imazethapyr <i>fb</i> propanil + Penetrator Plus (1 pt/A)	0.063 4.0	PPI PREFL	98	94	100	100	36	100	100	

continued

Table 17. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Annual grasses		Barnyard- grass (ECHCG)	Amazon sprangletop (LEFPA)	Hemp sesbania / Northern jointvetch mix (SEBEX/AESVI)		
			6/11	6/22	8/3	8/3	6/3	6/11	6/22
			----- (%) -----						
Imazethapyr <i>fb</i>	0.063	PPI							
propanil +	4.0								
imazethapyr +	0.063								
Penetrator Plus (1 pt/A)		PREFL	95	100	100	100	30	100	100
Imazethapyr +	0.063								
AG-98 (0.25%) <i>fb</i>		2-3 LF							
propanil +	4.0								
imazethapyr +	0.063								
Penetrator Plus (1 pt/A)		PREFL	100	100	100	100	40	100	100
Imazethapyr <i>fb</i>	0.063	PPI							
[bensulfuron + propanil Duet] +	4.031								
Penetrator Plus (1 pt/A)		PREFL	100	94	100	100	33	63	5
Imazethapyr <i>fb</i>	0.063	PPI							
bispyribac-sodium +	0.02								
Kinetic (0.125%)		PREFL	100	99	100	100	28	93	100
Imazethapyr <i>fb</i>	0.063	PPI							
imazethapyr +	0.063								
bispyribac-sodium +	0.02								
Kinetic (0.125%)		PREFL	95	100	100	100	21	96	98
Imazethapyr <i>fb</i>	0.063	PPI							
imazethapyr +	0.063								
halosulfuron +	0.047								
AG-98 (0.25%)		PREFL	100	100	100	100	18	95	100
Clomazone <i>fb</i>	0.3	PPI							
propanil +	4.0								
halosulfuron +	0.047								
Penetrator Plus (1 pt/A)		PREFL	81	96	100	100	23	100	100
Imazethapyr <i>fb</i>	0.063	PPI							
halosulfuron +	0.047								
Induce (0.25%)		PREFL	100	100	99	100	15	96	95
Imazethapyr <i>fb</i>	0.063	PPI							
carfentrazone +	0.02								
AG-98 (0.25%)		2-3 LF	96	98	96	100	81	73	13

continued

Table 17. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Annual grasses		Barnyard- grass (ECHCG)	Amazon sprangletop (LEFPA)	Hemp sesbania / Northern jointvetch mix (SEBEX/AESVI)		
			6/11	6/22	8/3	8/3	6/3	6/11	6/22
			----- (%) -----						
Clomazone <i>fb</i>	0.3	PRE							
propanil +	4.0								
halosulfuron +	0.047								
Penetrator Plus (1 pt/A)		PREFL	85	96	100	100	15	100	100
LSD (0.05)			9	7	5	1	29	29	18

continued

Table 17. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Yellow nutsedge (CYPES)					Hemp sesbania (SEBEX)
			5/24	6/3	6/11	6/22	6/25	8/3
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Imazethapyr	0.063	PPI	63	55	51	44	65	0
Imazethapyr	0.125	PPI	75	75	70	85	79	0
Imazethapyr	0.063	PRE	56	49	43	30	34	50
Imazethapyr	0.125	PRE	49	16	10	0	15	0
Imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	0	48	63	38	45	25
Imazethapyr + AG-98 (0.25%)	0.125	2-3 LF	0	56	76	76	81	21
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	0	0	10	65	71	48
Imazethapyr + AG-98 (0.25%)	0.125	PREFL	0	0	58	91	89	23
Imazethapyr <i>fb</i>	0.063	PPI						
imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	80	88	91	96	93	0
Imazethapyr <i>fb</i>	0.063	PRE						
imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	46	71	74	71	80	23

continued

Table 17. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control					Hemp sesbania (SEBEX)
			Yellow nutsedge (CYPES)					8/3
			5/24	6/3	6/11	6/22	6/25	(%)
Imazethapyr <i>fb</i>	0.063	PPI						
imazethapyr + AG-98 (0.25%)	0.063	PREFL	73	76	84	96	90	0
Imazethapyr <i>fb</i>	0.063	PRE						
imazethapyr + AG-98 (0.25%)	0.063	PREFL	26	25	64	74	75	58
Imazethapyr + AG-98 (0.25%) <i>fb</i>	0.063	2-3 LF						
imazethapyr + AG-98 (0.25%)	0.063	PREFL	0	55	85	93	90	40
Imazethapyr + AG-98 (0.25%) <i>fb</i>	0.063	2-3 LF						
propanil + Penetrator Plus (1 pt/A)	4.0	PREFL	0	49	65	56	70	100
Imazethapyr <i>fb</i>	0.063	PPI						
propanil + Penetrator Plus (1 pt/A)	4.0	PREFL	55	69	68	40	63	100
Imazethapyr <i>fb</i>	0.063	PPI						
propanil + imazethapyr + Penetrator Plus (1 pt/A)	4.0 0.063	PREFL	51	61	76	85	79	100
Imazethapyr + AG-98 (0.25%) <i>fb</i>	0.063	2-3 LF						
propanil + imazethapyr + Penetrator Plus (1 pt/A)	4.0 0.063	PREFL	0	45	85	91	90	100
Imazethapyr <i>fb</i>	0.063	PPI						
[bensulfuron + propanil (Duet)] + Penetrator Plus (1 pt/A)	4.031	PREFL	35	69	69	56	71	65
Imazethapyr <i>fb</i>	0.063	PPI						
bispyribac-sodium + Kinetic (0.125%)	0.02	PREFL	51	66	78	76	75	93
Imazethapyr <i>fb</i>	0.063	PPI						
imazethapyr + bispyribac-sodium + Kinetic (0.125%)	0.063 0.02	PREFL	58	61	83	86	86	100

continued

Table 17. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control					Hemp sesbania (SEBEX)
			Yellow nutsedge (CYPES)					8/3
			5/24	6/3	6/11	6/22	6/25	(%)
Imazethapyr <i>fb</i>	0.063	PPI						
imazethapyr +	0.063							
halosulfuron +	0.047							
AG-98 (0.25%)		PREFL	38	74	80	98	94	100
Clomazone <i>fb</i>	0.3	PPI						
propanil +	4.0							
halosulfuron +	0.047							
Penetrator Plus (1 pt/A)		PREFL	15	5	66	91	68	100
Imazethapyr <i>fb</i>	0.063	PPI						
halosulfuron +	0.047							
Induce (0.25%)		PREFL	35	64	81	95	90	100
Imazethapyr <i>fb</i>	0.063	PPI						
carfentrazone +	0.02							
AG-98 (0.25%)		2-3 LF	65	78	78	81	79	70
Clomazone <i>fb</i>	0.3	PRE						
propanil +	4.0							
halosulfuron +	0.047							
Penetrator Plus (1 pt/A)		PREFL	0	0	69	89	68	100
LSD (0.05)			33	22	20	26	21	42

continued

Table 17. Section 3.

Herbicide	Rate (lb/A)	Application timing	Weed control				
			Northern jointvetch (AESVI)		Red rice (ORYSA)		
			8/3	6/3	6/11	6/22	8/3
Untreated check			0	0	0	0	0
Imazethapyr	0.063	PPI	0	98	100	99	81
Imazethapyr	0.125	PPI	0	99	100	99	89
Imazethapyr	0.063	PRE	35	38	88	90	69
Imazethapyr	0.125	PRE	0	0	94	96	65
Imazethapyr +	0.063						
AG-98 (0.25%)		2-3 LF	23	45	98	99	91
Imazethapyr +	0.125						
AG-98 (0.25%)		2-3 LF	23	56	100	98	96

continued

Table 17. Section 3. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control				
			Northern jointvetch		Red rice (ORYSA)		
			(AESVI)				
			8/3	6/3	6/11	6/22	8/3
			----- (%) -----				
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	15	0	85	99	80
Imazethapyr + AG-98 (0.25%)	0.125	PREFL	24	0	94	100	95
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI 2-3 LF	0	100	100	100	93
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PRE 2-3 LF	23	89	100	100	89
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI PREFL	0	85	100	100	96
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PRE PREFL	38	43	89	100	89
Imazethapyr + AG-98 (0.25%) <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	2-3 LF PREFL	35	40	100	75	96
Imazethapyr + AG-98 (0.25%) <i>fb</i> propanil + Penetrator Plus (1 pt/A)	0.063 4.0	2-3 LF PREFL	100	39	100	100	89
Imazethapyr <i>fb</i> propanil + Penetrator Plus (1 pt/A)	0.063 4.0	PPI PREFL	100	89	99	100	74
Imazethapyr <i>fb</i> propanil + imazethapyr + Penetrator Plus (1 pt/A)	0.063 4.0 0.063	PPI PREFL	100	100	95	100	91
Imazethapyr + AG-98 (0.25%) <i>fb</i> propanil + imazethapyr + Penetrator Plus (1 pt/A)	0.063 4.0 0.063	2-3 LF PREFL	98	64	99	100	95

continued

Table 17. Section 3. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control				
			Northern jointvetch (AESVI)		Red rice (ORYSA)		
			8/3	6/3	6/11	6/22	8/3
			----- (%) -----				
Imazethapyr <i>fb</i>	0.063	PPI					
[bensulfuron + propanil (Duet) + Penetrator Plus (1 pt/A)]	4.031	PREFL	65	10	100	98	85
Imazethapyr <i>fb</i>	0.063	PPI					
bispyribac-sodium + Kinetic (0.125%)	0.02	PREFL	93	91	100	100	74
Imazethapyr <i>fb</i>	0.063	PPI					
imazethapyr + bispyribac-sodium + Kinetic (0.125%)	0.063 0.02	PREFL	98	70	98	100	93
Imazethapyr <i>fb</i>	0.063	PPI					
imazethapyr + halosulfuron + AG-98 (0.25%)	0.063 0.047	PREFL	96	73	100	100	95
Clomazone <i>fb</i>	0.3	PPI					
propanil + halosulfuron + Penetrator Plus (1 pt/A)	4.0 0.047	PREFL	100	25	0	0	0
Imazethapyr <i>fb</i>	0.063	PPI					
halosulfuron + Induce (0.25%)	0.047	PREFL	100	91	100	100	81
Imazethapyr <i>fb</i>	0.063	PPI					
carfentrazone + AG-98 (0.25%)	0.02	2-3 LF	66	85	98	93	78
Clomazone <i>fb</i>	0.3	PRE					
propanil + halosulfuron + Penetrator Plus (1 pt/A)	4.0 0.047	PREFL	100	23	0	18	18
LSD (0.05)			38	36	6	18	12

continued

Table 17. Section 4.

Herbicide	Rate (lb/A)	Application timing	Rice injury				
			5/24	6/3	6/11	6/22	6/25
			----- (%) -----				
Untreated check			0	0	0	0	0
Imazethapyr	0.063	PPI	0	1	1	5	0
Imazethapyr	0.125	PPI	0	1	4	0	0
Imazethapyr	0.063	PRE	0	0	0	0	0
Imazethapyr	0.125	PRE	0	0	0	0	0
Imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	0	15	1	0	0
Imazethapyr + AG-98 (0.25%)	0.125	2-3 LF	0	20	20	4	0
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	0	0	3	3	0
Imazethapyr + AG-98 (0.25%)	0.125	PREFL	0	0	6	0	0
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI 2-3 LF	0	10	14	6	0
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PRE 2-3 LF	0	15	10	5	0
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI PREFL	0	0	5	0	0
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PRE PREFL	0	0	5	8	0
Imazethapyr + AG-98 (0.25%) <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	2-3 LF PREFL	0	8	10	3	0
Imazethapyr + AG-98 (0.25%) <i>fb</i> propanil + Penetrator Plus (1 pt/A)	0.063 4.0	2-3 LF PREFL	0	14	11	3	0
Imazethapyr <i>fb</i> propanil + Penetrator Plus (1 pt/A)	0.063 4.0	PPI PREFL	0	1	8	3	0
Imazethapyr <i>fb</i> propanil + imazethapyr + Penetrator Plus (1 pt/A)	0.063 4.0 0.063	PPI PREFL	0	1	13	5	0

continued

Table 17. Section 4. Continued.

Herbicide	Rate (lb/A)	Application timing	Rice injury				
			5/24	6/3	6/11	6/22	6/25
			----- (%) -----				
Imazethapyr + AG-98 (0.25%) <i>fb</i>	0.063	2-3 LF					
propanil + imazethapyr + Penetrator Plus (1 pt/A)	4.0 0.063	PREFL	0	15	23	8	0
Imazethapyr <i>fb</i> [bensulfuron + propanil (Duet) + Penetrator Plus (1 pt/A)	0.063 4.031	PPI PREFL	0	4	0	3	0
Imazethapyr <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	0.063 0.02	PPI PREFL	0	1	3	6	0
Imazethapyr <i>fb</i> imazethapyr + bispyribac-sodium + Kinetic (0.125%)	0.063 0.063 0.02	PPI PREFL	0	0	4	9	0
Imazethapyr <i>fb</i> imazethapyr + halosulfuron + AG-98 (0.25%)	0.063 0.063 0.047	PPI PREFL	0	1	4	4	0
Clomazone <i>fb</i> propanil + halosulfuron + Penetrator Plus (1 pt/A)	0.3 4.0 0.047	PPI PREFL	0	0	5	4	0
Imazethapyr <i>fb</i> halosulfuron + Induce (0.25%)	0.063 0.047	PPI PREFL	0	5	9	6	0
Imazethapyr <i>fb</i> carfentrazone + AG-98 (0.25%)	0.063 0.02	PPI 2-3 LF	0	5	3	6	0
Clomazone <i>fb</i> propanil + halosulfuron + Penetrator Plus (1 pt/A)	0.3 4.0 0.047	PRE PREFL	0	0	13	8	0
LSD (0.05)			NS	4	6	8	NS

Table 18. Broadleaf signalgrass control in IMI-tolerant rice, Lonoke, 1999.

TEST INFORMATION

Location	Lonoke	Planting date	May 12, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 18, 1999
Plot size	10t by 20 ft	Crop / Variety	Rice / 93AS3510
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.6 / 4.2		

Comments: PPI = preplant incorporated; PRE = preemergence; DPRE = delayed preemergence; EPOST = early postemergence; PREFL = pre flood; and POFL = post flood. IMI-tolerant = rice tolerant to the imidazolinone herbicide imazethapyr (Pursuit).

Application type	PPI	PRE	DPRE	EPOST	PREFL	POFL
Date applied	5/12/99	5/12/99	5/18/99	6/2/99	6/16/99	6/21/99
Time	11:30 am	4:30 pm	3:00 pm	5:00 pm	4:25 pm	4:40 pm
Incorporation equip.	field cultivator	N/A	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	78 / 70	81 / 76	95 / 76	93 / 80	92 / 80	93 / 80
Relative humidity (%)	76	49	21	53	26	32
Wind (mph)	6	5	6	3	7	6
Weather	partly cloudy	partly cloudy	clear	partly cloudy	clear	clear
Soil moisture	dry	dry	saturated	damp	moist	flooded
Crop stage/Height	N/A	N/A	N/A	3 lf / 5"	2 tiller / 14"	3 tiller / 16"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	16 / 6 / 20	16 / 6 / 20	16 / 6 / 20	19 / 6 / 20	26 / 6 / 20	25 / 6 / 20
Gpa / Psi	10 / 19	10 / 19	10 / 19	10 / 19	10 / 23	10 / 21
Weed species	----- [# leaves/height (in.)] -----					
BRAPP	N/A	N/A	N/A	2-3 lf / 1.5"	4 tiller / 5"	4 tiller / 11-12"
MOLVE	N/A	N/A	N/A	4-6 lf / 0.5"	flowering / 8"	N/A
CYPGP	N/A	N/A	N/A	5 lf / 0.5"	4-5 lf / 10"	4-5 lf / 7"
SEBEX	N/A	N/A	N/A	N/A	3 lf / 8"	5-6 lf / 8"

Conclusions: This study was designed to evaluate several rates of imazethapyr at various application timings alone and in combination with other popular rice herbicides. All treatments effectively controlled broadleaf signalgrass all season. The weakest treatments were the POFL applications on very large grass. Tank mix combinations with propanil (Stam), [acifluorfen + bentazon (Storm)], triclopyr (Grandstand), carfentrazone (Aim), quinclorac (Facet), and propanil (Super Wham) provided excellent control of hemp sesbania. Tank mixes with triclopyr and quinclorac also provided excellent eclipa control. Crop injury was sustained with all POST applications of imazethapyr. However, only the POFL applications decreased yields. This could be due to the weed pressure present prior to application rather than actual injury from herbicide application.

Table 18. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Broadleaf signalgrass (BRAPP)				Carpetweed (MOLVE)	
			6/4	6/15	7/12	7/27	6/4	6/15
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Imazethapyr	0.063	PPI	100	85	91	100	100	94
Imazethapyr	0.094	PPI	100	95	100	100	100	99
Imazethapyr	0.125	PPI	100	98	100	100	100	98
Imazethapyr	0.063	PRE	100	84	95	83	100	100
Imazethapyr	0.094	PRE	100	84	94	89	100	99
Imazethapyr	0.125	PRE	100	90	100	100	100	98
Imazethapyr	0.063	DPRE	100	99	100	100	100	100
Imazethapyr	0.094	DPRE	100	99	100	100	100	100
Imazethapyr	0.125	DPRE	100	100	100	100	100	100
Imazethapyr + AG-98 (0.25%)	0.063	EPOST	0	100	100	100	0	73
Imazethapyr + AG-98 (0.25%)	0.094	EPOST	0	100	100	100	0	75
Imazethapyr + AG-98 (0.25%)	0.125	EPOST	0	100	100	100	0	89
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI PREFL	100	90	100	100	100	93
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.047	PPI PREFL	100	93	100	100	100	95
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	0	0	100	100	0	0
Pendimethalin + imazethapyr	1.0 0.063	DPRE	100	98	100	95	100	96
Imazethapyr + propanil + AG-98 (0.25%)	0.063 3.0	PREFL	0	0	100	100	0	0
Imazethapyr + [bentazon + acifluorfen (Storm)] + AG-98 (0.25%)	0.063 0.75	PREFL	0	0	100	96	0	0
Imazethapyr + triclopyr + AG-98 (0.25%)	0.063 0.25	PREFL	0	0	100	100	0	0

continued

Table 18. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Broadleaf signalgrass (BRAPP)				Carpetweed (MOLVE)	
			6/4	6/15	7/12	7/27	6/4	6/15
Untreated check			0	0	0	0	0	0
Imazethapyr	0.063	PPI	100	85	91	100	100	94
Imazethapyr + carfentrazone + AG-98 (0.25%)	0.063 0.02	PREFL	0	0	100	100	0	0
Imazethapyr + quinclorac + AG-98 (0.25%)	0.063 0.25	PREFL	0	0	100	100	0	0
[Imazaquin + imazethapyr + pendimethalin (Steel)]	0.84	DPRE	100	99	100	95	100	100
Imazethapyr + AG-98 (0.25%) <i>fb</i>	0.063	EPOST						
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	0	100	100	100	0	88
Imazethapyr + AG-98 (0.25%)	0.094	POFL	0	0	100	83	0	0
Imazethapyr + AG-98 (0.25%)	0.125	POFL	0	0	93	85	0	0
Imazethapyr <i>fb</i> propanil + Penetrator Plus (1 pt/A)	0.063 3.0	PREFL	100	96	100	100	100	99
Pendimethalin + quinclorac <i>fb</i> propanil + triclopyr + AG-98 (0.25%)	1.0 0.188 3.0 0.25	DPRE PREFL	100	95	100	100	100	95
LSD (0.05)			1	6	6	9	1	8

continued

Table 18. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Hemp sesbania (SEBEX)		Eclipta (ECLAL)		Barnyard- grass (ECHCG)	Amazon sprangletop (LEFPA)
			7/12	7/27	7/12	7/27	7/27	7/27
Untreated check			0	0	0	0	0	0
Imazethapyr	0.063	PPI	0	0	0	0	100	95
Imazethapyr	0.094	PPI	0	0	0	25	98	99
Imazethapyr	0.125	PPI	0	0	25	0	100	100
Imazethapyr	0.063	PRE	0	0	25	25	96	100
Imazethapyr	0.094	PRE	0	0	0	0	100	98
Imazethapyr	0.125	PRE	0	0	25	25	100	100
Imazethapyr	0.063	DPRE	0	0	25	25	98	100
Imazethapyr	0.094	DPRE	0	20	40	75	100	100
Imazethapyr	0.125	DPRE	0	0	75	75	98	100
Imazethapyr + AG-98 (0.25%)	0.063	EPOST	0	0	0	0	100	100
Imazethapyr + AG-98 (0.25%)	0.094	EPOST	0	0	0	0	100	100
Imazethapyr + AG-98 (0.25%)	0.125	EPOST	0	0	43	25	100	100
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI PREFL	0	0	25	25	100	100
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.047	PPI PREFL	0	0	44	25	100	100
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	0	0	0	0	100	100
Pendimethalin + imazethapyr	1.0 0.063	DPRE	0	25	25	0	98	100
Imazethapyr + propanil + AG-98 (0.25%)	0.063 3.0	PREFL	25	100	95	50	93	95
Imazethapyr + [bentazon + acifluorfen (Storm)] + AG-98 (0.25%)	0.063 0.75	PREFL	100	100	95	75	98	98
Imazethapyr + triclopyr + AG-98 (0.25%)	0.063 0.25	PREFL	100	100	100	100	98	98

continued

Table 18. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Hemp sesbania (SEBEX)		Eclipta (ECLAL)		Barnyard- grass (ECHCG)	Amazon sprangletop (LEFPA)
			7/12	7/27	7/12	7/27	7/27	7/27
			----- (%) -----					
Imazethapyr + carfentrazone + AG-98 (0.25%)	0.063 0.02	PREFL	100	100	65	0	95	100
Imazethapyr + quinclorac + AG-98 (0.25%)	0.063 0.25	PREFL	93	100	100	100	98	98
[Imazaquin + imazethapyr + pendimethalin (Steel)]	0.84	DPRE	100	0	100	75	100	100
Imazethapyr + AG-98 (0.25%) <i>fb</i>	0.063	EPOST						
imazethapyr + AG-98 (0.25%)	0.063	PREFL	0	0	50	25	100	100
Imazethapyr + AG-98 (0.25%)	0.094	POFL	0	0	19	0	90	100
Imazethapyr + AG-98 (0.25%)	0.125	POFL	0	0	18	0	83	100
Imazethapyr <i>fb</i> propanil + Penetrator Plus (1 pt/A)	0.063 3.0	PPI PREFL	100	100	100	100	100	100
Pendimethalin + quinclorac <i>fb</i> propanil + triclopyr + AG-98 (0.25%)	1.0 0.188 3.0 0.25	DPRE PREFL	100	100	100	100	100	100
LSD (0.05)			13	17	46	45	45	3

continued

Table 18. Section 3.

Herbicide (lb/A)	Rate	Application timing	Effect on rice				Yield 8/18 (lb/A)
			Injury				
			6/4	6/15	7/12	7/27	
			----- (%) -----				
Untreated check			0	0	0	0	1845
Imazethapyr	0.063	PPI	0	0	0	0	3195
Imazethapyr	0.094	PPI	0	0	0	0	3915
Imazethapyr	0.125	PPI	0	0	0	0	3510
Imazethapyr	0.063	PRE	0	0	0	0	2970
Imazethapyr	0.094	PRE	0	0	0	0	3375
Imazethapyr	0.125	PRE	0	0	0	0	3375
Imazethapyr	0.063	DPRE	0	0	0	0	3375
Imazethapyr	0.094	DPRE	0	0	0	0	3870
Imazethapyr	0.125	DPRE	0	0	0	0	3780
Imazethapyr + AG-98 (0.25%)	0.063	EPOST	0	31	0	0	3015
Imazethapyr + AG-98 (0.25%)	0.094	EPOST	0	46	8	4	3420
Imazethapyr + AG-98 (0.25%)	0.125	EPOST	0	46	11	6	3555
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI PREFL	0	0	11	4	3465
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.047	PPI PREFL	0	0	4	4	3465
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	0	0	8	5	3285
Pendimethalin + imazethapyr	1.0 0.063	DPRE	0	0	0	0	3780
Imazethapyr + propanil + AG-98 (0.25%)	0.063 3.0	PREFL	0	0	19	10	4635
Imazethapyr + [bentazon + acifluorfen (Storm) + AG-98 (0.25%)	0.063 0.75	PREFL	0	0	9	4	4815
Imazethapyr + triclopyr + AG-98 (0.25%)	0.063 0.25	PREFL	0	0	8	3	4230
Imazethapyr + carfentrazone + AG-98 (0.25%)	0.063 0.02	PREFL	0	0	11	4	3870

continued

Table 18. Section 3. Continued.

Herbicide (lb/A)	Rate	Application timing	Effect on rice				Yield 8/18 (lb/A)
			Injury				
			6/4	6/15	7/12	7/27	
			----- (%) -----				
Imazethapyr + quinclorac + AG-98 (0.25%)	0.063 0.25	PREFL	0	0	9	8	4770
[Imazaquin + imazethapyr + pendimethalin (Steel)]	0.84	DPRE	0	0	0	0	3330
Imazethapyr + AG-98 (0.25%) <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	EPOST PREFL	0	34	16	8	3150
Imazethapyr + AG-98 (0.25%)	0.094	POFL	0	0	25	9	2790
Imazethapyr + AG-98 (0.25%)	0.125	POFL	0	0	23	10	3105
Imazethapyr <i>fb</i> propanil + Penetrator Plus (1 pt/A)	0.063 3.0	PPI PREFL	0	0	0	1	4140
Pendimethalin + quinclorac <i>fb</i> propanil + triclopyr + AG-98 (0.25%)	1.0 0.188 3.0 0.25	DPRE PREFL	0	5	3	0	3780
LSD (0.05)			NS	4	4	4	810

Table 19. Rice injury and weed control with imazethapyr, Lonoke, 1999.**TEST INFORMATION**

Location	Lonoke	Planting date	May 12, 1999
Experimental Design / replications	RCB / 4	Harvest date	August 20, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / 93AS3510
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.4 / 4.8		

Comments: DPRE = delayed preemergence; SPIKE = spiking; 1 LF = 1 leaf rice; 2 LF = 2 leaf rice; and 3 LF = 3 leaf rice.

Application type	DPRE	SPIKE	1 LF	2 LF	3 LF
Date applied	5/17/99	5/24/99	5/26/99	6/1/99	6/2/99
Time	6:50 pm	10:20 am	10:10 am	9:45 am	3:35 pm
Incorporation equipment	N/A	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	82 / 73	70 / 68	74 / 69	73 / 70	93 / 78
Relative humidity (%)	61	57	68	87	58
Wind (mph)	4	5	4	7	4
Weather	cloudy	clear	cloudy	cloudy	partly cloudy
Soil moisture	saturated	saturated	moist	moist	moist
Crop stage/Height	N/A	spike - 1 lf / 1"	1 lf / 1"	2-3 lf / 4"	3 lf / 6"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	16 / 6 / 20	16 / 6 / 20	16 / 6 / 20	18 / 6 / 20	19 / 6 / 20
Gpa / Psi	10 / 23	10 / 19	10 / 18	10 / 18	10 / 18
Weed species	----- (# leaves/height) -----				
CYPCP	N/A	1-2 lf / 0.125"	1 lf / 0.25"	3 lf / 0.5"	4 lf / 2"
BRAPP	N/A	1 lf / 0.25"	1 lf / 0.25"	3 lf / 1.5"	3 lf / 2.5"
MOLVE	N/A	cotyledon / 0.25"	1 lf / 0.125"	4-6 lf / 0.125"	7 lf

Conclusions: There is increasing awareness of crop injury resulting from postemergence use of imazethapyr. This study was designed to determine at which application timing rice is most vulnerable to imazethapyr. No significant injury resulted from DPRE treatments. Slight injury was noted from SPIKE treatments 11 to 22 days after application with 0.094 and 0.125 lb/A. However, the plants recovered, and no significant injury was noted thereafter. The 1 LF application provided some injury at the 0.125 lb/A rate. Again, this injury was not significant later in the season. All the 2 LF and 3 LF imazethapyr treatments significantly injured the rice, and there was a trend toward yield reduction, although yields were not significantly different from most of the other treatments.

Table 19. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Carpetweed (MOLVE)		Broadleaf signalgrass (BRAPP)			Eclipta (ECLAL)	Amazon sprangletop (LEFPA)
			6/4	6/15	6/15	7/12	7/29	7/12	7/12
Untreated check			0	0	0	0	0	0	0
Imazethapyr	0.063	DPRE	100	100	100	100	100	50	100
Imazethapyr	0.094	DPRE	100	100	100	100	100	48	100
Imazethapyr	0.125	DPRE	100	100	100	100	100	75	100
Imazethapyr + AG-98 (0.25%)	0.063	1 LF	100	85	100	100	100	25	100
Imazethapyr + AG-98 (0.25%)	0.094	1 LF	100	96	100	100	100	48	100
Imazethapyr + AG-98 (0.25%)	0.125	1 LF	100	98	100	100	100	75	100
Imazethapyr + AG-98 (0.25%)	0.063	SPIKE	100	89	99	100	100	25	100
Imazethapyr + AG-98 (0.25%)	0.094	SPIKE	100	98	99	100	100	25	100
Imazethapyr + AG-98 (0.25%)	0.125	SPIKE	100	96	100	100	100	50	100
Imazethapyr + AG-98 (0.25%)	0.063	2 LF	54	55	100	100	100	0	100
Imazethapyr + AG-98 (0.25%)	0.094	2 LF	56	51	100	100	100	0	100
Imazethapyr + AG-98 (0.25%)	0.125	2 LF	55	59	100	100	100	0	100
Imazethapyr + AG-98 (0.25%)	0.063	3 LF	13	31	100	100	100	0	100
Imazethapyr + AG-98 (0.25%)	0.094	3 LF	35	54	100	100	100	23	100
Imazethapyr + AG-98 (0.25%)	0.125	3 LF	8	48	100	100	100	0	100
LSD (0.05)			25	25	1	1	1	58	1

continued

Table 19. Section 2.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass (ECHCG)		Effect on rice				
			control	Injury					Yield
			7/29	6/4	6/15	6/21	7/12	7/29	8/20
			----- (%) -----					(lb/A)	
Untreated check			0	0	0	0	0	0	2880
Imazethapyr	0.063	DPRE	100	0	6	0	0	0	4410
Imazethapyr	0.094	DPRE	100	5	4	3	4	0	4410
Imazethapyr	0.125	DPRE	100	8	6	3	0	0	4275
Imazethapyr + AG-98 (0.25%)	0.063	1 LF	100	11	0	1	0	0	4140
Imazethapyr + AG-98 (0.25%)	0.094	1 LF	100	11	10	6	1	0	4410
Imazethapyr + AG-98 (0.25%)	0.125	1 LF	100	19	15	4	3	0	4590
Imazethapyr + AG-98 (0.25%)	0.063	SPIKE	100	9	8	5	1	0	4050
Imazethapyr + AG-98 (0.25%)	0.094	SPIKE	100	15	8	3	0	0	4050
Imazethapyr + AG-98 (0.25%)	0.125	SPIKE	100	14	8	6	6	0	4140
Imazethapyr + AG-98 (0.25%)	0.063	2 LF	100	10	31	18	11	0	3465
Imazethapyr + AG-98 (0.25%)	0.094	2 LF	100	11	38	18	16	0	3600
Imazethapyr + AG-98 (0.25%)	0.125	2 LF	100	14	43	21	18	3	3555
Imazethapyr + AG-98 (0.25%)	0.063	3 LF	100	8	28	14	5	0	3465
Imazethapyr + AG-98 (0.25%)	0.094	3 LF	100	5	44	26	20	3	3465
Imazethapyr + AG-98 (0.25%)	0.125	3 LF	100	5	39	25	23	3	3600
LSD (0.05)			1	10	12	6	6	2	945

Table 20. Weed control in IMI-rice without flooding, Lonoke, 1999.

TEST INFORMATION

Location	Lonoke	Planting date	May 12, 1999
Experimental Design / replications	RCB / 4	Harvest date	August 20, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / 93AS3510
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.4 / 4.8		

Comments: PPI = preplant incorporated; PRE = preemergence; DPRE = delayed preemergence; EPOST = early postemergence; and PREFL = pre-flood. IMI-rice = rice tolerant to the imidazolinone herbicide imazethapyr.

Application type	PPI	PRE	DPRE	EPOST	PREFL
Date applied	5/12/99	5/13/88	5/18/99	6/2/99	6/16/99
Time	11:30 am	10:30 am	2:30 pm	5:10 pm	4:20 pm
Incorporation equipment	field cultivator	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	95 / 72	72 / 68	94 / 75	93 / 80	92 / 80
Relative humidity (%)	30	41	29	53	26
Wind (mph)	6	7	4	2	7
Weather	mostly clear	clear	clear	partly cloudy	clear
Soil moisture	dry	dry	saturated	damp	moist
Crop stage/Height	N/A	N/A	N/A	4 lf / 5.5"	2 tiller / 14"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/ Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	16 / 6 / 20	16 / 6 / 20	16 / 6 / 20	19 / 6 / 20	26 / 6 / 20
Gpa / Psi	10 / 19	10 / 19	10 / 19	10 / 18	10 / 13
Weed species	----- [# leaves/height in.] -----				
BRAPP	N/A	N/A	N/A	1-2 lf / 0.5"	4 lf - 2 tiller / 5"
MOLVE	N/A	N/A	N/A	4-6 lf / 0.25"	N/A
ECLAL	N/A	N/A	N/A	N/A	4-5 lf / 2"

Conclusions: This study was initiated to evaluate weed control with imazethapyr in a rice field situation where a constant flood was not maintained. The study was planted and flushed to obtain a stand as in normal rice culture. The study was then flooded for only 24 to 48 hours and drained several times during the growing season to maintain rice growth. The delayed preemergence treatment and the soil-applied followed by postemergence sequentials, provided excellent season-long control of the weed species present. Rice producers maintain floods on their fields to aid in weed control. However, in some extended dry situations, this may not be possible. This study indicates that in such drought situations, imazethapyr will provide excellent weed control season-long.

Table 20. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Broadleaf signalgrass (BRAPP)				Carpetweed (MOLVE)	
			6/4	6/15	7/12	7/27	6/4	6/15
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Imazethapyr	0.063	PPI	100	91	89	61	98	100
Imazethapyr	0.063	PRE	100	90	83	59	94	98
Imazethapyr	0.063	DPRE	100	98	96	95	100	100
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI EPOST	100	100	100	100	100	99
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI PREFL	100	90	100	100	90	100
Imazethapyr <i>fb</i> imazethapyr + propanil + Penetrator Plus (1 pt/A)	0.063 0.063 4.0	PPI EPOST	100	100	100	100	100	100
Clomazone <i>fb</i> propanil + halosulfuron + Penetrator Plus (1 pt/A)	0.4 4.0 0.047	PRE EPOST	100	100	100	100	100	100
LSD (0.05)			1	2	9	19	5	2

continued

Table 20. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Annual sedge (CYPCP)		Barnyardgrass (ECHCG)		Eclipta (ECLAL)	Amazon sprangletop (LEFPA)
			6/4	6/15	7/12	7/27	7/12	7/12
Untreated check			0	0	0	0	0	0
Imazethapyr	0.063	PPI	100	100	96	85	100	100
Imazethapyr	0.063	PRE	100	100	94	84	50	100
Imazethapyr	0.063	DPRE	100	100	100	98	100	100
Imazethapyr <i>fb</i>	0.063	PPI						
imazethapyr + AG-98 (0.25%)	0.063	EPOST	100	100	100	100	98	100
Imazethapyr <i>fb</i>	0.063	PPI						
imazethapyr + AG-98 (0.25%)	0.063	PREFL	100	100	100	100	48	100
Imazethapyr <i>fb</i>	0.063	PPI						
imazethapyr + propanil + Penetrator Plus (1 pt/A)	0.063 4.0	EPOST	100	100	100	100	100	100
Clomazone <i>fb</i>	0.4	PRE						
propanil + halosulfuron + Penetrator Plus (1 pt/A)	4.0 0.047	EPOST	100	100	100	100	100	100
LSD (0.05)			1	1	4	9	44	1

continued

Table 20. Section 3.

Herbicide	Rate (lb/A)	Application timing	Effect on rice				Yield 8/20 (lb/A)
			Injury				
			6/4	6/15	7/12	7/27	
Untreated check			0	0	0	0	1215
Imazethapyr	0.063	PPI	3	0	0	0	1935
Imazethapyr	0.063	PRE	3	0	0	3	1980
Imazethapyr	0.063	DPRE	3	3	4	6	2025
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI EPOST	14	24	13	11	1800
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI PREFL	0	0	23	21	1485
Imazethapyr <i>fb</i> imazethapyr + propanil + Penetrator Plus (1 pt/A)	0.063 0.063 4.0	PPI EPOST	15	23	11	14	2160
Clomazone <i>fb</i> propanil + halosulfuron + Penetrator Plus (1 pt/A)	0.4 4.0 0.047	PRE EPOST	15	8	6	9	2025
LSD (0.05)			5	5	7	9	585

Table 21. Sequential application of imazethapyr for control of red rice and other common weeds in IMI-rice, Stuttgart, 1999.

TEST INFORMATION

Location	Stuttgart	Planting date	May 19, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 7, 1999
Plot size	7 ft by 20 ft	Crop / Variety	Rice / 93AS3510
Row width / Number of rows per plot	7 in. / 9 rows	Dates of flushing	May 25, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	July 2, 1999
% OM / pH	1.4 / 4.8		

Comments: Treatment 24 did not receive the PREFL treatment. PPI = preplant incorporated; PRE = preemergence; 2-3 LF = 2-3 leaf rice; and PREFL = pre flood. IMI-rice = rice tolerant to the imidazolinone herbicide imazethapyr (Pursuit).

Application type	PPI	PRE	2-3 LF	PREFL
Date applied	5/19/99	5/19/99	6/7/99	6/11/99
Time	2:00 pm	4:30 pm	11:25 am	11:55 am
Incorporation equipment	field cultivator	N/A	N/A	N/A
Air/Soil temperature (F)	88 / 84	87 / 80	94 / 79	88 / 83
Relative humidity (%)	31	36	59	82
Wind (mph)	3	1	6	0
Weather	clear	clear	mostly cloudy	clear
Soil moisture	moist	moist	saturated	dry
Crop stage/Height	N/A	N/A	3 lf / 4.5"	4 lf / 8"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	16 / 4 / 20	16 / 4 / 20	20 / 4 / 20	19 / 4 / 20
Gpa / Psi	10 / 18	10 / 18	10 / 20	10 / 20
Weed species	----- [# leaves/height (in.)] -----			
SIDSP	N/A	N/A	cotyledon / 0.25"	N/A
ORYSA	N/A	N/A	4 lf / 7"	4 lf / 5"

Conclusions: Due to increasing concern over postemergence crop injury with imazethapyr, it was proposed that an increased soil-applied rate, followed by a decreased foliar rate, would help alleviate the injury problem. This study evaluates 0.032, 0.047, and 0.063 POST rates alone and in combination with 0.063 and 0.094 soil-applied rates. This study also evaluated the efficacy of these rates on red rice control. All of the soil followed by POST and POST sequentials provided excellent control of red rice. There was a trend for the lower two rates (0.032 and 0.047) to cause less crop injury than the 0.063 rate at the 2-3 LF stage. However there was also a trend for the 0.094 soil-applied treatments to cause more injury following the 2-3 LF treatments. The results are somewhat inconclusive, and the study will be repeated in 2000.

Table 21. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Red rice (ORYSA)				Barnyardgrass (ECHCG)		
			6/4	6/18	6/25	7/7	8/3	7/7	8/3
Untreated check			0	0	0	0	0	0	0
Imazethapyr + AG-98 (0.25%)	0.032	2-3 LF	0	70	71	63	66	90	91
Imazethapyr + AG-98 (0.25%)	0.047	2-3 LF	0	66	71	58	58	75	65
Imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	0	68	69	66	85	90	93
Imazethapyr	0.063	PPI	88	83	86	66	74	90	100
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.032	PPI 2-3 LF	84	85	90	74	95	90	100
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.047	PPI 2-3 LF	84	90	95	81	96	91	100
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI 2-3 LF	80	88	95	94	99	93	100
Imazethapyr	0.094	PPI	89	91	88	76	83	90	100
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.094 0.032	PPI 2-3 LF	88	91	96	86	100	93	100
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.094 0.047	PPI 2-3 LF	89	89	96	88	96	91	100
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.094 0.063	PPI 2-3 LF	91	93	99	85	99	91	100
Imazethapyr	0.063	PRE	63	71	64	53	33	88	100
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.032	PRE 2-3 LF	70	81	86	75	95	91	100
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.047	PRE 2-3 LF	74	80	80	80	95	89	100
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PRE 2-3 LF	78	80	89	79	98	90	100
Imazethapyr	0.094	PRE	83	81	84	73	65	90	75

continued

Table 21. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Red rice (ORYSA)					Barnyardgrass (ECHCG)	
			6/4	6/18	6/25	7/7	8/3	7/7	8/3
			----- (%) -----						
Imazethapyr <i>fb</i>	0.094	PRE							
imazethapyr + AG-98 (0.25%)	0.032	2-3 LF	80	85	91	76	96	88	100
Imazethapyr <i>fb</i>	0.094	PRE							
imazethapyr + AG-98 (0.25%)	0.047	2-3 LF	81	84	95	84	100	91	100
Imazethapyr <i>fb</i>	0.094	PRE							
imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	83	91	99	90	98	94	100
Imazethapyr + AG-98 (0.25%) <i>fb</i>	0.063	2-3 LF							
imazethapyr + AG-98 (0.25%)	0.047	PREFL	0	68	70	75	99	89	100
Imazethapyr + AG-98 (0.25%) <i>fb</i>	0.063	2-3 LF							
imazethapyr + AG-98 (0.25%)	0.063	PREFL	0	65	73	76	99	89	100
Imazethapyr <i>fb</i>	0.063	PPI							
imazethapyr + AG-98 (0.25%)	0.047	PREFL	83	83	88	78	98	90	98
Imazethapyr	0.063	PPI	21	33	54	43	53	48	75
Imazethapyr <i>fb</i>	0.063	PRE							
imazethapyr + AG-98 (0.25%)	0.047	PREFL	85	89	98	85	95	91	100
Imazethapyr <i>fb</i>	0.063	PRE							
imazethapyr + AG-98 (0.25%)	0.063	PREFL	75	80	84	74	99	88	100
LSD (0.05)			14	13	11	11	15	10	25

continued

Table 21. Section 2.

Herbicide	Application		Eclipta (ECLAL)		Effect on rice					Yield 9/7 (lb/A)	
	Rate (lb/A)	timing	control		Injury						
			7/7	8/3	6/4	6/18	6/25	7/7	8/3		
Untreated check			0	75	0	0	0	0	0	0	1125
Imazethapyr + AG-98 (0.25%)	0.032	2-3 LF	69	44	0	6	4	5	0		2430
Imazethapyr + AG-98 (0.25%)	0.047	2-3 LF	45	0	0	3	3	9	0		2205
Imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	63	0	0	6	0	3	0		3285
Imazethapyr	0.063	PPI	68	40	11	0	0	0	0		3240
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.032	PPI 2-3 LF									
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.047	PPI 2-3 LF	73	63	3	3	0	0	0		3690
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI 2-3 LF	86	69	0	6	5	6	0		3600
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI 2-3 LF	84	89	5	9	0	0	0		4635
Imazethapyr	0.094	PPI	80	90	4	0	0	0	0		4095
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.094 0.032	PPI 2-3 LF									
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.094 0.047	PPI 2-3 LF	89	100	9	15	3	4	0		4230
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.094 0.047	PPI 2-3 LF	89	95	3	11	0	4	0		4890
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.094 0.063	PPI 2-3 LF	88	75	6	18	3	5	0		4230
Imazethapyr	0.063	PRE	60	50	0	0	0	0	0		1530
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.032	PRE 2-3 LF									
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.047	PRE 2-3 LF	78	25	0	6	0	1	0		3960
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.047	PRE 2-3 LF	85	64	0	6	0	1	0		3915
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PRE 2-3 LF	81	63	0	16	3	0	0		4140
Imazethapyr	0.094	PRE	81	75	11	0	3	3	0		3645

continued

Table 21. Section 2. Continued.

Herbicide	Application		Eclipta (ECLAL)		Effect on rice					Yield 9/7 (lb/A)
	Rate (lb/A)	timing	control		Injury					
			7/7	8/3	6/4	6/18	6/25	7/7	8/3	
Imazethapyr <i>fb</i>	0.094	PRE								
imazethapyr + AG-98 (0.25%)	0.032	2-3 LF	84	50	0	3	0	3	0	4320
Imazethapyr <i>fb</i>	0.094	PRE								
imazethapyr + AG-98 (0.25%)	0.047	2-3 LF	91	93	3	5	0	0	0	4455
Imazethapyr <i>fb</i>	0.094	PRE								
imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	90	75	10	23	10	4	0	4365
Imazethapyr + AG-98 (0.25%) <i>fb</i>	0.063	2-3 LF								
imazethapyr + AG-98 (0.25%)	0.047	PREFL	83	64	0	5	3	8	0	4455
Imazethapyr + AG-98 (0.25%) <i>fb</i>	0.063	2-3 LF								
imazethapyr + AG-98 (0.25%)	0.063	PREFL	79	21	0	13	8	13	0	4185
Imazethapyr <i>fb</i>	0.063	PPI								
imazethapyr + AG-98 (0.25%)	0.047	PREFL	74	18	0	1	3	5	0	4230
Imazethapyr <i>fb</i>	0.063	PPI	61	20	0	0	4	28	0	3105
Imazethapyr <i>fb</i>	0.063	PRE								
imazethapyr + AG-98 (0.25%)	0.047	PREFL	89	98	5	4	3	8	0	4500
Imazethapyr <i>fb</i>	0.063	PRE								
imazethapyr + AG-98 (0.25%)	0.063	PREFL	78	58	0	3	6	6	0	4635
LSD (0.05)			14	55	5	6	7	7	0	945

Table 22. Red rice control in IMI-tolerant rice, Stuttgart, 1999.

TEST INFORMATION

Location	Stuttgart	Planting date	May 19, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 7, 1999
Plot size	7 ft by 20 ft	Crop / Variety	Rice / 93AS3510
Row width / Number of rows per plot	7 in. / 9 rows	Dates of flushing	May 25, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	July 2, 1999
% OM / pH	1.6 / 4.2		

Comments: PPI = preplant incorporated; PRE = preemergence; DPRE = delayed preemergence; EPOST = early postemergence; PREFL = pre flood; and POFL = post flood. IMI-tolerant = rice tolerant to the imidazolinone herbicide imazethapyr (Pursuit).

Application type	PPI	PRE	DPRE	EPOST	PREFL	POFL
Date applied	5/19/99	5/19/99	5/25/99	6/4/99	6/11/99	7/7/99
Time	1:45 pm	4:15 pm	10:40 am	12:30 pm	11:30 am	10:45 am
Incorporation equipment	roto-tiller	N/A	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	87 / 84	87 / 80	78 / 74	91 / 79	88 / 83	85 / 80
Relative humidity (%)	31	36	60	66	82	76
Wind (mph)	3	2	4	6	3	3
Weather	clear	clear	cloudy	cloudy	mostly clear	clear
Soil moisture	moist	moist	dry	saturated	dry	flooded
Crop stage/Height	N/A	N/A	spiking / 0.35"	3 lf / 4.5"	4 lf / 6"	5 tiller / 20"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	18 / 4 / 20	16 / 4 / 20	16 / 4 / 20	20 / 4 / 20	18 / 4 / 20	32 / 4 / 20
Gpa / Psi	10 / 18	10 / 18	10 / 14	10 / 20	10 / 20	10 / 11
Weed species	----- (# leaves/height) -----					
ORYSA	N/A	N/A	spike - 1 lf / 0.35"	4 lf / 7"	5 lf / 6"	over 2 ft
BRAPP	N/A	N/A	1-2 lf / 0.5"	N/A	N/A	N/A
SIDSP	N/A	N/A	cotyledon / 0.25"	cotyledon / 0.25"	1 lf / 0.5"	adult / 13"

Conclusions: This study is a repeat of the 1998 red rice weed control study located near Stuttgart, Arkansas, at the Rice Research and Extension Center. Control of red rice was achieved with the sequential programs. Both PPI followed by POST and POST sequential provided excellent red rice control as well as control of other grass weeds. Some crop injury was noted with the POST applications of imazethapyr. The injury was not as severe in this study as it had been in other studies. There was a yield decrease with the imazethapyr POFL applications, due to the intense weed pressure in the plots.

Table 22. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Red rice (ORYSA)					Barnyardgrass (ECHCG)	Eclipta (ECLAL)
			6/4	6/18	6/25	7/7	8/3	7/7	7/7
			----- (%) -----						
Untreated check			0	0	0	0	0	0	0
Imazethapyr	0.063	PPI	80	88	80	78	74	93	80
Imazethapyr	0.094	PPI	93	96	96	88	96	95	94
Imazethapyr	0.125	PPI	91	98	99	89	98	95	88
Imazethapyr	0.063	PRE	76	86	75	66	61	95	84
Imazethapyr	0.094	PRE	76	91	84	69	73	95	91
Imazethapyr	0.125	PRE	81	93	93	84	84	95	95
Imazethapyr	0.063	DPRE	69	64	56	45	35	63	43
Imazethapyr	0.094	DPRE	81	95	94	81	78	94	88
Imazethapyr	0.125	DPRE	80	94	95	84	86	94	88
Imazethapyr + AG-98 (0.25%)	0.063	EPOST	0	75	81	69	81	91	48
Imazethapyr + AG-98 (0.25%)	0.094	EPOST	0	78	81	74	95	83	58
Imazethapyr + AG-98 (0.25%)	0.125	EPOST	0	70	81	83	99	86	80
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI PREFL	75	88	89	84	100	95	85
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.047	PPI PREFL	84	90	95	83	98	95	89
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	0	28	45	33	54	33	33
Pendimethalin + imazethapyr	1.0 0.063	DPRE	79	88	83	69	66	90	81
Imazethapyr + propanil + AG-98 (0.25%)	0.063 3.0	PREFL	0	49	65	44	85	60	49
Imazethapyr + [bentazon + acifluorfen (Storm)] + AG-98 (0.25%)	0.063 0.75	PREFL	0	25	50	39	55	39	39
Imazethapyr + triclopyr + AG-98 (0.25%)	0.063 0.25	PREFL	0	34	38	40	35	45	55

continued

Table 22. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Red rice (ORYSA)					Barnyardgrass (ECHCG)	Eclipta (ECLAL)
			6/4	6/18	6/25	7/7	8/3	7/7	7/7
			----- (%) -----						
Imazethapyr + carfentrazone + AG-98 (0.25%)	0.063 0.02	PREFL	0	16	48	38	43	38	36
Imazethapyr + quinclorac + AG-98 (0.25%)	0.063 0.25	PREFL	0	25	43	41	54	41	93
[Imazaquin + imazethapyr + pendimethalin (Steel)]	0.84	DPRE	88	94	93	70	84	89	89
Imazethapyr + AG-98 (0.25%) <i>fb</i>	0.063	EPOST							
imazethapyr + AG-98 (0.25%)	0.063	PREFL	0	79	86	86	99	94	71
Imazethapyr + AG-98 (0.25%)	0.094	POFL	0	0	0	0	93	0	0
Imazethapyr + AG-98 (0.25%)	0.125	POFL	0	0	0	0	93	0	0
Imazethapyr <i>fb</i> propanil + Penetrator Plus (1 pt/A)	0.063 3.0	PPI PREFL	86	91	90	73	78	95	94
Pendimethalin + quinclorac <i>fb</i> propanil + triclopyr + AG-98 (0.25%)	1.0 0.188 3.0 0.25	DPRE PREFL	0	0	0	0	0	0	0
LSD (0.05)			6	17	18	14	16	18	17

continued

Table 22. Section 2.

Herbicide	Rate (lb/A)	Application timing	Effect on rice						Yield 9/7 (lb/A)
			Injury						
			6/4	6/11	6/18	6/25	7/7	8/3	
			----- (%) -----						
Untreated check			0	0	0	0	0	0	1035
Imazethapyr	0.063	PPI	3	0	0	3	1	0	3780
Imazethapyr	0.094	PPI	10	0	0	0	0	0	4275
Imazethapyr	0.125	PPI	5	0	0	0	5	0	4230
Imazethapyr	0.063	PRE	3	0	0	0	8	0	3150
Imazethapyr	0.094	PRE	0	0	0	0	5	0	3375
Imazethapyr	0.125	PRE	16	3	0	0	5	0	4455
Imazethapyr	0.063	DPRE	0	0	0	0	3	0	2520
Imazethapyr	0.094	DPRE	5	0	0	3	10	0	3240
Imazethapyr	0.125	DPRE	13	0	0	0	4	0	4140
Imazethapyr + AG-98 (0.25%)	0.063	EPOST	0	14	15	19	5	0	2925
Imazethapyr + AG-98 (0.25%)	0.094	EPOST	0	15	20	19	13	0	4230
Imazethapyr + AG-98 (0.25%)	0.125	EPOST	0	15	25	19	15	8	3870
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI PREFL	0	0	3	13	4	0	4185
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.047	PPI PREFL	5	0	0	15	3	0	4095
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	0	0	4	8	28	0	2700
Pendimethalin + imazethapyr	1.0 0.063	DPRE	3	0	0	0	3	0	3735
Imazethapyr + propanil + AG-98 (0.25%)	0.063 3.0	PREFL	0	0	11	24	20	0	3690
Imazethapyr + [bentazon + acifluorfen (Storm) + AG-98 (0.25%)	0.063 0.75	PREFL	0	0	0	13	23	0	2475
Imazethapyr + triclopyr + AG-98 (0.25%)	0.063 0.25	PREFL	0	0	4	11	30	0	2250
Imazethapyr + carfentrazone + AG-98 (0.25%)	0.063 0.02	PREFL	0	0	0	20	36	5	2340

continued

Table 22. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Effect on rice						Yield 9/7 (lb/A)
			Injury						
			6/4	6/11	6/18	6/25	7/7	8/3	
			----- (%) -----						
Imazethapyr + quinclorac + AG-98 (0.25%)	0.063 0.25	PREFL	0	0	0	10	21	0	2835
[Imazaquin + imazethapyr + pendimethalin (Steel)	0.84	DPRE	5	0	0	0	5	0	3960
Imazethapyr + AG-98 (0.25%) <i>fb</i>	0.063	EPOST							
imazethapyr + AG-98 (0.25%)	0.063	PREFL	0	13	26	28	8	0	3915
Imazethapyr + AG-98 (0.25%)	0.094	POFL	0	0	0	0	0	88	900
Imazethapyr + AG-98 (0.25%)	0.125	POFL	0	0	0	0	0	89	855
Imazethapyr <i>fb</i> propanil + Penetrator Plus (1 pt/A)	0.063 3.0	PPI PREFL	0	0	0	0	0	0	4230
Pendimethalin + quinclorac <i>fb</i> propanil + triclopyr + AG-98 (0.25%)	1.0 0.188 3.0 0.25	DPRE PREFL	0	0	0	0	0	0	1215
LSD (0.05)			5	1	4	8	8	5	855

Table 23. Red rice control in IMI rice, Rohwer, 1999.

TEST INFORMATION

Location	Rohwer	Planting date	May 12, 1999
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	5 ft by 35 ft	Crop / Variety	Rice / IMI
Row width / Number of rows per plot	6 in. / 8 rows	Dates of flushing	May 17, 20, 25, June 8, and 13, 1999
Soil type	clay loam (8% sand, 49% silt, 43% clay)	Date of flooding	July 1, 1999
% OM / pH	3.5 / 6.7		

Comments: PPI = preplant incorporated; PRE = preemergence; EPOST = early postemergence; and PREFL = pre flood.

Application type	PPI	PRE	EPOST	PREFL
Date applied	5/12/99	5/12/99	6/7/99	7/2/99
Time	1:00 pm	3:00 pm	7:30 am	8:00 am
Incorporation equipment		N/A	N/A	N/A
Air/Soil temperature (F)	75 / 68	75 / 68	80 / 76	78 / 74
Relative humidity (%)	30	30	90	75
Wind (mph)	6	6	1	4
Weather	cloudy	cloudy	clear	
Soil moisture	dry	dry	optimal	optimal
Crop stage/Height	N/A	N/A	3.5"	8"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Flat fan / 8002	Flat fan / 8002	Flat fan / 8002	Flat fan / 8002
Boom ht / # Noz / Spacing (in.)	22 / 3 / 19	22 / 3 / 19	22 / 3 / 19	22 / 3 / 19
Gpa / Psi	15 / 22	15 / 22	15 / 24	15 / 24
Weed species	-----(# leaves)-----			
ORYSA	N/A	N/A	2-3 lf	4-6 lf

Conclusions: Sequential applications of imazethapyr (Pursuit) provided 100 or near 100% control of red rice without permanent stunting. PPI and PRE applications of imazethapyr failed to provide the near 100% season-long control of red rice. However, the PPI treatments were superior to the PRE treatments. A rate response was also noted. Imazethapyr at 0.063 + 0.063 lb ai/A applied PPI *fb* EPOST, PPI *fb* PREFL, and PRE *fb* PREFL provided 100% control of the red rice at harvest. The PREFL applications caused 15 to 20% temporary stunting of the rice. No stunting was noted at maturity.

Table 23.

Herbicide	Rate (lb/A)	Application timing	Red rice (ORYSA) control				Rice stunting			
			6/7	7/2	7/14	8/5	6/7	7/2	7/14	8/5
			----- (%) -----							
Untreated check			0	0	0	0	0	0	0	0
Imazethapyr	0.063	PPI	94	85	86	80	3	0	0	0
Imazethapyr	0.094	PPI	93	94	93	91	3	0	0	0
Imazethapyr	0.125	PPI	97	96	95	91	0	0	0	0
Imazethapyr	0.063	PRE	81	45	49	39	0	0	0	0
Imazethapyr	0.094	PRE	91	90	83	69	0	0	0	0
Imazethapyr	0.125	PRE	91	84	92	75	0	0	0	0
Imazethapyr + A-98 (0.25%)	0.063	EPOST	0	71	76	63	0	0	5	0
Imazethapyr + AG-98 (0.25%)	0.094	EPOST	0	93	91	75	0	0	1	0
Imazethapyr + AG-98 (0.25%)	0.125	EPOST	0	95	94	90	0	0	3	0
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI EPOST	91	97	94	100	0	0	0	0
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PRE EPOST	83	96	96	94	3	0	0	0
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI PREFL	93	79	94	100	0	0	16	0
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PRE PREFL	91	83	87	100	0	0	19	0

continued

Herbicide Evaluation in Arkansas Rice, 1999

Table 23. Continued.

Herbicide	Rate (lb/A)	Application timing	Red rice (ORYSA) control				Rice stunting			
			6/7	7/2	7/14	8/5	6/7	7/2	7/14	8/5
			----- (%) -----							
Pendimethalin + quinclorac <i>fb</i>	1.0 0.5	EPOST								
propanil + triclopyr +	4.0 0.25									
Penetrator Plus (1 pt/A)		PREFL	0	8	0	18	0	0	0	0
Clomazone <i>fb</i>	0.5	PRE								
(bensulfuron + propanil) + Penetrator Plus (1 pt/A)	4.03	PREFL	0	13	0	0	0	0	0	0
Imazethapyr <i>fb</i>	0.063	PRE								
propanil + Penetrator Plus (1 pt/A)	4.0	PREFL	78	51	43	53	0	0	0	0
Imazethapyr <i>fb</i>	0.063	PRE								
propanil + imazethapyr + Penetrator Plus (1 pt/A)	4.0 0.063	PREFL	86	61	93	96	0	0	13	0
Imazethapyr <i>fb</i>	0.063	PRE								
triclopyr + AG-98 (0.25%)	0.25	PREFL	84	39	86	68	0	0	0	0
Imazethapyr <i>fb</i>	0.063	PRE								
triclopyr + imazethapyr + AG-98 (0.25%)	0.25 0.063	PREFL	83	33	80	91	0	0	8	0
LSD (0.05)			7	15	17	14	NS	NS	3	NS

Table 24. Propanil for for postemergence weed control in IMI-tolerant rice, Lonoke, 1999.**TEST INFORMATION**

Location	Lonoke	Planting date	May 12, 1999
Experimental Design / replications	RCB / 4	Harvest date	August 20, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / 93AS3510
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.3 / 5.1		

Comments: PPI = preplant incorporated; and PREFL = prelood. IMI-tolerant = tolerant to the imidazolinone herbicide imazethapyr.

Application type	PPI	PREFL
Date applied	5/12/99	6/14/99
Time	10:30 am	10:30 pm
Incorporation equipment	Field cultivator	N/A
Air/Soil temperature (F)	73 / 67	80 / 76
Relative humidity (%)	70	68
Wind (mph)	6	6
Weather	partly cloudy	clear
Soil moisture	dry	moist
Crop stage/Height	N/A	2 tiller / 14"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	16 / 6 / 20	26 / 6 / 20
Gpa / Psi	10 / 19	10 / 23
Weed species	----- [# leaves/height (in.)]-----	
BRAPP	N/A	1 tiller / 3"
SEBEX	N/A	4 lf / 1"
ECLAL	N/A	4 lf / 2"

Conclusions: Propanil (Stam) can be an effective herbicide to use in a program with imazethapyr (Pursuit), to control broadleaf weeds such as hemp sesbania and northern jointvetch.

Table 24. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Broadleaf signalgrass (BRAPP)		Barnyardgrass (ECHCG)		Eclipta (ECLAL)	
			7/12	7/29	7/12	7/29	7/12	7/29
Untreated check			0	0	0	0	0	0
Imazethapyr <i>fb</i>	0.03	PPI						
propanil	4.0	PREFL	100	100	95	83	100	100
Imazethapyr <i>fb</i>	0.03	PPI						
propanil +	4.0							
quinclorac	0.25	PREFL	100	100	100	100	100	100
Imazethapyr <i>fb</i>	0.03	PPI						
propanil +	4.0							
pendimethalin	1.0	PREFL	100	100	100	91	100	100
Imazethapyr <i>fb</i>	0.03	PPI						
propanil +	4.0							
bispyribac-sodium +	0.019							
Kinetic (0.125%)		PREFL	100	100	100	100	100	100
Imazethapyr <i>fb</i>	0.03	PPI						
(propanil + molinate)	6.0	PREFL	100	100	93	88	100	100
Imazethapyr <i>fb</i>	0.03	PPI						
propanil +	3.0							
Imazethapyr	0.06	PREFL	100	100	100	100	100	100
Imazethapyr	0.03	PPI	55	88	68	85	45	0
Imazethapyr <i>fb</i>	0.06	PPI						
propanil	4.0	PREFL	100	100	100	98	100	75
Imazethapyr <i>fb</i>	0.06	PPI						
propanil +	4.0							
quinclorac	0.25	PREFL	100	100	100	100	100	100
Imazethapyr <i>fb</i>	0.06	PPI						
propanil +	4.0							
pendimethalin	1.0	PREFL	100	100	100	94	100	100
Imazethapyr <i>fb</i>	0.06	PPI						
propanil +	4.0							
bispyribac-sodium +	0.019							
Kinetic (0.125%)		PREFL	100	100	100	100	100	100
Imazethapyr <i>fb</i>	0.06	PPI						
(propanil + molinate)	6.0	PREFL	100	100	100	100	100	100
Imazethapyr <i>fb</i>	0.06	PPI						
propanil +	3.0							
imazethapyr	0.06	PREFL	100	100	100	100	100	100
Imazethapyr	0.06	PPI	100	88	98	96	50	25
Propanil	4.0	PREFL	83	100	30	18	100	100

continued

Table 24. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Broadleaf signalgrass (BRAPP)		Barnyardgrass (ECHCG)		Eclipta (ECLAL)	
			7/12	7/29	7/12	7/29	7/12	7/29
			----- (%) -----					
Propanil + quinclorac	4.0 0.25	PREFL	68	100	93	95	100	100
Propanil + pendimethalin	4.0 1.0	PREFL	100	100	10	0	100	100
Propanil + bispyribac-sodium + Kinetic (0.125%)	4.0 0.019	PREFL	93	100	100	95	100	100
(Propanil + molinate)	6.0	PREFL	100	100	10	0	100	100
Propanil + imazethapyr	3.0 0.06	PREFL	100	100	100	100	100	100
LSD (0.05)			21	8	12	20	24	25

continued

Table 24. Section 2.

Herbicide	Rate (lb/A)	Application timing	Amazon sprangletop (LEFPA) control		Effect on rice			Yield 8/20 (lb/A)
			7/12	7/29	Injury			
			7/12	7/29	6/21	7/12	7/9	
			----- (%) -----					
Untreated check			0	0	0	0	0	1800
Imazethapyr <i>fb</i> propanil	0.03 4.0	PPI PREFL	100	100	4	0	0	3870
Imazethapyr <i>fb</i> propanil + quinclorac	0.03 4.0 0.25	PPI PREFL	100	100	5	0	0	4095
Imazethapyr <i>fb</i> propanil + pendimethalin	0.03 4.0 1.0	PPI PREFL	100	98	6	0	0	4275
Imazethapyr <i>fb</i> propanil + bispyribac-sodium + Kinetic (0.125%)	0.03 4.0 0.019	PPI PREFL	100	100	5	0	0	4275

continued

Table 24. Section 2.

Herbicide	Rate (lb/A)	Application timing	Amazon sprangletop (LEFPA) control		Effect on rice			Yield 8/20 (lb/A)
			7/12	7/29	Injury			
			-----		6/21	7/12	7/9	
				----- (%) -----				
Imazethapyr <i>fb</i> (propanil + molinate)	0.03 6.0	PPI PREFL	100	98	5	0	0	4320
Imazethapyr <i>fb</i> propanil + imazethapyr	0.03 3.0 0.06	PPI PREFL	98	96	16	24	5	4320
Imazethapyr	0.03	PPI	43	36	1	0	0	3060
Imazethapyr <i>fb</i> propanil	0.06 4.0	PPI PREFL	100	99	5	0	0	4095
Imazethapyr <i>fb</i> propanil + quinclorac	0.06 4.0 0.25	PPI PREFL	100	100	5	0	1	4230
Imazethapyr <i>fb</i> propanil + pendimethalin	0.06 4.0 1.0	PPI PREFL	100	99	9	0	0	4005
Imazethapyr <i>fb</i> propanil + bispyribac-sodium + Kinetic (0.125%)	0.06 4.0 0.019	PPI PREFL	100	100	5	0	0	3960
Imazethapyr <i>fb</i> (propanil + molinate)	0.06 6.0	PPI PREFL	100	100	5	0	0	4050
Imazethapyr <i>fb</i> propanil + imazethapyr	0.06 3.0 0.06	PPI PREFL	98	96	20	29	10	3870
Imazethapyr	0.06	PPI	73	71	0	0	0	3600
Propanil	4.0	PREFL	35	50	6	0	0	3600
Propanil + quinclorac	4.0 0.25	PREFL	88	70	9	0	1	4140
Propanil + pendimethalin	4.0 1.0	PREFL	69	80	8	0	0	3105
Propanil + bispyribac-sodium + Kinetic (0.125%)	4.0 0.019	PREFL	89	88	6	0	0	4230
(Propanil + molinate)	6.0	PREFL	85	93	8	0	0	3195
Propanil + imazethapyr	3.0 0.06	PREFL	88	78	19	25	10	3915
LSD (0.05)			25	24	4	2	2	630

Table 25. Grass weed control with imazethapyr in IMI-tolerant rice, Stuttgart, 1999.

TEST INFORMATION

Location	Stuttgart	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 8, 1999
Plot size	6 ft by 16 ft	Crop / Variety	Rice / IMI-Tolerant (Clearfield)
Row width / Number of rows per plot	6.5 in. / 9 rows	Dates of flushing	May 16, 25, and June 9, 1999
Soil type	Dewitt silt loam (8% sand, 75% silt, 16% clay)	Date of flooding	June 21, 1999
% OM / pH	1 / 5.4		

Comments: PPI = preplant incorporated; PRE = preemergence; DPRE = delayed preemergence; EPOST = early postemergence; PREFL = pre flood. Rain (0.2 inch) fell 0.5 to 1 hour after EPOST application. Yield is adjusted to 12% moisture.

Application type	PPI	PRE	DPRE	EPOST	PREFL
Date applied	5/11/99	5/12/99	5/18/99	6/2/99	6/18/99
Time	11:30 am	8:00 am	7:30 pm	2:00 pm	7:00 am
Incorporation equipment	Triple-K	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	71 / 78	78 / 76	70 / 75	82 / 86	69 / 70
Relative humidity (%)	86	62	72	82	66
Wind (mph)	4	1	2	1	4
Weather	partly cloudy	mostly clear	clear	partly cloudy	partly cloudy
Soil moisture	dry	moist	moist	wet	moist
Crop stage/Height	N/A	N/A	N/A	2-3 lf / 6"	4-7 lf, 2 tiller / 10"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Turbo TJ / 110015	Turbo TJ / 110015	Teejet / XR11001 VS	Teejet / XR 11001 VS	Teejet / XR11001 VS
Boom ht / # Noz / Spacing (in.)	15 / 3 / 18	15 / 3 / 18	14 / 3 / 18	15 / 3 / 18	14 / 3 / 18
Gpa / Psi	10 / 22	10 / 21	10 / 41	10 / 42	10 / 42
Weed species (density)	----- [# leaves/height (in.)] -----				
R-ECHCG (24/row ft)	N/A	N/A	N/A	2-3 lf / 0.5-1"	4-8 lf, 2 tiller / 8-10"
ECHCG (29/ft ²)	N/A	N/A	N/A	2 lf / 0.5-0.75"	4-6 lf, 2 tiller / 6-8"
BRAPP (7/ft ²)	N/A	N/A	N/A	3 lf / 3.5"	5-9 lf, 3 tiller / 3-7"

Conclusions: Single applications of imazethapyr (0.063 to 0.125 lb/A) applied PRE or EPOST provided excellent season-long grass weed control. Similar results were seen with imazethapyr applied PPI except for the 0.063 lb/A rate of imazethapyr that lost control of grass throughout the season. Sequential applications of imazethapyr at 0.063 lb/A PPI or PRE followed by imazethapyr at 0.063 lb/A EPOST or PREFL gave excellent grass control, but injury tended to increase as the second application was made later in the season.

Table 25. Section 1.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass control					
			Resistant (RECHCG)			Susceptible (ECHCG)		
			6/18	6/29	7/28	6/18	6/29	7/28
Untreated check			0	0	0	0	0	0
Imazethapyr	0.063	PPI	83	79	71	83	78	71
Imazethapyr	0.094	PPI	95	90	98	94	91	98
Imazethapyr	0.125	PPI	93	93	95	93	93	94
Imazethapyr	0.063	PRE	86	85	89	86	86	89
Imazethapyr	0.094	PRE	91	93	94	90	95	93
Imazethapyr	0.125	PRE	93	98	100	93	98	99
Imazethapyr + AG-98 (0.25%)	0.063	EPOST	89	94	98	90	91	98
Imazethapyr + AG-98 (0.25%)	0.094	EPOST	91	97	100	91	97	100
Imazethapyr + AG-98 (0.25%)	0.125	EPOST	95	91	100	94	93	100
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI EPOST	96	92	98	95	95	100
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PRE EPOST	94	94	99	95	94	100
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI PREFL	90	95	99	86	90	99
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PRE PREFL	89	95	100	90	95	100
Pendimethalin + quinclorac <i>fb</i>	1.0 0.19	DPRE						
propanil	4.0	PREFL	99	97	100	99	97	100
Thiobencarb + propanil <i>fb</i>	3.0 3.0	EPOST						
thiobencarb + propanil	3.0 3.0	PREFL	30	28	16	75	94	94
LSD (0.05)			8	7	8	9	6	7

continued

Table 25. Section 2.

Herbicide	Rate (lb/A)	Application timing	Broadleaf signalgrass	Effect on rice			Yield 9/8 (lb/A)
			(BRAPP) control	Injury			
			6/18	6/18	6/29	7/28	
			-----	(%)	-----		
Untreated check			0	0	0	0	2013
Imazethapyr	0.063	PPI	93	0	0	0	3521
Imazethapyr	0.094	PPI	94	9	10	0	4040
Imazethapyr	0.125	PPI	93	11	19	15	4161
Imazethapyr	0.063	PRE	91	0	1	0	4326
Imazethapyr	0.094	PRE	93	0	6	0	4164
Imazethapyr	0.125	PRE	91	3	6	0	4362
Imazethapyr + AG-98 (0.25%)	0.063	EPOST	94	11	13	0	5026
Imazethapyr + AG-98 (0.25%)	0.094	EPOST	94	6	4	0	4979
Imazethapyr + AG-98 (0.25%)	0.125	EPOST	96	14	8	0	4766
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI EPOST	96	5	8	0	4940
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PRE EPOST	96	6	8	0	4485
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI PREFL	90	0	21	16	3824
Imazethapyr <i>fb</i> imazethapyr + AG-98 (0.25%)	0.063 0.063	PRE PREFL	94	0	28	26	4027
Pendimethalin + quinclorac <i>fb</i> propanil	1.0 0.19 4.0	 DPRE PREFL	99	1	21	16	4865
Thiobencarb + propanil <i>fb</i> thiobencarb + propanil	3.0 3.0 3.0 3.0	 EPOST PREFL	92	0	6	0	4645
LSD (0.05)			4	4	6	3	556

Table 26. Programs for hemp sesbania and northern jointvetch control in IMI-tolerant rice, Stuttgart, 1999.

TEST INFORMATION

Location	Stuttgart	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 8, 1999
Plot size	6 ft by 16 ft	Crop / Variety	Rice / IMI-Tolerant (Clearfield)
Row width / Number of rows per plot	6.5 in. / 9 rows	Dates of flushing	May 16, 25, and June 9, 1999
Soil type ... Dewitt silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 21, 1999
% OM / pH	1.0 / 5.4		

Comments: PPI = preplant incorporated; PREFL = pre flood. Yield is adjusted to 12% moisture.

Application type	PPI	PREFL
Date applied	5/11/99	6/18/99
Time	11:30 am	7:00 am
Incorporation equipment	Triple-K	N/A
Air/Soil temperature (F)	71 / 78	69 / 70
Relative humidity (%)	86	66
Wind (mph)	3	4
Weather	partly cloudy	partly cloudy
Soil moisture	dry	moist
Crop stage/Height	N/A	4-6 lf, 2 tiller / 10"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Turbo TJ / 110015	Teejet / XR11001 VS
Boom ht / # Noz / Spacing (in.)	14 / 3 / 18	14 / 3 / 18
Gpa / Psi	10 / 22	10 / 42
Weed species (density)	----- [# leaves/height (in.)] -----	
R-ECHCG (15/row ft)	N/A	4-7 lf, 2 tiller / 8-10"
ECHCG (28/ft ²)	N/A	4-6 lf, 2 tiller / 6-8"
BRAPP (4/ft ²)	N/A	6-9 lf, 3 tiller / 4-5"
IPOWR (4/row ft)	N/A	8-10 lf / 3-4"
IPOLA (20/row ft)	N/A	8-10 lf / 8-12"
SEBEX (25/row ft)	N/A	6-8 lf / 8-10"
AESVI (18/row ft)	N/A	4-6 lf / 4-5"

Conclusions: Imazethapyr has been shown in previous research to provide little activity on hemp sesbania and northern jointvetch. Our results from this study showed that PPI applications of imazethapyr could be followed by PREFL applications of imazethapyr + triclopyr or propanil to control hemp sesbania and northern jointvetch when used in a Clearfield rice system. The PPI application of imazethapyr followed by imazethapyr + acifluorfen controlled hemp sesbania but did not control northern jointvetch.

Table 26. Section 1.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass control					
			Resistant (R-ECHCG)			Susceptible (ECHCG)		
			6/29	7/7	7/28	6/29	7/7	7/28
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Imazethapyr <i>fb</i>	0.063	PPI						
imazethapyr +	0.063							
AG-98 (0.25%)		PREFL	98	100	100	98	100	98
Imazethapyr <i>fb</i>	0.063	PPI						
imazethapyr +	0.063							
acifluorfen +	0.2							
AG-98 (0.25%)		PREFL	98	100	100	98	100	100
Imazethapyr <i>fb</i>	0.063	PPI						
imazethapyr +	0.063							
triclopyr +	0.25							
AG-98 (0.25%)		PREFL	93	100	100	95	100	100
Imazethapyr <i>fb</i>	0.063	PPI						
imazethapyr +	0.063							
propanil +	3.0							
AG-98 (0.25%)		PREFL	98	100	99	98	100	98
LSD (0.05)			4	1	2	4	1	5

continued**Table 26. Section 2.**

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Pitted morningglory (IPOLA)			Palmleaf morningglory (IPOWER)		
			6/29	7/7	7/28	6/29	7/7	7/28
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Imazethapyr <i>fb</i>	0.063	PPI						
imazethapyr +	0.063							
AG-98 (0.25%)		PREFL	89	94	92	98	99	92
Imazethapyr <i>fb</i>	0.063	PPI						
imazethapyr +	0.063							
acifluorfen +	0.2							
AG-98 (0.25%)		PREFL	91	99	90	95	99	92
Imazethapyr <i>fb</i>	0.063	PPI						
imazethapyr +	0.063							
triclopyr +	0.25							
AG-98 (0.25%)		PREFL	90	95	98	96	100	98

continued

Table 26. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Pitted morningglory (IPOLA)			Palmleaf morningglory (IPOWER)		
			6/29	7/7	7/28	6/29	7/7	7/28
			----- (%) -----					
Imazethapyr <i>fb</i>	0.063	PPI						
imazethapyr +	0.063							
propanil +	3.0							
AG-98 (0.25%)		PREFL	80	93	89	97	99	88
LSD (0.05)			11	10	7	4	2	5

continued

Table 26. Section 3.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Hemp sesbania (SEBEX)			Northern jointvetch (AESVI)		
			6/29	7/7	7/28	6/29	7/7	7/28
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Imazethapyr <i>fb</i>	0.063	PPI						
imazethapyr +	0.063							
AG-98 (0.25%)		PREFL	0	0	6	0	40	63
Imazethapyr <i>fb</i>	0.063	PPI						
imazethapyr +	0.063							
acifluorfen +	0.2							
AG-98 (0.25%)		PREFL	97	91	92	26	51	66
Imazethapyr <i>fb</i>	0.063	PPI						
imazethapyr +	0.063							
triclopyr +	0.25							
AG-98 (0.25%)		PREFL	85	90	98	91	93	96
Imazethapyr <i>fb</i>	0.063	PPI						
imazethapyr +	0.063							
propanil +	3.0							
AG-98 (0.25%)		PREFL	97	100	95	87	83	91
LSD (0.05)			5	8	12	10	11	12

Table 26. Section 4.

Herbicide	Rate (lb/A)	Application timing	Effect on rice			Yield 9/8 (lb/A)
			Injury			
			6/29	7/7	7/28	
Untreated check			0	0	0	3090
Imazethapyr <i>fb</i>	0.063	PPI				
imazethapyr + AG-98 (0.25%)	0.063	PREFL	14	0	0	3019
Imazethapyr <i>fb</i>	0.063	PPI				
imazethapyr + acifluorfen + AG-98 (0.25%)	0.063 0.2	PREFL	11	0	0	4070
Imazethapyr <i>fb</i>	0.063	PPI				
imazethapyr + triclopyr + AG-98 (0.25%)	0.063 0.25	PREFL	4	0	0	4221
Imazethapyr <i>fb</i>	0.063	PPI				
imazethapyr + propanil + AG-98 (0.25%)	0.063 3.0	PREFL	24	1	0	3371
LSD (0.05)			6	NS	NS	693

Table 27. Comparison of clomazone and standard programs under non-flushed conditions, Stuttgart, 1999.

TEST INFORMATION

Location	Stuttgart	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest	September 15, 1999
Plot size	6 ft by 16 ft	Crop / Variety	Rice / Drew
Row width / Number of rows per plot	6.5 in. / 9 rows	Dates of flushing	June 10, 1999
Soil type	Dewitt silt loam (4% sand, 82% silt, 14% clay)	Date of flooding	June 21, 1999
% OM / pH	1 / 5.4		

Comments: PPI = preplant incorporated; PRE = preemergence; and DPRE =delayed preemergence. Yield is adjusted to 12% moisture.

Application type	PPI	PRE	DPRE
Date applied	5/11/99	5/12/99	5/18/99
Time	11:30 am	8:17 am	10:30 am
Incorporation equipment	Triple-K	N/A	N/A
Air/Soil temperature (F)	71 / 78	78 / 76	75 / 75
Relative humidity (%)	86	62	72
Wind (mph)	4	2	2
Weather	cloudy	mostly clear	clear
Soil moisture	normal	normal	normal
Crop stage/Height	N/A	N/A	spiking / 1"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Teejet / 110015 VP	Teejet / 110015 VP	Teejet / 110015 VS
Boom ht / # Noz / Spacing (in.)	14 / 3 / 18	14 / 3 / 18	14 / 3 / 18
Gpa / Psi	10 / 28	10 / 28	10 / 28

Conclusions: Clomazone provided season-long control (>90%) of both propanil-resistant and -susceptible barnyardgrass at 0.4 lb ai/A at a PRE or DPRE application timing. This level of control was comparable to or exceeded the current standards of quinclorac at 0.375 lb ai/A, thiobencarb at 4.0 lb ai/A, and pendimethalin at 1.0 lb ai/A all at a DPRE timing. Clomazone at 0.2 lb ai/A gave 90% control of both biotypes at a PRE or DPRE timing, however PPI applications failed to control both barnyardgrass biotypes season-long.

Table 27. Section 1.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass control										
			Susceptible (ECHCG)					Resistant (R-ECHCG)					
			6/3	6/9	6/17	6/29	7/13	6/3	6/9	6/17	6/29	7/13	
			----- (%) -----										
Untreated check			0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.2	PPI	98	90	87	91	79	100	78	81	82	68	
Clomazone	0.4	PPI	95	96	98	99	83	99	96	97	97	80	
Quinclorac	0.375	PPI	100	98	99	97	90	100	96	98	91	87	
Clomazone	0.2	PRE	96	98	97	97	89	100	94	96	96	80	
Clomazone	0.4	PRE	100	100	99	99	93	100	99	99	98	93	
Quinclorac	0.375	PRE	95	88	87	93	82	98	82	87	89	76	
Clomazone	0.2	DPRE	94	98	96	99	90	98	96	96	96	80	
Clomazone	0.4	DPRE	99	100	100	99	91	100	100	100	99	98	
Quinclorac	0.375	DPRE	91	99	98	96	93	96	97	95	91	88	
Pendimethalin	1.0	DPRE	98	96	99	92	88	100	99	96	89	84	
Thiobencarb	4.0	DPRE	99	99	89	90	73	100	98	90	84	75	
LSD (0.05)			6	11	11	9	17	4	20	15	18	17	

continued

Table 27. Section 2.

Herbicide	Rate (lb/A)	Application timing	Rice injury											
			Chlorosis						Biomass reduction					
			5/27	6/3	6/9	6/17	6/29	7/13	5/27	6/3	6/9	6/17	6/29	7/13
			----- (%) -----											
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.2	PPI	1	1	5	2	0	0	0	0	1	0	0	0
Clomazone	0.4	PPI	10	3	6	5	0	0	0	0	3	0	0	0
Quinclorac	0.375	PPI	0	0	0	0	0	0	0	0	1	1	0	0
Clomazone	0.2	PRE	2	3	2	0	0	0	0	0	1	0	0	0
Clomazone	0.4	PRE	6	3	3	1	0	0	0	0	2	0	0	0
Quinclorac	0.375	PRE	0	1	1	0	0	0	0	0	0	0	0	0
Clomazone	0.2	DPRE	0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.4	DPRE	0	0	3	2	0	0	0	0	2	0	0	0
Quinclorac	0.375	DPRE	0	0	0	0	0	0	0	0	0	0	0	0
Pendimethalin	1.0	DPRE	0	0	0	0	0	0	0	0	0	0	0	0
Thiobencarb	4.0	DPRE	0	0	0	0	0	0	0	0	0	0	0	0
LSD (0.05)			3	1	3	1	NS	NS	NS	NS	NS	NS	NS	NS

continued

Table 27. Section 3.

Herbicide	Rate (lb/A)	Application timing	Rice injury					Rice yield	
			5/27	6/3	6/9	6/17	6/29	7/13	6/3 (lb/A)
			----- (%) -----						
Untreated check			0	0	0	0	0	0	6075
Clomazone	0.2	PPI	0	0	1	0	0	0	8325
Clomazone	0.4	PPI	0	0	0	0	0	0	7425
Quinclorac	0.375	PPI	0	3	0	0	0	0	8415
Clomazone	0.2	PRE	0	0	0	0	0	0	7650
Clomazone	0.4	PRE	0	0	0	0	0	0	8550
Quinclorac	0.375	PRE	0	1	0	0	0	0	7965
Clomazone	0.2	DPRE	0	0	0	0	0	0	8640
Clomazone	0.4	DPRE	0	0	0	0	0	0	7245
Quinclorac	0.375	DPRE	0	0	0	0	0	0	8820
Pendimethalin	1.0	DPRE	0	0	0	0	0	0	9000
Thiobencarb	4.0	DPRE	0	0	0	0	0	0	8460
LSD (0.05)			NS	1	NS	NS	NS	NS	NS

Table 28. Evaluation of clomazone (Command) and imazethapyr (Pursuit) for aquatic control, Stuttgart, 1999.**TEST INFORMATION**

Location	Stuttgart	Planting date	N/A
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	6 ft by 16 ft	Crop / Variety	NA / N/A
Row width / Number of rows per plot	6.5 in. / 9 rows	Dates of flushing	May 16, 25, and June 10, 1999
Soil type	Dewitt silt loam (4% sand, 82% silt, 14% clay)	Date of flooding	June 21, 1999
% OM / pH	1 / 5.5		

Comments: This trial was evaluated on bare ground, i.e. no rice planted. This is to insure good aquatic pressure. PPI = preplant incorporated; PRE = preemergence; EPOST = early postemergence; and PREFL = pre flood.

Application type	PPI	PRE	EPOST	PREFL
Date applied	5/11/99	5/12/99	6/2/99	6/18/99
Time	11:30 am	8:17 pm	1:00 pm	8:30 am
Incorporation equipment	Triple-K	N/A	N/A	N/A
Air/Soil temperature (F)	71 / 78	78 / 76	82 / 86	69 / 70
Relative humidity (%)	86	62	82	66
Wind (mph)	4	2	2	4
Weather	cloudy	mostly clear	partly cloudy	clear
Soil moisture	normal	normal	moist	moist
Crop stage/Height	N/A	N/A	N/A	N/A
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Teejet / 110015 VP	Teejet / 110015 VP	Teejet / 11001 VS	Teejet / 11001 VS
Boom ht / # Noz / Spacing (in.)	14 / 3 / 16	14 / 3 / 16	14 / 3 / 16	14 / 3 / 16
Gpa / Psi	10 / 28	10 / 28	10 / 40	10 / 40

Conclusions: Clomazone was shown to have little activity on duck salad, with activity limited to programs of imazethapyr.

Table 28.

Herbicide	Rate (lb/A)	Application timing	Ducksalad (HELT) control			
			7/13	7/30	8/11	8/17
			----- (%) -----			
Untreated check			0	0	0	0
Clomazone	0.3	PRE	10	0	0	0
Clomazone	0.5	PRE	8	0	0	0
Clomazone <i>fb</i>	0.5	PRE				
bensulfuron + Agri-Dex (1.0%)	0.06	PREFL	94	36	23	0
Clomazone <i>fb</i>	0.3	PRE				
propanil	3.0	PREFL	10	0	0	0
Imazethapyr	0.094	PPI	18	58	45	40
Imazethapyr <i>fb</i>	0.063	PPI				
imazethapyr + AG-98 (0.25%)	0.063	EPOST	41	93	73	50
Imazethapyr <i>fb</i>	0.063	PPI				
imazethapyr + AG-98 (0.25%)	0.063	PREFL	15	86	74	53
Imazethapyr <i>fb</i>	0.063	EPOST				
imazethapyr + AG-98 (0.25%)	0.063	PREFL	20	86	68	43
Quinclorac <i>fb</i>	0.375	PRE				
bensulfuron + Agri-Dex (1.0%)	0.06	PREFL	90	31	15	0
Quinclorac <i>fb</i>	0.375	PRE				
halosulfuron + AG-98 (0.25%)	0.047	PREFL	18	3	0	0
LSD (0.05)			19	20	16	9

Table 29. Herbicide evaluation of clomazone in herbicide programs in Arkansas rice, Stuttgart, 1999.**TEST INFORMATION**

Location	Stuttgart	Planting date	May 12, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 16, 1999
Plot size	6 ft by 16 ft	Crop / Variety	Rice / Drew
Row width / Number of rows per plot	6.5 in. / 9 rows	Dates of flushing	May 16, 25, and June 10, 1999
Soil type ... Dewitt silt loam (4% sand, 81% silt, 15% clay)		Date of flooding	June 21, 1999
% OM / pH	1.0 / 6.0		

Comments: PRE = preemergence; DPRE = delayed preemergence; EPOST = early postemergence; and PREFL = pre-flood. Yield is adjusted to 12% moisture.

Application type	PRE	DPRE	EPOST	PREFL
Date applied	5/12/99	5/18/99	6/2/99	6/18/99
Time	8:17 pm	10:30 am	1:00 pm	8:30 am
Incorporation equipment	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	78 / 76	75 / 75	82 / 86	69 / 70
Relative humidity (%)	62	72	82	66
Wind (mph)	2	2	3	4
Weather	mostly clear	clear	partly cloudy	clear
Soil moisture	normal	normal	moist	moist
Crop stage/Height	N/A	/ 1"	3 lf / 6"	5-7 lf / 10"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Teejet / 110015 VP	Teejet / 110015 VP	Teejet / 11001 VS	Teejet / 11001 VS
Boom ht / # Noz / Spacing (in.)	14 / 3 / 18	14 / 3 / 18	14 / 3 / 18	14 / 3 / 18
Gpa / Psi	10 / 28	10 / 28	10 / 42	10 / 42
Weed species (density)	----- [# leaves/height (in.)] -----			
S-ECHCG (20/row ft)	N/A	N/A	2 lf / 1"	2-3 lf / 4-5"
R-ECHCG (25/row ft)	N/A	N/A	2-3 lf / 1.5"	4-6 lf, 1 tiller / 4-6"
AESVI (13/row ft)	N/A	N/A	2-3 lf / 0.75"	4-5 lf / 2-3"
IPOWR (4/row ft)	N/A	N/A	3 lf / 2-3"	5-7 lf / 4-5"
IPOLA (5-6/row ft)	N/A	N/A	4-5 lf / 3-4"	8-10 lf / 4-6"
SEBEX (20/row ft)	N/A	N/A	3-4 lf / 4-5"	5-6 lf / 8-10"
BRAPP (1/sw ft)	N/A	N/A	3-6 lf / 4"	10-12 lf / 5-6"
DIGSA (20/row ft)	N/A	N/A	N/A	1-2 lf / 1-2"

Conclusions: Clomazone at 0.2 and 0.4 lb ai/A gave >90% control of both propanil-resistant and susceptible barnyardgrass and >85% control of broadleaf signalgrass prior to sequential applications. Programs of quinclorac, carfentrazone, and bensulfuron gave control of palmleaf morningglory. Programs with quinclorac at 0.375 lb ai/A and propanil PREFL gave exceptional control of northern jointvetch. Hemp sesbania control was also limited to these same herbicides with the addition of carfentrazone.

Table 29. Section 1.

Herbicide	Application		Barnyardgrass control										
	Rate (lb/A)	timing	Resistant (R-ECHCG)						Susceptible (ECHCG)				
			6/3	6/9	6/17	6/23	6/29	7/13	6/3	6/9	6/17	6/23	6/29
----- (%) -----													
Untreated check			0	0	0		0	0	0	0	0	0	0
Clomazone	0.2	PRE	97	100	94		99	95	97	100	94	99	96
Clomazone	0.5	PRE	93	100	99		100	98	93	100	98	100	99
Clomazone	0.2	DPRE	91	100	99		100	100	96	100	100	100	100
Clomazone	0.5	DPRE	95	100	99		100	100	91	100	100	100	100
Clomazone + quinclorac	0.375	PRE	100	100	100		100	100	100	100	100	100	100
Clomazone + quinclorac	0.19	PRE	94	100	95		100	100	94	98	95	100	100
Clomazone + quinclorac	0.375	DPRE	100	100	100		100	100	100	100	100	100	100
Clomazone + thiobencarb	4.0	DPRE	95	100	99		100	100	95	100	100	100	100
Clomazone + thiobencarb	2.0	DPRE	94	100	100		100	100	93	100	100	100	100
Clomazone + pendimethalin	1.0	DPRE	99	100	100		100	100	99	100	100	100	100
Clomazone + quinclorac	0.19	DPRE	100	100	99		100	100	99	100	99	100	100
Clomazone <i>fb</i> carfentrazone + AG-98 (0.25%)	0.02	PRE PREFL	90	100	100		100	100	90	100	100	100	100
Clomazone <i>fb</i> propanil	3.0	PREFL	91	100	100		100	100	90	100	100	100	100
Clomazone <i>fb</i> propanil	3.0	PREFL	90	83	91		100	95	89	95	93	100	98
Clomazone <i>fb</i> bensulfuron + Agri-Dex (1.0%)	0.06	PREFL	88	89	66		96	96	86	90	83	100	97
Clomazone <i>fb</i> (propanil + molinate) + bensulfuron	4.5	PREFL	91	93	87		100	100	90	94	85	100	100
Clomazone <i>fb</i> carfentrazone + AG-98 (0.25%)	0.02	PREFL	93	100	100		100	100	88	100	100	100	100
Clomazone <i>fb</i> propanil	3.0	PREFL	93	100	100		100	100	91	100	100	100	100

continued

Table 29. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass control											
			Resistant (R-ECHCG)						Susceptible (ECHCG)					
			6/3	6/9	6/17	6/23	6/29	7/13	6/3	6/9	6/17	6/23	6/29	7/13
			----- (%) -----											
Quinclorac <i>fb</i>	0.38	DPRE												
propanil	3.0	PREFL	100	100	100		100	100	100	100	100		100	100
Clomazone <i>fb</i>	0.5	PRE												
carfentrazone + AG-98 (0.25%) <i>fb</i>	0.02	EPOST												
carfentrazone + AG-98 (0.25%)	0.02	PREFL	100	100	100	100	100	100	100	100	100		100	100
Clomazone <i>fb</i>	0.5	PRE												
carfentrazone + AG-98 (0.25%)	0.02	EPOST	98	100	100	100	100	100	98	100	100	100	100	100
Clomazone <i>fb</i>	0.5	PRE												
carfentrazone + bentazon + AG-98 (0.25%)	0.02 0.75	EPOST	96	100	100	100	100	100	98	100	100	100	100	100
Clomazone <i>fb</i>	0.5	PRE												
carfentrazone + (acifluorfen + bentazon) + AG-98 (0.25%)	0.02 0.25	EPOST	99	98	100	100	99	100	98	100	100	100	99	100
Clomazone <i>fb</i>	0.5	PRE												
carfentrazone + acifluorfen + AG-98 (0.25%)	0.02 0.125	EPOST	100	100	100	100	99	99	100	100	100	100	100	100
Carfentrazone + propanil	0.02 3.0	EPOST		28	24	8	25	25		70	75	65	69	66
Carfentrazone + propanil + thiobencarb	0.02 3.0 4.0	EPOST		100	99	98	100	100		100	100	100	100	99
Carfentrazone + propanil + pendimethalin	0.02 3.0 1.0	EPOST		93	100	98	100	100		100	100	100	99	99
Carfentrazone + (propanil + molinate)	0.02 4.5	EPOST		96	74	75	96	96		98	100	75	99	96
Carfentrazone + quinclorac + AG-98 (0.25%)	0.02 0.38	EPOST		100	100	100	100	100		100	100	100	100	100
Carfentrazone + fenoxaprop	0.02 0.067	EPOST		100	95	99	100	100		100	99	100	99	100

continued

Table 29. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass control												
			Resistant (R-ECHCG)						Susceptible (ECHCG)						
			6/3	6/9	6/17	6/23	6/29	7/13	6/3	6/9	6/17	6/23	6/29	7/13	
			----- (%) -----												
Quinclorac <i>fb</i>	0.38	DPRE													
propanil	3.0	PREFL	100	100	100		100	100	100	100	100		100	100	
Clomazone <i>fb</i>	0.5	PRE													
carfentrazone + AG-98 (0.25%) <i>fb</i>	0.02	EPOST													
carfentrazone + AG-98 (0.25%)	0.02	PREFL	100	100	100	100	100	100	100	100	100		100	100	
Carfentrazone + bispyribac-sodium + Kinetic (0.125%)	0.02 0.019	EPOST		100	96	100	98	99		100	91	100	98	100	
Carfentrazone + halosulfuron + AG-98 (0.25%)	0.02 0.047	EPOST		36	41	3	33	34		20	31	0	35	31	
Carfentrazone + bensulfuron + AG-98 (0.25%)	0.02 0.063	EPOST	0	0	8	23	43	31		0	13	24	48	41	
Quinclorac <i>fb</i>	0.38	DPRE													
propanil + triclopyr	3.0 0.19	EPOST	100	100	100	100	100	100	100	100	100	100	100	100	
LSD (0.05)			6	11	17	11	4	11		5	10	13	25	9	11

continued

Table 29. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control											
			Broadleaf signalgrass (BRAPP)						Palmleaf morningglory (IPOWR)					
			6/3	6/9	6/17	6/23	6/29	7/13	6/3	6/9	6/17	6/23	6/29	7/13
			----- (%) -----											
Untreated check			0	0	0		0	0	0	0	0		0	0
Clomazone	0.2	PRE	100	100	89		98	99	40	20	35		15	8
Clomazone	0.5	PRE	100	99	98		100	97	68	70	35		28	35
Clomazone	0.2	DPRE	100	98	100		100	100	51	35	65		53	26
Clomazone	0.5	DPRE	100	100	100		100	100	48	73	59		49	31
Clomazone + quinclorac	0.5 0.375	PRE	100	100	100		100	100	100	100	100		100	100
Clomazone + quinclorac	0.2 0.19	PRE	100	100	100		100	100	100	88	100		100	100

continued

Table 29. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control											
			Broadleaf signalgrass (BRAPP)						Palmleaf morningglory (IPOWER)					
			6/3	6/9	6/17	6/23	6/29	7/13	6/3	6/9	6/17	6/23	6/29	7/13
			----- (%) -----											
Clomazone + quinclorac	0.5 0.375	DPRE	100	100	100		100	100	78	93	100		100	100
Clomazone + thiobencarb	0.5 4.0	DPRE	100	100	100		100	100	68	71	63		81	51
Clomazone + thiobencarb	0.2 2.0	DPRE	99	100	100		100	100	70	54	45		69	70
Clomazone + pendimethalin	0.2 1.0	DPRE	100	100	100		100	100	41	34	34		15	23
Clomazone + quinclorac	0.2 0.19	DPRE	100	100	100		100	100	53	61	80		96	91
Clomazone <i>fb</i> carfentrazone + AG-98 (0.25%)	0.5 0.02	PRE PREFL	100	100	100		100	100	75	78	79		100	99
Clomazone <i>fb</i> propanil	0.5 3.0	PRE PREFL	100	100	100		100	100	49	48	33		83	66
Clomazone <i>fb</i> propanil	0.2 3.0	PRE PREFL	98	100	98		100	100	81	73	68		100	71
Clomazone <i>fb</i> bensulfuron + Agri-Dex (1.0%)	0.2 0.06	PRE PREFL	98	96	90		100	99	19	35	25		55	80
Clomazone <i>fb</i> (propanil + molinat) + bensulfuron	0.2 4.5 0.06	PRE PREFL	100	84	86		100	100	21	20	28		100	100
Clomazone <i>fb</i> carfentrazone + AG-98 (0.25%)	0.5 0.02	DPRE PREFL	100	100	100		100	100	46	45	60		100	100
Clomazone <i>fb</i> propanil	0.5 3.0	DPRE PREFL	100	100	100		100	100	63	61	48		91	76
Quinclorac <i>fb</i> propanil	0.38 3.0	DPRE PREFL	100	100	98		100	100	95	100	100		100	100
Clomazone <i>fb</i> carfentrazone + AG-98 (0.25%) <i>fb</i>	0.5 0.02	PRE EPOST												
Clomazone <i>fb</i> carfentrazone + AG-98 (0.25%)	0.5 0.02	PRE PREFL	100	100	100	100	100	100	96	100	100	100	100	100
Clomazone <i>fb</i> carfentrazone + AG-98 (0.25%)	0.5 0.02	PRE EPOST	100	100	100	100	100	100	98	100	100	100	100	100

continued

Table 29. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control											
			Broadleaf signalgrass (BRAPP)						Palmleaf morningglory (IPOWER)					
			6/3	6/9	6/17	6/23	6/29	7/13	6/3	6/9	6/17	6/23	6/29	7/13
			----- (%) -----											
Clomazone <i>fb</i> carfentrazone + bentazon + AG-98 (0.25%)	0.5 0.02 0.75	PRE EPOST	100	100	100	100	100	100	96	100	100	100	100	98
Clomazone <i>fb</i> carfentrazone + (acifluorfen + bentazon) + AG-98 (0.25%)	0.5 0.02 0.25	PRE EPOST	100	100	100	100	99	100	99	100	100	100	100	100
Clomazone <i>fb</i> carfentrazone + acifluorfen + AG-98 (0.25%)	0.5 0.02 0.125	PRE EPOST	100	100	100	100	100	99	100	100	100	100	100	100
Carfentrazone + propanil	0.02 3.0	EPOST		98	87	96	85	100		100	100	100	100	99
Carfentrazone + propanil + thiobencarb	0.02 3.0 4.0	EPOST		100	100	100	100	100		100	100	100	100	100
Carfentrazone + propanil + pendimethalin	0.02 3.0 1.0	EPOST		100	100	100	100	99		100	100	100	100	100
Carfentrazone + (propanil + molinate)	0.02 4.5	EPOST		100	100	100	100	100		100	100	100	100	100
Carfentrazone + quinclorac + AG-98 (0.25%)	0.02 0.38	EPOST		100	100	100	100	100		100	100	100	100	100
Carfentrazone + fenoxaprop	0.02 0.067	EPOST		100	100	100	100	100		100	100	100	100	100
Carfentrazone + bispyribac-sodium + Kinetic (0.125%)	0.02 0.019	EPOST		94	61	44	49	55		100	100	100	100	100
Carfentrazone + halosulfuron + AG-98 (0.25%)	0.02 0.047	EPOST		40	10	10	29	46		100	100	100	100	100
Carfentrazone + bensulfuron + AG-98 (0.25%)	0.02 0.063	EPOST		0	0	0	20	45		100	99	100	100	99

continued

Table 29. Section 2. Continued.

Herbicide	Application		Weed control												
			Broadleaf signalgrass (BRAPP)						Palmleaf morningglory (IPOWER)						
			6/3	6/9	6/17	6/23	6/29	7/13	6/3	6/9	6/17	6/23	6/29	7/13	
	Rate	timing	----- (%) -----												
	(lb/A)														
Quinclorac <i>fb</i>	0.38	DPRE													
propanil +	3.0														
triclopyr	0.19	EPOST		100	100	100	100	100		84	100	100	100	100	
LSD (0.05)			1	12	8	13	10	12		28	31	34	NS	26	21

continued

Table 29. Section 3.

Herbicide	Application		Weed control											
			Northern jointvetch (AESVI)						Hemp sesbania (SEBEX)					
			6/3	6/9	6/17	6/23	6/29	7/13	6/3	6/9	6/17	6/23	6/29	7/13
	Rate	timing	----- (%) -----											
	(lb/A)													
Untreated check			0	0	0		0	0	0	0	0		0	0
Clomazone	0.2	PRE	18	13	0		8	8	0	3	0		8	3
Clomazone	0.5	PRE	43	31	25		25	26	21	15	10		10	8
Clomazone	0.2	DPRE	43	20	10		8	15	0	10	10		8	5
Clomazone	0.5	DPRE	50	45	46		30	15	10	18	10		8	8
Clomazone +	0.5													
quinclorac	0.375	PRE	55	83	100		99	100	88	100	100		100	100
Clomazone +	0.2													
quinclorac	0.19	PRE	56	60	78		66	60	73	74	70		71	70
Clomazone +	0.5													
quinclorac	0.375	DPRE	59	85	89		91	98	45	84	95		97	90
Clomazone +	0.5													
thiobencarb	4.0	DPRE	58	61	61		76	63	39	36	15		10	5
Clomazone +	0.2													
thiobencarb	2.0	DPRE	46	13	15		15	15	10	15	5		5	5
Clomazone +	0.2													
pendimethalin	1.0	DPRE	23	8	0		8	10	0	23	0		8	5
Clomazone +	0.2													
quinclorac	0.19	DPRE	50	56	39		38	38	61	66	75		60	64
Clomazone <i>fb</i>	0.5													
carfentrazone +	0.02	PRE												
AG-98 (0.25%)		PREFL	48	48	58		96	85	8	33	3		99	100
Clomazone <i>fb</i>	0.5	PRE												
propanil	3.0	PREFL	46	35	19		99	99	0	23	8		100	100

continued

Table 29. Section 3. Continued

Herbicide	Rate (lb/A)	Application timing	Weed control											
			Northern jointvetch (AESVI)						Hemp sesbania (SEBEX)					
			6/3	6/9	6/17	6/23	6/29	7/13	6/3	6/9	6/17	6/23	6/29	7/13
			----- (%) -----											
Clomazone <i>fb</i>	0.2	PRE												
propanil	3.0	PREFL	20	10	15		100	95	0	20	14		100	100
Clomazone <i>fb</i>	0.2	PRE												
bensulfuron + Agri-Dex (1.0%)	0.06	PREFL	15	10	0		25	35	0	10	3		39	68
Clomazone <i>fb</i>	0.2	PRE												
(propanil + mollinate) + bensulfuron	4.5 0.06	PREFL	28	5	0		100	95	0	3	3		100	100
Clomazone <i>fb</i>	0.5	DPRE												
carfentrazone + AG-98 (0.25%)	0.02	PREFL	50	56	49		99	98	0	8	3		100	99
Clomazone <i>fb</i>	0.5	DPRE												
propanil	3.0	PREFL	48	66	46		100	99	0	8	3		100	100
Quinclorac <i>fb</i>	0.38	DPRE												
propanil	3.0	PREFL	58	90	95		100	100	71	91	100		100	100
Clomazone <i>fb</i>	0.5	PRE												
carfentrazone + AG-98 (0.25%) <i>fb</i>	0.02	EPOST												
carfentrazone + AG-98 (0.25%)	0.02	PREFL	61	86	93	100	100	98	53	99	100	100	100	100
Clomazone <i>fb</i>	0.5	PRE												
carfentrazone + AG-98 (0.25%)	0.02	EPOST	66	93	89	96	69	85	70	98	99	96	76	89
Clomazone <i>fb</i>	0.5	PRE												
carfentrazone + bentazon + AG-98 (0.25%)	0.02 0.75	EPOST	60	88	83	94	64	60	68	100	100	96	94	100
Clomazone <i>fb</i>	0.5	PRE												
carfentrazone + (acifluorfen + bentazon) + AG-98 (0.25%)	0.02 0.25	EPOST	64	75	74	88	75	55	69	100	98	100	88	89
Clomazone <i>fb</i>	0.5	PRE												
carfentrazone + acifluorfen + AG-98 (0.25%)	0.02 0.125	EPOST	63	96	85	98	79	69	73	100	100	100	100	70
Carfentrazone + propanil	0.02 3.0	EPOST		95	74	100	83	69		100	100	100	98	96

continued

Table 29. Section 3. Continued

Herbicide	Rate (lb/A)	Application timing	Weed control											
			Northern jointvetch (AESVI)						Hemp sesbania (SEBEX)					
			6/3	6/9	6/17	6/23	6/29	7/13	6/3	6/9	6/17	6/23	6/29	7/13
			----- (%) -----											
Carfentrazone + propanil + thiobencarb	0.02 3.0 4.0	EPOST	100	100	100	99	88	100	100	100	100	100	100	
Carfentrazone + propanil + pendimethalin	0.02 3.0 1.0	EPOST	85	84	98	89	78	100	100	100	96	76		
Carfentrazone + (propanil + molinate)	0.02 4.5	EPOST	95	65	100	88	77	100	100	100	99	88		
Carfentrazone + quinclorac + AG-98 (0.25%)	0.02 0.38	EPOST	99	100	100	100	100	100	100	100	100	100	100	
Carfentrazone + fenoxaprop	0.02 0.067	EPOST	85	51	50	33	29	96	100	100	99	90		
Carfentrazone + bispyribac-sodium + Kinetic (0.125%)	0.02 0.019	EPOST	79	68	95	88	80	96	99	100	100	100		
Carfentrazone + halosulfuron + AG-98 (0.25%)	0.02 0.047	EPOST	88	98	100	98	96	96	96	98	98	91		
Carfentrazone + bensulfuron + AG-98 (0.25%)	0.02 0.063	EPOST	88	91	100	95	80	98	96	100	95	100		
Quinclorac <i>fb</i> propanil + triclopyr	0.38 3.0 0.19	DPRE EPOST	59	100	100	100	100	100	79	100	100	100	100	
LSD (0.05)			17	21	25	10	20	30	22	19	15	3	14	22

continued

Table 29. Section 4.

Herbicide	Rate (lb/A)	Application timing	Pitted morningglory (IPOLA) control					
			6/3	6/9	6/17	6/23	6/29	7/13
			----- (%) -----					
Untreated check			0	0	0		0	0
Clomazone	0.2	PRE	5	0	0		10	0
Clomazone	0.5	PRE	30	5	0		5	10
Clomazone	0.2	DPRE	15	5	0		15	5
Clomazone	0.5	DPRE	25	15	5		10	40
Clomazone + quinclorac	0.5 0.375	PRE	88	100	100		100	100
Clomazone + quinclorac	0.2 0.19	PRE	90	88	100		100	100
Clomazone + quinclorac	0.5 0.375	DPRE	78	85	93		93	100
Clomazone + thiobencarb	0.5 4.0	DPRE	75	80	50		60	60
Clomazone + thiobencarb	0.2 2.0	DPRE	15	15	0		10	5
Clomazone + pendimethalin	0.2 1.0	DPRE	10	20	10		10	15
Clomazone + quinclorac	0.2 0.19	DPRE	30	45	53		40	64
Clomazone <i>fb</i> carfentrazone + AG-98 (0.25%)	0.5 0.02	PRE PREFL	25	5	0		92	70
Clomazone <i>fb</i> propanil	0.5 3.0	PRE PREFL	35	0	0		40	35
Clomazone <i>fb</i> propanil	0.2 3.0	PRE PREFL	0	0	0		45	30
Clomazone <i>fb</i> bensulfuron + Agri-Dex (1.0%)	0.2 0.06	PRE PREFL	10	0	0		25	100
Clomazone <i>fb</i> (propanil + molinate) + bensulfuron	0.2 4.5 0.06	PRE PREFL	10	0	0		78	100
Clomazone <i>fb</i> carfentrazone + AG-98 (0.25%)	0.5 0.02	DPRE PREFL	15	0	15		95	98
Clomazone <i>fb</i> propanil	0.5 3.0	DPRE PREFL	0	10	35		53	45
Quinclorac <i>fb</i> propanil	0.38 3.0	DPRE PREFL	58	68	83		98	100

continued

Table 29. Section 4. Continued.

Herbicide	Rate (lb/A)	Application timing	Pitted morningglory (IPOLA) control					
			6/3	6/9	6/17	6/23	6/29	7/13
			----- (%) -----					
Clomazone <i>fb</i>	0.5	PRE						
carfentrazone + AG-98 (0.25%) <i>fb</i>	0.02	EPOST						
carfentrazone + AG-98 (0.25%)	0.02	PREFL	100	99	98		100	100
Clomazone <i>fb</i>	0.5	PRE						
carfentrazone + AG-98 (0.25%)	0.02	EPOST	85	100	93		100	100
Clomazone <i>fb</i>	0.5	PRE						
carfentrazone + bentazon + AG-98 (0.25%)	0.02 0.75	EPOST	95	100	100		100	95
Clomazone <i>fb</i>	0.5	PRE						
carfentrazone + (acifluorfen + bentazon) + AG-98 (0.25%)	0.02 0.25	EPOST	98	100	100		100	100
Clomazone <i>fb</i>	0.5	PRE						
carfentrazone + acifluorfen + AG-98 (0.25%)	0.02 0.125	EPOST	93	100	98		100	95
Carfentrazone + propanil	0.02 3.0	EPOST	0	100	100		100	98
Carfentrazone + propanil + thiobencarb	0.02 3.0 4.0	EPOST	0	100	100		100	100
Carfentrazone + propanil + pendimethalin	0.02 3.0 1.0	EPOST	0	100	100		100	100
Carfentrazone + (propanil + molinat)	0.02 4.5	EPOST	0	100	93		100	100
Carfentrazone + quinclorac + AG-98 (0.25%)	0.02 0.38	EPOST	0	95	97		100	100
Carfentrazone + fenoxaprop	0.02 0.067	EPOST	0	93	90		100	100
Carfentrazone + bispyribac-sodium + Kinetic (0.125%)	0.02 0.019	EPOST	0	95	93		100	100

continued

Table 29. Section 4. Continued.

Herbicide	Rate (lb/A)	Application timing	Pitted morningglory (IPOLA) control					
			6/3	6/9	6/17	6/23	6/29	7/13
			----- (%) -----					
Carfentrazone + halosulfuron + AG-98 (0.25%)	0.02 0.047	EPOST	0	80	95		100	100
Carfentrazone + bensulfuron + AG-98 (0.25%)	0.02 0.063	EPOST	0	93	95		100	100
Quinclorac <i>fb</i> propanil + triclopyr	0.38 3.0 0.19	DPRE EPOST						
			68	100	100		100	100
LSD (0.05)			28	20	33		25	35

continued

Table 29. Section 5.

Herbicide	Rate (lb/A)	Application timing	Rice chlorosis						
			5/26	6/3	6/9	6/17	6/23	6/29	7/13
			----- (%) -----						
Untreated check			0	0	0	0		0	0
Clomazone	0.2	PRE	6	0	0	0		0	0
Clomazone	0.5	PRE	16	16	10	1		0	0
Clomazone	0.2	DPRE	3	0	0	0		0	0
Clomazone	0.5	DPRE	4	11	10	1		0	0
Clomazone + quinclorac	0.5 0.375	PRE	19	6	3	0		0	0
Clomazone + quinclorac	0.2 0.19	PRE	23	10	5	0		0	0
Clomazone + quinclorac	0.5 0.375	DPRE	3	4	1	0		0	0
Clomazone + thiobencarb	0.5 4.0	DPRE	6	18	14	3		0	0
Clomazone + thiobencarb	0.2 2.0	DPRE	1	1	0	0		0	0
Clomazone + pendimethalin	0.2 1.0	DPRE	1	0	0	0		0	0
Clomazone + quinclorac	0.2 0.19	DPRE	1	0	0	0		0	0

continued

Table 29. Section 5. Continued.

Herbicide	Rate (lb/A)	Application timing	Rice chlorosis						
			5/26	6/3	6/9	6/17	6/23	6/29	7/13
			----- (%) -----						
Clomazone <i>fb</i>	0.5								
carfentrazone + AG-98 (0.25%)	0.02	PRE							
		PREFL	4	10	10	1		0	0
Clomazone <i>fb</i>	0.5	PRE							
propanil	3.0	PREFL	16	14	10	1		0	0
Clomazone <i>fb</i>	0.2	PRE							
propanil	3.0	PREFL	5	1	0	0		0	0
Clomazone <i>fb</i>	0.2	PRE							
bensulfuron + Agri-Dex (1.0%)	0.06	PREFL	5	0	0	0		0	0
Clomazone <i>fb</i>	0.2	PRE							
(propanil + mollinate) + bensulfuron	4.5 0.06	PREFL	6	1	1	0		0	0
Clomazone <i>fb</i>	0.5	DPRE							
carfentrazone + AG-98 (0.25%)	0.02	PREFL	3	10	6	0		0	0
Clomazone <i>fb</i>	0.5	DPRE							
propanil	3.0	PREFL	5	8	4	2		0	0
Quinclorac <i>fb</i>	0.38	DPRE							
propanil	3.0	PREFL	0	0	0	0		0	0
Clomazone <i>fb</i>	0.5	PRE							
carfentrazone + AG-98 (0.25%) <i>fb</i>	0.02	EPOST							
carfentrazone + AG-98 (0.25%)	0.02	PREFL	24	19	5	2	0	0	0
Clomazone <i>fb</i>	0.5	PRE							
carfentrazone + AG-98 (0.25%)	0.02	EPOST	18	15	4	1	0	0	0
Clomazone <i>fb</i>	0.5	PRE							
carfentrazone + bentazon + AG-98 (0.25%)	0.02 0.75	EPOST	20	19	8	0	1	0	0
Clomazone <i>fb</i>	0.5	PRE							
carfentrazone + (acifluorfen + bentazon) + AG-98 (0.25%)	0.02 0.25	EPOST	23	25	9	1	0	0	0

continued

Table 29. Section 5. Continued.

Herbicide	Rate (lb/A)	Application timing	Rice chlorosis						
			5/26	6/3	6/9	6/17	6/23	6/29	7/13
			----- (%) -----						
Clomazone <i>fb</i>	0.5	PRE							
carfentrazone + acifluorfen + AG-98 (0.25%)	0.02 0.125	EPOST	23	21	4	0	0	0	0
Carfentrazone + propanil	0.02 3.0	EPOST	0		0	0	0	0	0
Carfentrazone + propanil + thiobencarb	0.02 3.0 4.0	EPOST	0		0	0	0	0	0
Carfentrazone + propanil + pendimethalin	0.02 3.0 1.0	EPOST	0		0	0	0	0	0
Carfentrazone + (propanil + molinate)	0.02 4.5	EPOST	0		0	0	0	0	0
Carfentrazone + quinclorac + AG-98 (0.25%)	0.02 0.38	EPOST	0		0	0	0	0	0
Carfentrazone + fenoxaprop	0.02 0.067	EPOST	0		0	0	0	0	0
Carfentrazone + bispyribac-sodium + Kinetic (0.125%)	0.02 0.019	EPOST	0		0	0	0	0	0
Carfentrazone + halosulfuron + AG-98 (0.25%)	0.02 0.047	EPOST	0		0	0	0	0	0
Carfentrazone + bensulfuron + AG-98 (0.25%)	0.02 0.063	EPOST	0		0	0	0	0	0
Quinclorac <i>fb</i>	0.38	DPRE							
propanil + triclopyr	3.0 0.19	EPOST	0	0	0	0	0	0	0
LSD (0.05)			7	8	5	1	NS	NS	NS

continued

Table 29. Section 6.

Herbicide	Rate (lb/A)	Application timing	Rice biomass reduction					
			6/3	6/9	6/17	6/23	6/29	7/13
			----- (%) -----					
Untreated check			0	0	0		0	0
Clomazone	0.2	PRE	0	0	0		0	0
Clomazone	0.5	PRE	0	0	0		0	0
Clomazone	0.2	DPRE	0	0	0		0	0
Clomazone	0.5	DPRE	0	0	0		0	0
Clomazone + quinclorac	0.5 0.375	PRE	0	0	0		0	0
Clomazone + quinclorac	0.2 0.19	PRE	0	0	0		0	0
Clomazone + quinclorac	0.5 0.375	DPRE	0	0	0		3	0
Clomazone + thiobencarb	0.5 4.0	DPRE	0	0	0		0	0
Clomazone + thiobencarb	0.2 2.0	DPRE	0	0	0		0	0
Clomazone + pendimethalin	0.2 1.0	DPRE	0	0	0		0	0
Clomazone + quinclorac	0.2 0.19	DPRE	0	0	0		0	0
Clomazone <i>fb</i> carfentrazone + AG-98 (0.25%)	0.5 0.02	PRE PREFL	0	0	0		0	0
Clomazone <i>fb</i> propanil	0.5 3.0	PRE PREFL	0	0	0		0	0
Clomazone <i>fb</i> propanil	0.2 3.0	PRE PREFL	0	0	0		0	0
Clomazone <i>fb</i> bensulfuron + Agri-Dex (1.0%)	0.2 0.06	PRE PREFL	0	0	0		0	0
Clomazone <i>fb</i> (propanil + molinate) + bensulfuron	0.2 4.5 0.06	PRE PREFL	0	0	0		0	0
Clomazone <i>fb</i> carfentrazone + AG-98 (0.25%)	0.5 0.02	DPRE PREFL	0	0	0		0	0
Clomazone <i>fb</i> propanil	0.5 3.0	DPRE PREFL	0	0	0		0	0
Quinclorac <i>fb</i> propanil	0.38 3.0	DPRE PREFL	0	0	0		0	0

continued

Herbicide Evaluation in Arkansas Rice, 1999

Table 29. Section 6. Continued.

Herbicide	Rate (lb/A)	Application timing	Rice biomass reduction					
			6/3	6/9	6/17	6/23	6/29	7/13
			----- (%) -----					
Clomazone <i>fb</i>	0.5	PRE						
carfentrazone + AG-98 (0.25%) <i>fb</i>	0.02	EPOST						
carfentrazone + AG-98 (0.25%)	0.02	PREFL	1	6	3	6	9	0
Clomazone <i>fb</i>	0.5	PRE						
carfentrazone + AG-98 (0.25%)	0.02	EPOST	0	13	5	10	9	0
Clomazone <i>fb</i>	0.5	PRE						
carfentrazone + bentazon + AG-98 (0.25%)	0.02 0.75	EPOST	4	0	4	8	8	0
Clomazone <i>fb</i>	0.5	PRE						
carfentrazone + (acifluorfen + bentazon) + AG-98 (0.25%)	0.02 0.25	EPOST	8	15	4	10	11	0
Clomazone <i>fb</i>	0.5	PRE						
carfentrazone + acifluorfen + AG-98 (0.25%)	0.02 0.125	EPOST	14	34	18	9	16	0
Carfentrazone + propanil	0.02 3.0	EPOST		0	0	0	0	0
Carfentrazone + propanil + thiobencarb	0.02 3.0 4.0	EPOST		0	0	0	0	0
Carfentrazone + propanil + pendimethalin	0.02 3.0 1.0	EPOST		0	0	0	0	0
Carfentrazone + (propanil + molinate)	0.02 4.5	EPOST		0	0	0	0	0
Carfentrazone + quinclorac + AG-98 (0.25%)	0.02 0.38	EPOST		3	0	0	0	0
Carfentrazone + fenoxaprop	0.02 0.067	EPOST		20	8	5	11	0
Carfentrazone + bispyribac-sodium + Kinetic (0.125%)	0.02 0.019	EPOST		1	0	0	0	0

continued

Table 29. Section 6. Continued.

Herbicide	Rate (lb/A)	Application timing	Rice biomass reduction					7/13
			6/3	6/9	6/17	6/23	6/29	
			----- (%) -----					
Carfentrazone + halosulfuron + AG-98 (0.25%)	0.02 0.047	EPOST		1	1	0	0	0
Carfentrazone + bensulfuron + AG-98 (0.25%)	0.02 0.063	EPOST		1	0	0	0	0
Quinclorac <i>fb</i> propanil + triclopyr	0.38 3.0 0.19	DPRE EPOST	0	1	0	0	0	0
LSD (0.05)			4	6	3	6	4	NS

continued

Table 29. Section 7.

Herbicide	Rate (lb/A)	Application timing	Effect on rice					Yield 9/16 (lb/A)	
			Injury						
			6/3	6/9	6/17	6/23	6/29	7/13	
			----- (%) -----						
Untreated check			0	0	0		0	0	5902
Clomazone	0.2	PRE	0	0	0		0	0	6417
Clomazone	0.5	PRE	0	0	0		0	0	6926
Clomazone	0.2	DPRE	0	0	0		0	0	6134
Clomazone	0.5	DPRE	0	0	0		0	0	6579
Clomazone + quinclorac	0.5 0.375	PRE	8	0	0		0	0	7119
Clomazone + quinclorac	0.2 0.19	PRE	3	0	0		0	0	6895
Clomazone + quinclorac	0.5 0.375	DPRE	0	0	0		1	0	6574
Clomazone + thiobencarb	0.5 4.0	DPRE	0	0	0		0	0	7010
Clomazone + thiobencarb	0.2 2.0	DPRE	0	0	0		0	0	7035
Clomazone + pendimethalin	0.2 1.0	DPRE	0	0	0		0	0	6167
Clomazone + quinclorac	0.2 0.19	DPRE	0	0	0		0	0	7316

continued

Table 29. Section 7. Continued.

Herbicide	Rate (lb/A)	Application timing	Effect on rice						Yield 9/16 (lb/A)
			Injury						
			6/3	6/9	6/17	6/23	6/29	7/13	
			----- (%) -----						
Clomazone <i>fb</i>	0.5								
carfentrazone + AG-98 (0.25%)	0.02	PRE							
		PREFL	0	0	0		3	0	7972
Clomazone <i>fb</i>	0.5	PRE							
propanil	3.0	PREFL	3	0	0		1	0	7981
Clomazone <i>fb</i>	0.2	PRE							
propanil	3.0	PREFL	0	0	0		0	0	7539
Clomazone <i>fb</i>	0.2	PRE							
bensulfuron + Agri-Dex (1.0%)	0.06	PREFL	0	0	0		0	0	7564
Clomazone <i>fb</i>	0.2	PRE							
(propanil + molinatate) + bensulfuron	4.5 0.06	PREFL	0	0	0		0	0	6844
Clomazone <i>fb</i>	0.5	DPRE							
carfentrazone + AG-98 (0.25%)	0.02	PREFL	0	0	0		3	0	5085
Clomazone <i>fb</i>	0.5	DPRE							
propanil	3.0	PREFL	0	0	0		0	0	5155
Quinclorac <i>fb</i>	0.38	DPRE							
propanil	3.0	PREFL	0	1	0		0	0	7504
Clomazone <i>fb</i>	0.5	PRE							
carfentrazone + AG-98 (0.25%) <i>fb</i>	0.02	EPOST							
carfentrazone + AG-98 (0.25%)	0.02	PREFL	20	13	1	19	13	0	5937
Clomazone <i>fb</i>	0.5	PRE							
carfentrazone + AG-98 (0.25%)	0.02	EPOST	20	16	13	18	14	0	5965
Clomazone <i>fb</i>	0.5	PRE							
carfentrazone + bentazon + AG-98 (0.25%)	0.02 0.75	EPOST	14	8	1	14	14	0	6815
Clomazone <i>fb</i>	0.5	PRE							
carfentrazone + (acifluorfen + bentazon) + AG-98 (0.25%)	0.02 0.25	EPOST	34	26	6	20	24	0	6488

continued

Table 29. Section 7. Continued.

Herbicide	Rate (lb/A)	Application timing	Effect on rice						Yield 9/16 (lb/A)
			Injury						
			6/3	6/9	6/17	6/23	6/29	7/13	
			----- (%) -----						
Clomazone <i>fb</i>	0.5	PRE							
carfentrazone +	0.02								
acifluorfen +	0.125								
AG-98 (0.25%)		EPOST	45	53	22	16	28	0	6672
Carfentrazone +	0.02								
propanil	3.0	EPOST		1	0	14	0	0	6730
Carfentrazone +	0.02								
propanil +	3.0								
thiobencarb	4.0	EPOST		3	0	13	0	0	7050
Carfentrazone +	0.02								
propanil +	3.0								
pendimethalin	1.0	EPOST		1	0	9	0	0	6822
Carfentrazone +	0.02								
(propanil +									
molinate)	4.5	EPOST		3	0	9	0	0	6705
Carfentrazone +	0.02								
quinclorac +	0.38								
AG-98 (0.25%)		EPOST		9	0	8	1	0	7778
Carfentrazone +	0.02								
fenoxaprop	0.067	EPOST		35	26	19	25	0	7232
Carfentrazone +	0.02								
bispyribac-sodium	0.019								
+ Kinetic (0.125%)		EPOST		4	0	9	0	0	6844
Carfentrazone +	0.02								
halosulfuron +	0.047								
AG-98 (0.25%)		EPOST		6	1	11	3	0	6350
Carfentrazone +	0.02								
bensulfuron +	0.063								
AG-98 (0.25%)		EPOST		8	0	6	0	0	6751
Quinclorac <i>fb</i>	0.38	DPRE							
propanil +	3.0								
triclopyr	0.19	EPOST	0	0	0	8	0	0	6978
LSD (0.05)			6	9	5	11	7	NS	1457

Table 30. Rice cultivar sensitivity to clomazone (Command 3 ME) at PRE applications, Stuttgart, 1999.

TEST INFORMATION

Location	Stuttgart	Planting date	May 12, 1999
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	6 ft by 16 ft	Crop / Variety	Rice / Many
Row width / Number of rows per plot	6.5 in. / 9 rows	Dates of flushing	May 16, 25, and June 10, 1999
Soil type ... Dewitt silt loam (4% sand, 82% silt, 14% clay)		Date of flooding	June 21, 1999
% OM / pH	1.0 / 5.4		

Comments: PRE = preemergence.

Application type	PRE
Date applied	5/12/99
Time	8:20 pm
Incorporation equipment	N/A
Air/Soil temperature (F)	78 / 76
Relative humidity (%)	62
Wind (mph)	2
Weather	mostly clear
Soil moisture	adequate
Crop stage/Height	N/A
Sprayer type/mph	BkPkCO ₂ / 3
Nozzle type/Size	Teejet / 110015
Boom ht / # Noz / Spacing (in.)	14 / 3 / 18
Gpa / Psi	10 / 24

Conclusions: Injury from clomazone was <38% 7 DAE for all rice cultivars and was minimal after 21 DAE. Cultivars differed in time to 50% heading, as expected for different maturity times for each cultivars. Yields were not significantly affected by clomazone at either rate when compared to the untreated check within a cultivar.

Table 30. Section 1.

Herbicide	Application		Effect on rice											
			Chlorosis						Biomass reduction					
	Rate (lb/A)	timing	5/26	6/2	6/9	6/17	7/1	7/15	5/26	6/2	6/9	6/17	7/1	7/15
----- (%) -----														
Drew														
Untreated check			0	1	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	3	3	1	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	23	21	9	2	0	0	5	6	4	1	0	0
Lemont														
Untreated check			0	1	1	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	1	1	0	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	2	8	3	1	0	0	0	3	0	0	0	0
Priscilla														
Untreated check			1	2	1	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	1	5	1	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	8	12	5	3	0	0	0	2	0	0	0	0
Experimental Cultivar #2														
Untreated check			0	3	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	0	5	0	0	0	0	0	1	0	0	0	0
Clomazone	0.6	PRE	3	5	2	1	0	0	0	0	0	0	0	0
Madison														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	4	3	0	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	38	30	11	3	0	0	10	14	4	1	0	0
Cypress														
Untreated check			0	1	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	2	3	0	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	5	24	5	2	0	0	0	4	1	0	0	0
Bengal														
Untreated check			0	1	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	1	5	0	0	0	0	0	1	0	0	0	0
Clomazone	0.6	PRE	2	19	4	3	0	0	0	3	0	1	0	0
Experimental Cultivar #4														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	2	2	0	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	4	9	3	1	0	0	0	1	0	0	0	0
Keybonnet														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	2	3	1	0	0	0	0	1	0	0	0	0
Clomazone	0.6	PRE	10	10	3	0	0	0	1	3	0	0	0	0

continued

Table 30. Section 1. Continued.

Herbicide	Application		Effect on rice											
			Chlorosis						Biomass reduction					
	Rate (lb/A)	timing	5/26	6/2	6/9	6/17	7/1	7/15	5/26	6/2	6/9	6/17	7/1	7/15
----- (%) -----														
LaGrue														
Untreated check			0	1	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	1	1	1	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	3	8	1	0	0	0	0	0	1	0	0	0
Wells														
Untreated check			0	1	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	4	3	0	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	34	24	4	1	0	0	8	9	3	1	0	0
Mars														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	2	5	0	0	0	0	0	1	0	0	0	0
Cocodrie														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	2	4	1	0	0	0	0	3	0	0	0	0
Clomazone	0.6	PRE	10	30	6	4	0	0	0	14	4	3	0	0
Experimental Cultivar #3														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	0	4	0	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	2	16	2	0	0	0	0	8	0	0	0	0
Koshihikari														
Untreated check			0	3	1	1	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	0	2	0	0	0	0	0	1	0	0	0	0
Clomazone	0.6	PRE	3	20	9	4	0	0	0	10	3	1	0	0
Experimental Cultivar #1														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	2	13	3	0	0	0	0	4	1	0	0	0
Clomazone	0.6	PRE	10	30	11	6	0	0	3	14	8	3	0	0
Jefferson														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	0	6	1	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	4	16	3	2	0	0	0	5	1	3	0	0
Experimental Cultivar #5														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	0	1	0	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	6	7	6	1	0	0	0	1	0	0	0	0
Diff sub for same main plot			8	9	4	3	NS	NS	3	4	3	2	NS	NS
Diff sub for different main plot			9	9	4	3	NS	NS	3	5	3	2	NS	NS

continued

Table 30. Section 2.

Herbicide	Rate (lb/A)	Application timing	Effect on rice								50% Heading DAE	Yield (lb/A)
			Injury					Lodging	8/26			
			5/26	6/2	6/9	6/17	7/1	7/15		(%)		
Drew												
Untreated check			0	0	0	0	0	0	0	0	77	7311
Clomazone	0.3	PRE	0	1	0	0	0	0	0	0	78	6694
Clomazone	0.6	PRE	9	14	3	0	0	0	0	0	77	6452
Lemont												
Untreated check			0	0	0	0	0	0	0	0	78	5746
Clomazone	0.3	PRE	0	0	0	0	0	0	0	0	79	7051
Clomazone	0.6	PRE	1	8	0	0	0	0	0	0	78	6062
Priscilla												
Untreated check			0	0	0	0	0	0	0	0	75	7298
Clomazone	0.3	PRE	0	2	0	0	0	0	0	0	75	7497
Clomazone	0.6	PRE	0	10	0	0	0	0	0	0	75	6215
Experimental Cultivar #2												
Untreated check			0	1	0	0	0	0	0	0	79	7244
Clomazone	0.3	PRE	0	4	0	0	0	0	0	0	79	7668
Clomazone	0.6	PRE	0	3	0	0	0	0	0	0	80	5934
Madison												
Untreated check			0	0	0	0	0	0	0	0	78	6061
Clomazone	0.3	PRE	1	2	0	0	0	0	0	0	79	5850
Clomazone	0.6	PRE	18	29	0	0	0	0	0	0	79	5342
Cypress												
Untreated check			0	0	0	0	0	0	0	0	76	5557
Clomazone	0.3	PRE	0	1	0	0	0	0	0	0	76	5612
Clomazone	0.6	PRE	0	16	0	0	0	0	0	0	76	6597
Bengal												
Untreated check			0	0	0	0	0	0	0	0	75	7714
Clomazone	0.3	PRE	0	2	0	0	0	0	0	0	75	6735
Clomazone	0.6	PRE	0	14	0	0	0	0	0	0	75	6676
Experimental Cultivar #4												
Untreated check			0	0	0	0	0	0	0	0	77	5991
Clomazone	0.3	PRE	0	1	0	0	0	0	0	0	76	6667
Clomazone	0.6	PRE	0	6	0	0	0	0	0	0	77	6140
Keybonnet												
Untreated check			0	8	0	0	0	0	0	0	76	5869
Clomazone	0.3	PRE	0	1	0	0	0	0	0	0	76	6862
Clomazone	0.6	PRE	1	8	0	0	0	0	0	0	75	6939

continued

Table 30. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Effect on rice								50% Heading DAE	Yield (lb/A)
			Injury					Lodging				
			5/26	6/2	6/9	6/17	7/1	7/15	8/26	(%)		
LaGrue												
Untreated check			0	0	0	0	0	0	0	0	75	7277
Clomazone	0.3	PRE	0	0	0	0	0	0	0	0	75	8180
Clomazone	0.6	PRE	0	4	0	0	0	0	0	0	75	7442
Wells												
Untreated check			0	0	0	0	0	0	0	0	75	6448
Clomazone	0.3	PRE	0	8	0	0	0	0	0	0	75	7169
Clomazone	0.6	PRE	13	19	0	0	0	0	0	0	75	7086
Mars												
Untreated check			0	0	0	0	0	0	0	0	77	5945
Clomazone	0.3	PRE	0	0	0	0	0	0	0	0	76	6584
Clomazone	0.6	PRE	0	3	0	0	0	0	0	0	77	6136
Cocodrie												
Untreated check			0	0	0	0	0	0	0	0	69	6640
Clomazone	0.3	PRE	0	5	0	0	0	0	0	0	69	6507
Clomazone	0.6	PRE	0	21	3	1	0	0	0	0	69	6840
Experimental Cultivar #3												
Untreated check			0	0	0	0	0	0	0	0	69	5586
Clomazone	0.3	PRE	0	1	0	0	0	0	0	0	68	5435
Clomazone	0.6	PRE	0	15	1	0	0	0	0	0	69	5669
Koshihikari												
Untreated check			0	0	0	0	0	0	0	0	69	7840
Clomazone	0.3	PRE	0	1	0	0	0	0	0	0	69	8427
Clomazone	0.6	PRE	0	16	1	0	0	0	0	0	69	6296
Experimental Cultivar #1												
Untreated check			0	0	0	0	0	0	0	0	69	5985
Clomazone	0.3	PRE	0	6	1	0	0	0	0	0	68	6755
Clomazone	0.6	PRE	1	21	5	3	0	0	0	0	68	6878
Jefferson												
Untreated check			0	0	0	0	0	0	0	0	69	7157
Clomazone	0.3	PRE	0	2	0	0	0	0	0	0	69	6912
Clomazone	0.6	PRE	0	14	1	1	0	0	0	0	68	6869
Experimental Cultivar #5												
Untreated check			0	0	0	0	0	0	0	0	69	7112
Clomazone	0.3	PRE	0	0	0	0	0	0	0	0	70	7962
Clomazone	0.6	PRE	0	4	0	0	0	0	0	0	69	8384
Diff sub for same main plot			3	8	2	1	NS	NS	NS	NS	1	1538
Diff sub for different main plot			3	9	2	1	NS	NS	NS	NS	1	1509

Table 31. Levee management with clomazone in a herbicide program in Arkansas rice, Stuttgart, 1999.**TEST INFORMATION**

Location	Stuttgart	Planting date	May 13, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 17, 1999
Plot size	10 ft by 16 ft	Crop / Variety	Rice / Drew
Row width / Number of rows per plot	6.5 in. / broadcast	Dates of flushing	May 16, 25, and June 10, 1999
Soil type ...	Dewitt silt loam (4% sand, 81% silt, 15% clay)	Date of flooding	June 21, 1999
% OM / pH	1.0 / 6.0		

Comments: PRE-A = preemergence - blanket treatment of clomazone prior to levee formation; PRE-B = preemergence - application of clomazone after levee formation; 2-3 LF = 2-3 leaf rice; and PREFL = prelood. Yield is adjusted to 12% moisture.

Application type	PRE-A	PRE-B	2-3 LF	PREFL
Date applied	5/13/99	5/13/99	6/9/99	6/18/99
Time	11:30 am	1:30 pm	2:00 pm	8:30 am
Incorporation equipment	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	77 / 85	81 / 88	92 / 96	69 / 70
Relative humidity (%)	56	60	55	66
Wind (mph)	4	5	4	4
Weather	clear	clear	partly cloudy	
Soil moisture	normal	normal	wet	wet
Crop stage/Height	N/A	N/A	3 lf / 6-8"	4-6 lf / 12-14"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Turbo Teejet / 110015 VP	Turbo Teejet / 110015 VP	Turbo Teejet / 110015 VP	XR Teejet / 11001 VS
Boom ht / # Noz / Spacing (in.)	14 / 5 / 18	14 / 3 / 18	14 / 3 / 18	14 / 3 / 18
Gpa / Psi	10 / 28	10 / 28	10 / 28	10 / 42
Weed species (density)	----- [# leaves/height (in.)] -----			
S-ECHCG (25/row ft)	N/A	N/A	2-3 lf / 1.5"	3 lf / 3"
R-ECHCG (35+/row ft)	N/A	N/A	2-3 lf / 1.5"	3-4 lf / 3-4"

Conclusions: Clomazone at 0.4 lb/A PRE failed to control barnyardgrass adequately when applied prior to levee formation with a levee plow. A sequential application was needed to give season-long control. Sequential programs with quinclorac, fenoxaprop + safener, and bispyribac-sodium gave >88% control of propanil-resistant and -susceptible barnyardgrass. Susceptible barnyardgrass was also controlled with propanil.

Table 31. Section 1.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass control							
			Resistant (R-ECHCG)				Susceptible (ECHCG)			
			6/9	6/18	6/29	7/13	6/9	6/18	6/29	7/13
			----- (%) -----							
Clomazone	0.4	PRE-A	0	0	0	0	0	0	0	0
Clomazone <i>fb</i>	0.4	PRE-A								
clomazone	0.2	PRE-B	99	100	97	95	100	100	97	95
Clomazone <i>fb</i>	0.4	PRE-A								
propanil	4.0	2-3 LF	0	23	34	25	0	69	79	76
Clomazone <i>fb</i>	0.4	PRE								
propanil	4.0	PREFL	0	10	63	45	0	35	75	84
Clomazone <i>fb</i>	0.4	PRE-A								
propanil	4.0	2-3 LF	0	79	79	56	0	98	86	96
Clomazone <i>fb</i>	0.4	PRE-A								
clomazone <i>fb</i>	0.2	PRE-B								
propanil	4.0	2-3 LF	98	100	93	96	98	100	90	95
Clomazone <i>fb</i>	0.4	PRE-A								
(fenoxaprop + safener)	0.098	2-3 LF	0	99	88	92	0	96	88	95
Clomazone <i>fb</i>	0.4	PRE								
clomazone +	0.4									
propanil	4.0	2-3 LF	0	98	84	90	0	96	89	93
Clomazone <i>fb</i>	0.4	PRE								
quinclorac +	0.25									
AG-98 (0.25%)		2-3 LF	0	93	95	94	0	97	96	98
Clomazone <i>fb</i>	0.4	PRE								
quinclorac +	0.25									
propanil	4.0	2-3 LF	0	100	90	96	0	100	94	99
Clomazone <i>fb</i>	0.4	PRE								
bispyribac-sodium +	0.02									
Kinetic (0.125%)		PREFL	0	0	75	96	0	0	74	99
Clomazone <i>fb</i>	0.4	PRE								
propanil +	4.0									
bispyribac-sodium +	0.02									
Kinetic (0.125%)		PREFL	0	50	75	88	0	55	79	89
Clomazone <i>fb</i>	0.4	PRE								
propanil +	4.0									
triclopyr	0.25	PREFL	0	20	68	26	0	35	86	68
LSD (0.05)			1	31	22	22	1	34	15	22

continued

Table 31. Section 2.

Herbicide	Application		Effect on rice									
	Rate (lb/A)	timing	Chlorosis						Biomass reduction			
			5/26	6/3	6/9	6/18	6/29	7/13	6/9	6/18	6/29	7/13
			----- (%) -----									
Clomazone	0.4	PRE-A	4	3	4	9	11	0	0	0	0	0
Clomazone <i>fb</i>	0.4	PRE-A										
clomazone	0.2	PRE-B	5	3	2	0	1	0	0	0	0	0
Clomazone <i>fb</i>	0.4	PRE-A										
propanil	4.0	2-3 LF	3	1	4	0	6	0	0	0	0	0
Clomazone <i>fb</i>	0.4	PRE										
propanil	4.0	PREFL	4	2	5	1	5	0	0	0	0	0
Clomazone <i>fb</i>	0.4	PRE-A										
propanil	4.0	2-3 LF	5	1	3	1	6	0	0	0	0	0
Clomazone <i>fb</i>	0.4	PRE-A										
clomazone <i>fb</i>	0.2	PRE-B										
propanil	4.0	2-3 LF	5	4	6	0	5	0	0	0	0	0
Clomazone <i>fb</i>	0.4	PRE-A										
(fenoxaprop + safener)	0.098	2-3 LF	2	0	4	0	1	0	0	0	0	0
Clomazone <i>fb</i>	0.4	PRE										
clomazone +	0.4											
propanil	4.0	2-3 LF	2	3	3	3	6	0	0	0	0	0
Clomazone <i>fb</i>	0.4	PRE										
quinclorac +	0.25											
AG-98 (0.25%)		2-3 LF	3	3	1	0	1	0	0	0	0	0
Clomazone <i>fb</i>	0.4	PRE										
quinclorac +	0.25											
propanil	4.0	2-3 LF	3	3	3	0	3	0	0	0	0	0
Clomazone <i>fb</i>	0.4	PRE										
bispyribac-sodium +	0.02											
Kinetic (0.125%)		PREFL	4	3	4	4	3	0	0	0	0	0
Clomazone <i>fb</i>	0.4	PRE										
propanil +	4.0											
bispyribac-sodium +	0.02											
Kinetic (0.125%)		PREFL	3	2	3	3	6	0	0	0	0	0
Clomazone <i>fb</i>	0.4	PRE										
propanil +	4.0											
triclopyr	0.25	PREFL	3	3	1	0	8	0	0	0	0	0
LSD (0.05)			NS	NS	NS	4	5	NS	NS	NS	NS	NS

continued

Table 31. Section 3.

Herbicide	Rate (lb/A)	Application timing	Effect on rice				Yield 9/17 (lb/A)
			Injury				
			6/9	6/18	6/29	7/13	
			----- (%) -----				
Clomazone	0.4	PRE-A	0	0	0	0	2391
Clomazone <i>fb</i>	0.4	PRE-A					
clomazone	0.2	PRE-B	0	0	0	0	3652
Clomazone <i>fb</i>	0.4	PRE-A					
propanil	4.0	2-3 LF	0	0	0	0	1636
Clomazone <i>fb</i>	0.4	PRE					
propanil	4.0	PREFL	0	0	0	0	2195
Clomazone <i>fb</i>	0.4	PRE-A					
propanil	4.0	2-3 LF	0	0	0	0	2489
Clomazone <i>fb</i>	0.4	PRE-A					
clomazone <i>fb</i>	0.2	PRE-B					
propanil	4.0	2-3 LF	0	0	0	0	4072
Clomazone <i>fb</i>	0.4	PRE-A					
(fenoxaprop + safener)	0.098	2-3 LF	0	0	0	0	4437
Clomazone <i>fb</i>	0.4	PRE					
clomazone +	0.4						
propanil	4.0	2-3 LF	0	0	0	0	3572
Clomazone <i>fb</i>	0.4	PRE					
quinclorac +	0.25						
AG-98 (0.25%)		2-3 LF	0	0	0	0	4712
Clomazone <i>fb</i>	0.4	PRE					
quinclorac +	0.25						
propanil	4.0	2-3 LF	0	0	0	0	3706
Clomazone <i>fb</i>	0.4	PRE					
bispyribac-sodium +	0.02	PRE					
Kinetic (0.125%)		PREFL	0	0	0	0	3800
Clomazone <i>fb</i>	0.4	PRE					
propanil +	4.0						
bispyribac-sodium +	0.02						
Kinetic (0.125%)		PREFL	0	0	0	0	2993
Clomazone <i>fb</i>	0.4	PRE					
propanil +	4.0						
triclopyr	0.25	PREFL	0	0	0	0	2538
LSD (0.05)			NS	NS	NS	NS	NS

Table 32. Evaluation of planting date on the phytotoxic effects of clomazone, Stuttgart, 1999.**TEST INFORMATION**

Location	Stuttgart	Planting date	April 13, May 12, and June 16, 1999
Experimental Design / replications	RCB / 4	Harvest date	See comments
Plot size	6 ft by 16 ft	Crop / Variety	Rice / Drew
Row width / Number of rows per plot	6.5 in. / 9 rows	Dates of flushing	See comments
Soil type ...	Dewitt silt loam (4% sand, 81% silt, 15% clay)	Date of flooding	See comments
% OM / pH	1.0 / 5.4		

Comments: PRE = preemergence. This test had three different planting dates: April 13, May 12, and June 16, 1999. The flushing dates for each planting are: Planting date #1: flushed April 4, April 9, May 16, and May 25, flooded June 4, and harvested August 26; Planting date #2: flushed May 16, May 25, and June 10, flooded, June 16, and harvested, September 16; and Planting date #3: flushed June 21, July 8, and July 19, flooded, July 27, and harvested, November 11. This test was solely to evaluate effect on rice. POST treatments were applied as needed to control all weeds so that weed-free yield comparisons could be made. No additional herbicides were required for planting date #3. Yield is adjusted to 12% moisture.

Application type	PRE (Planting date 1)	PRE (Planting date 2)	PRE (Planting date 3)
Date applied	4/13/99	5/12/99	6/18/99
Time	6:20	8:20	8:30 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	60 / 70	78 / 76/	69 / 70
Relative humidity (%)	60	62	66
Wind (mph)	4	2	3
Weather	mostly cloudy	mostly clear	clear
Soil moisture	normal	normal	normal
Crop stage/Height	N/A	N/A	N/A
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Turbo Teejet / 110015 VP	Turbo Teejet / 110015 VP	XR Teejet / 11001 VS
Boom ht / # Noz / Spacing (in.)	14 / 3 / 18	14 / 3 / 18	14 / 3 / 18
Gpa / Psi	15 / 38	10 / 28	10 / 42

Conclusions: Injury from clomazone was highest in the earliest planting date of April with injury highest at 0.6 lb ai/A (55%) at 7 DAE. This level of injury was minimal after 35 DAE. May's planting date followed similar trends with injury minimal after 21 DAE. Minimal injury was seen with June's planting date. Overall, earlier planting resulted in higher injury that persisted longer as compared to later planting.

Table 32. Section 1.

Herbicide	Rate (lb/A)	Application timing	Rice chlorosis						
			7 DAE	14 DAE	21 DAE	28 DAE	35 DAE	42 DAE	56 DAE
			----- (%) -----						
Planting Date #1: These treatments were all sprayed with propanil, 3.0 + halosulfuron, 0.06, POST for weed control.									
Check			0	0	0	0	0	0	0
Clomazone	0.3	PRE	10	7	6	2	0	0	0
Clomazone	0.6	PRE	58	58	50	18	0	0	0
Planting Date #2: These treatments were all sprayed with propanil, 3.0, POST for weed control.									
Check			0	0	0	0	0	0	0
Clomazone	0.3	PRE	14	10	1	0	0	0	0
Clomazone	0.6	PRE	45	39	6	0	0	0	0
Planting Date #3: These treatments did not receive a weed control application.									
Check			0	0	0	0	0	0	0
Clomazone	0.3	PRE	5	0	0	0	0	0	0
Clomazone	0.6	PRE	14	6	2	0	0	0	0
LSD (0.05)			11	9	4	3	NS	NS	NS

continued

Table 32. Section 2.

Herbicide	Rate (lb/A)	Application timing	Rice biomass reduction						
			7 DAE	14 DAE	21 DAE	28 DAE	35 DAE	42 DAE	56 DAE
			----- (%) -----						
Planting Date #1: These treatments were all sprayed with propanil, 3.0 + halosulfuron, 0.06, POST for weed control.									
Check			0	0	0	0	0	0	0
Clomazone	0.3	PRE	0	6	3	0	0	0	0
Clomazone	0.6	PRE	9	34	39	35	0	0	0
Planting Date #2: These treatments were all sprayed with propanil, 3.0, POST for weed control.									
Check			0	0	0	0	0	0	0
Clomazone	0.3	PRE	0	0	0	0	0	0	0
Clomazone	0.6	PRE	3	8	1	1	0	0	0
Planting Date #3: These treatments did not receive a weed control application.									
Check			0	0	0	0	0	0	0
Clomazone	0.3	PRE							
Clomazone	0.6	PRE	0	3	1	0	0	0	0
LSD (0.05)			2	9	4	7	NS	NS	NS

continued

Table 32. Section 3.

Herbicide	Rate (lb/A)	Application timing	Effect on rice							Yield (lb/A)
			Injury							
			7 DAE	14 DAE	21 DAE	28 DAE	35 DAE	42 DAE	56 DAE	
			----- (%) -----							
Planting Date #1: These treatments were all sprayed with propanil, 3.0 + halosulfuron, 0.06, POST for weed control.										
Check			0	0	0	0	0	0	0	9572
Clomazone	0.3	PRE	6	8	6	0	0	0	0	10422
Clomazone	0.6	PRE	19	41	55	21	0	0	0	9048
Planting Date #2: These treatments were all sprayed with propanil, 3.0, POST for weed control.										
Check			0	0	0	0	0	0	0	8976
Clomazone	0.3	PRE	1	1	1	0	0	0	0	10672
Clomazone	0.6	PRE	11	16	3	0	0	0	0	10214
Planting Date #3: These treatments did not receive a weed control application.										
Check			0	0	0	0	0	0	0	4399
Clomazone	0.3	PRE	0	0	0	0	0	0	0	6623
Clomazone	0.6	PRE	0	3	2	0	0	0	0	4789
LSD (0.05)			7	10	6	8	NS	NS	NS	1311

Table 33. Rice cultivar sensitivity to clomazone (Command 3 ME) at PRE applications, Pine Tree, 1999.

TEST INFORMATION

Location	Pine Tree	Planting date	May 27, 1999
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	5 ft by 15 ft	Crop / Variety	Rice / Many
Row width / Number of rows per plot	8 in. / 8 rows	Date of flooding	June 29, 1999
Soil type	Calloway silt loam (2% sand, 82% silt, 16% clay)		
% OM / pH	1.0 / 6.8		

Comments: PRE = preemergence; and 3-4 LF = 3- to 4-leaf rice. Yield is adjusted to 12% moisture.

Application type	PRE	3-4 LF
Date applied	5/25/99	9/17/99
Time	6:30 pm	2:30 pm
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	74 / 79	73 / 100
Relative humidity (%)	82	45
Wind (mph)	0	3
Weather	mostly cloudy	
Soil moisture	dry	dry
Crop stage/Height	N/A	4 lf / 10-14"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	XR Teejet / 110015 VS	Turbo Teejet / 11002 DG
Boom ht / # Noz / Spacing (in.)	14 / 3 / 18	14 / 3 / 20
Gpa / Psi	10 / 28	10 / 26
Weed species (density)	----- [# leaves/height (in.)] -----	
BRAPP (1-2/sq ft)	N/A	7-8 lf / 7"
ECHCG (3/sq ft)	N/A	3-4 lf / 6-7"
AMACH (0.25/sq ft)	N/A	9 lf / 7"

Conclusions: Chlorosis injury caused by clomazone was <43% at 7 DAE for all cultivars and was 0% after 35 DAE. Overall rice injury was minimal for most cultivars with the exception of Exp Cult.1 (46%) and Koshihikari (21%) at 28 DAE. Yield was not significantly affected by clomazone at either rate as compared to the untreated check within a cultivar.

Table 33. Section 1.

Herbicide	Application		Effect on rice											
			Chlorosis						Biomass reduction					
	Rate (lb/A)	timing	6/3	6/8	6/17	6/24	7/7	7/23	6/3	6/8	6/17	6/24	7/7	7/23
Cocodrie														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	4	0	0	0	0	0	0	0	1	0	0	0
Clomazone	0.6	PRE	13	10	3	3	0	0	0	0	0	0	0	0
Experimental Cultivar #3														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	3	0	0	0	0	0	0	0	6	0	1	0
Clomazone	0.6	PRE	11	5	0	1	0	0	0	0	0	0	0	0
Koshihikari														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	6	2	0	0	0	0	0	0	6	4	14	0
Clomazone	0.6	PRE	13	11	14	21	0	0	0	0	0	0	0	0
Experimental Cultivar #1														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	14	3	2	0	0	0	0	3	1	0	0	0
Clomazone	0.6	PRE	43	31	18	13	0	0	0	3	21	15	26	0
Jefferson														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	7	2	0	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	21	8	2	2	0	0	0	3	5	0	1	0
Experimental Cultivar #5														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	4	2	0	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	11	14	7	5	0	0	0	0	6	0	4	0
Bengal														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	5	1	0	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	24	24	6	3	0	0	0	0	3	5	1	0
Experimental Cultivar #4														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	2	1	0	1	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	13	19	0	2	0	0	0	0	4	0	1	0
Keybonnet														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	1	1	0	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	10	7	0	0	0	0	0	0	1	0	0	0

continued

Table 33. Section 1. Continued.

Herbicide	Application		Effect on rice											
	Rate (lb/A)	timing	Chlorosis						Biomass reduction					
			6/3	6/8	6/17	6/24	7/7	7/23	6/3	6/8	6/17	6/24	7/7	7/23
			----- (%) -----											
LaGrue														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	1	1	0	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	3	4	0	0	0	0	0	0	0	0	0	0
Wells														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	1	0	1	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	19	7	4	2	0	0	0	1	0	0	0	0
Mars														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	2	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	13	6	0	0	0	0	0	0	0	0	0	0
Drew														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	1	1	0	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	8	12	2	2	0	0	0	3	0	0	0	0
Lemont														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	1	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	6	9	1	1	0	0	0	5	0	1	0	0
Priscilla														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	2	1	0	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	6	9	3	3	0	0	0	3	0	0	0	0
Experimental Cultivar #2														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	3	3	0	0	0	0	0	0	0	0	0	0
Madison														
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	0	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	5	6	3	0	0	0	0	3	1	0	0	0
Cypress														
Untreated check			1	0	0	0	0	0	0	0	0	0	0	0
Clomazone	0.3	PRE	2	1	0	0	0	0	0	0	0	0	0	0
Clomazone	0.6	PRE	5	5	3	2	0	0	0	5	1	2	0	0
Diff sub for same main plot			5	8	4	3	NS	NS	1	5	4	7	NS	NS
Diff sub for different main plot			6	7	4	3	NS	NS	1	5	5	6	NS	NS

continued

Table 33. Section 2.

Herbicide	Rate (lb/A)	Application timing	Effect on rice							Yield 9/17 (lb/A)
			Injury						Lodging	
			6/3	6/8	6/17	6/24	7/7	7/23	9/17	
			----- (%) -----							
Cocodrie										
Untreated check			0	0	0	0	0	0	0	9497
Clomazone	0.3	PRE	0	0	0	0	0	0	0	10332
Clomazone	0.6	PRE	0	6	0	2	0	0	0	10501
Experimental Cultivar #3										
Untreated check			0	0	0	0	0	0	0	8326
Clomazone	0.3	PRE	0	0	0	0	0	0	0	7618
Clomazone	0.6	PRE	0	9	0	1	0	0	0	7838
Koshihikari										
Untreated check			0	0	0	0	0	0	0	7313
Clomazone	0.3	PRE	1	0	0	0	0	0	8	6617
Clomazone	0.6	PRE	3	13	3	21	0	0	25	7744
Experimental Cultivar #1										
Untreated check			0	0	0	0	0	0	0	6116
Clomazone	0.3	PRE	6	1	0	1	0	0	0	8767
Clomazone	0.6	PRE	13	30	15	46	0	0	0	8125
Jefferson										
Untreated check			0	0	0	0	0	0	0	7448
Clomazone	0.3	PRE	0	0	0	0	0	0	0	8883
Clomazone	0.6	PRE	4	6	0	1	0	0	0	9116
Experimental Cultivar #5										
Untreated check			0	0	0	0	0	0	0	10048
Clomazone	0.3	PRE	0	0	0	0	0	0	0	10498
Clomazone	0.6	PRE	0	5	0	4	0	0	0	11037
Bengal										
Untreated check			0	0	0	0	0	0	0	12022
Clomazone	0.3	PRE	0	0	0	0	0	0	0	10542
Clomazone	0.6	PRE	0	5	4	0	0	0	0	11783
Experimental Cultivar #4										
Untreated check			0	0	0	0	0	0	0	11641
Clomazone	0.3	PRE	0	0	0	0	0	0	0	12579
Clomazone	0.6	PRE	0	8	0	1	0	0	0	11861
Keybonnet										
Untreated check			0	0	0	0	0	0	0	8065
Clomazone	0.3	PRE	0	0	0	0	0	0	0	7914
Clomazone	0.6	PRE	0	1	0	0	0	0	0	9400

continued

Herbicide Evaluation in Arkansas Rice, 1999

Table 33. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Effect on rice							Yield 9/17 (lb/A)
			Injury					Lodging 9/17		
			6/3	6/8	6/17	6/24	7/7		7/23	
LaGrue										
Untreated check			0	0	0	0	0	0	0	11625
Clomazone	0.3	PRE	0	0	0	0	0	0	0	9910
Clomazone	0.6	PRE	0	1	0	0	0	0	0	11074
Wells										
Untreated check			0	0	0	0	0	0	0	11178
Clomazone	0.3	PRE	0	0	0	0	0	0	0	10473
Clomazone	0.6	PRE	0	4	0	3	0	0	0	11326
Mars										
Untreated check			0	0	0	0	0	0	0	9305
Clomazone	0.3	PRE	0	0	0	0	0	0	0	12006
Clomazone	0.6	PRE	0	1	0	0	0	0	0	11921
Drew										
Untreated check			0	0	0	0	0	0	0	10105
Clomazone	0.3	PRE	0	0	0	0	0	0	0	10505
Clomazone	0.6	PRE	0	5	0	0	0	0	0	10102
Lemont										
Untreated check			0	0	0	0	0	0	0	11106
Clomazone	0.3	PRE	0	0	0	0	0	0	0	10234
Clomazone	0.6	PRE	0	4	0	0	0	0	0	10410
Pricsilla										
Untreated check			0	0	0	0	0	0	0	11839
Clomazone	0.3	PRE	0	0	0	0	0	0	0	10763
Clomazone	0.6	PRE	0	3	0	1	0	0	0	10489
Experimental Cultivar #2										
Untreated check			0	0	0	0	0	0	0	11984
Clomazone	0.3	PRE	0	0	0	0	0	0	0	11493
Clomazone	0.6	PRE	0	0	0	0	0	0	0	9869
Madison										
Untreated check			0	0	0	0	0	0	0	10542
Clomazone	0.3	PRE	0	0	0	0	0	0	0	11115
Clomazone	0.6	PRE	0	3	0	0	0	0	0	9844
Cypress										
Untreated check			0	0	0	0	0	0	0	9692
Clomazone	0.3	PRE	0	0	0	0	0	0	0	10807
Clomazone	0.6	PRE	0	1	0	2	0	0	0	9699
Diff sub for same main plot			1	5	4	4	NS	NS	6	2320
Diff sub for different main plot			2	4	4	4	NS	NS	7	2360

Table 34. Postemergence herbicides following clomazone (Command), Rohwer, 1999.**TEST INFORMATION**

Location	Rohwer	Planting date	April 23, 1999
Experimental Design / replications	RCB / 4	Harvest date	October 12, 1999
Plot size	5 ft by 17 ft	Crop / Variety	Rice / Lemont
Row width / Number of rows per plot	6 in. / 8 rows	Dates of flushing	April 26, May 4, 11, and 27, 1999
Soil type	clay loam (8% sand, 49% silt, 43% clay)	Date of flooding	June 11, 1999
% OM / pH	3.5 / 6.7		

Comments: DPRE = delayed preemergence; EPOST = early postemergence; and PREFL = pre-flood.

Application type	DPRE	EPOST	PREFL
Date applied	5/3/99	5/17/99	6/9/99
Time	7:30 am	8:00 am	9:00 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	74 / 68	77 / 78	82 / 80
Relative humidity (%)	63	45	65
Wind (mph)	6	5	4
Weather	cloudy	partly cloudy	
Soil moisture	optimal	optimal	optimal
Crop stage/Height	N/A	2-3 lf / 3.5"	2-5 lf / 6"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Flat fan / 8002	Flat fan / 8002	Flat fan / 8002
Boom ht / # Noz / Spacing (in.)	22 / 3 / 19	22 / 3 / 19	22 / 3 / 19
Gpa / Psi	15 / 22	15 / 22	15 / 25
Weed species		(# leaves)	
SEBEX	N/A	2-3 lf	4-6 lf
IPOLA	N/A	2-4 lf	4-6 lf
IPOWR	N/A	2-3 lf	4-6 lf

Conclusions: Clomazone did not cause unacceptable bleaching of rice. Slight injury, in the form of necrotic areas on rice leaves, from EPOST applications was not noticeable 2 to 3 weeks after application. EPOST applications of all herbicides controlled existing hemp sesbania and morningglory. By permanent flood, seedlings of both species were abundant. The postflood evaluation showed that these two weeds were controlled with the flood.

Table 34. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Hemp sesbania (SEBEX)				Pitted morningglory (IPOLA)	Palmleaf morningglory (IPOWER)
			5/18	5/26	6/9	7/15	6/9	7/15
Untreated check			0	0	0	0	3	0
Clomazone <i>fb</i>	0.5	DPRE						
bensulfuron + propanil	0.04 3.0	DPRE PREFL	0	50	0	100	0	100
Clomazone <i>fb</i> [bensulfuron + propanil (Duet)]	0.5 3.0	DPRE PREFL	0	50	0	100	0	100
Clomazone <i>fb</i> [bensulfuron + propanil + molinate (Super Duet)]	0.5 3.0	DPRE PREFL	0	25	0	100	0	98
Clomazone <i>fb</i> propanil <i>fb</i>	0.5 3.0	DPRE EPOST						
bensulfuron + propanil	0.04 3.0	DPRE PREFL	0	98	79	100	91	100
Clomazone <i>fb</i> propanil <i>fb</i> (bensulfuron + propanil)	0.5 3.0 3.0	DPRE EPOST PREFL	0	100	70	100	71	100
Clomazone <i>fb</i> propanil <i>fb</i> (bensulfuron + propanil + molinate)	0.5 3.0 3.0	DPRE EPOST PREFL	0	99	74	100	75	100
Clomazone <i>fb</i> propanil + bensulfuron <i>fb</i>	0.5 3.0 0.02	DPRE EPOST						
bensulfuron + propanil	0.02 3.0	DPRE PREFL	0	99	71	100	94	100
Clomazone <i>fb</i> (bensulfuron + propanil) <i>fb</i>	0.5 3.0	DPRE EPOST						
(bensulfuron + propanil)	3.0	PREFL	0	100	73	100	100	100
Clomazone <i>fb</i> (bensulfuron + propanil + molinate) <i>fb</i>	0.5 3.0	DPRE EPOST						
(bensulfuron + propanil + molinate)	3.0	PREFL	0	75	86	100	100	100
LSD (0.05)			NS	44	26	1	20	2

continued

Table 34. Section 2.

Herbicide	Rate (lb/A)	Application timing	Effect on rice					Yield (lb/A)
			Bleaching		Injury			
			5/18	5/26	5/26	6/9	7/15	
Untreated check			5	0	0	0	0	0
Clomazone <i>fb</i>	0.5	DPRE						
bensulfuron + propanil	0.04 3.0	PREFL	8	3	0	0	0	7155
Clomazone <i>fb</i> [bensulfuron + propanil (Duet)]	0.5 3.0	DPRE PREFL	8	3	0	0	0	7155
Clomazone <i>fb</i> [bensulfuron + propanil + molinate (Super Duet)]	0.5 3.0	DPRE PREFL	6	3	0	0	0	7020
Clomazone <i>fb</i> propanil <i>fb</i> bensulfuron + propanil	0.5 3.0 0.04 3.0	DPRE EPOST PREFL	9	2	10	3	0	7200
Clomazone <i>fb</i> propanil <i>fb</i> (bensulfuron + propanil)	0.5 3.0 3.0	DPRE EPOST PREFL	9	3	10	5	0	6795
Clomazone <i>fb</i> propanil <i>fb</i> (bensulfuron + propanil + molinate)	0.5 3.0 3.0	DPRE EPOST PREFL	4	1	6	0	0	7155
Clomazone <i>fb</i> propanil + bensulfuron <i>fb</i> bensulfuron + propanil	0.5 3.0 0.02 0.02 3.0	DPRE EPOST PREFL	4	2	10	1	0	7335
Clomazone <i>fb</i> (bensulfuron + propanil) <i>fb</i> (bensulfuron + propanil)	0.5 3.0 3.0	DPRE EPOST PREFL	5	2	6	1	0	6885
Clomazone <i>fb</i> (bensulfuron + propanil + molinate) <i>fb</i> (bensulfuron + propanil + molinate)	0.5 3.0 3.0	DPRE EPOST PREFL	9	3	12	1	0	6930
LSD (0.05)			NS	NS	7	NS	NS	567

Table 35. Postemergence programs following clomazone (Command), Rohwer, 1999.

TEST INFORMATION

Location	Rohwer	Planting date	April 22, 1999
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	5 ft by 17 ft	Crop / Variety	Rice / Lemont
Row width / Number of rows per plot	6 in. / 8 rows	Dates of flushing	April 26, May 4, 11, and 27, 1999
Soil type	clay loam (8% sand, 49% silt, 43% clay)	Date of flooding	June 11, 1999
% OM / pH	3.5 / 6.7		

Comments: PRE = preemergence; DPRE = delayed preemergence; EPOST = early postemergence; PREFL = pre-flood; and POFL = postflood.

Application type	PRE	DPRE	EPOST	PREFL	POFL
Date applied	4/23/99	5/4/99	5/17/99	6/6/99	6/21/99
Time	7:00 am	7:30 am	8:00 am	10:00 am	9:00 am
Incorporation equipment	N/A	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	55 / 58	67 / 67	79 / 80	78 / 80	87 / 70
Relative humidity (%)	45	35	65	60	52
Wind (mph)	3	4	7	6	4
Weather	clear	cloudy	partly cloudy	clear	
Crop stage/Height	N/A	N/A	2-3 lf / 3.5"	4-5 lf / 6"	5 lf / 12"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Flat fan / 8002	Flat fan / 8002	Flat fan / 8002	Flat fan / 8002	Flat fan / 11002
Boom ht / # Noz / Spacing (in.)	22 / 3 / 19	22 / 3 / 19	22 / 3 / 19	22 / 3 / 19	22 / 3 / 19
Gpa / Psi	15 / 22	15 / 22	15 / 22	15 / 25	15 / 22
Weed species	----- (# leaves) -----				
SEBEX	N/A	N/A	2-3 lf	4-5 lf	5-6 lf
ECHCG	N/A	N/A	2-3 lf	4-5 lf	5-6 lf

Conclusions: Clomazone (Command) and quinclorac (Facet) provided greater than 95% control of barnyardgrass with no injury. Quinclorac gave greater than 90% control of hemp sesbania 21 days after treatment, while treatments that included clomazone had no broadleaf control. Carfentrazone (Aim) at 0.02 lb ai/A controlled hemp sesbania 80% at PREFL, while carfentrazone at 0.03 lb ai/A increased PRELF control to 85%. Propanil (Stam) at 3.0 lb ai/A provided 95% control of hemp sesbania following clomazone and 100% control following quinclorac. Bispyribac-sodium (Regiment) at 0.04 lb ai/A and triclopyr (Grandstand) at 0.28 lb ai/A both provided less than 80% control of hemp sesbania at PREFL applications.

Table 35.

Herbicide	Rate (lb/A)	Application timing	Weed control				Effect on rice	
			Hemp sesbania (SEBEX)			Barnyardgrass (ECHCG)	Bleaching	Injury
			5/18	6/9	7/19	6/9	5/18	7/19
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Clomazone <i>fb</i> carfentrazone	0.5 0.02	PRE PREFL	24	0	83	100	6	0
Clomazone <i>fb</i> propanil	0.5 3.0	PRE PREFL	0	0	95	94	5	0
Clomazone <i>fb</i> carfentrazone	0.5 0.02	DPRE PREFL	24	0	79	88	3	0
Clomazone <i>fb</i> propanil	0.5 3.0	DPRE PREFL	8	0	98	100	3	0
Quinclorac <i>fb</i> propanil	0.38 3.0	DPRE PREFL	90	49	100	100	0	0
Clomazone <i>fb</i> carfentrazone	0.5 0.03	PRE PREFL	0	8	85	100	3	0
Clomazone + quinclorac	0.5 0.38	DPRE	93	85	76	100	8	0
Clomazone + thiobencarb	0.5 4.0	DPRE	58	39	28	100	5	0
Clomazone <i>fb</i> bispyribac-sodium	0.5 0.02	PRE PREFL	0	10	79	100	3	0
Clomazone <i>fb</i> triclopyr	0.5 0.28	PRE POFL	13	25	74	100	4	0
Clomazone <i>fb</i> (fenoxaprop + safener)	0.5 0.08	PRE EPOST	0	0	15	100	10	0
Quinclorac + bispyribac-sodium	0.38 0.02	DPRE	95	84	69	100	0	0
Quinclorac <i>fb</i> triclopyr	0.38 0.28	DPRE POFL	93	69	89	100	0	0
Quinclorac <i>fb</i> (fenoxaprop + safener)	0.38 0.08	DPRE EPOST	90	86	80	100	0	0
LSD (0.05)			31	27	17	10	6	NS

Table 36. Broadleaf control following clomazone (Command), Rohwer, 1999.

TEST INFORMATION

Location	Rohwer	Planting date	April 24, 1999
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	5 ft by 17 ft	Crop / Variety	Rice / Lemont
Row width / Number of rows per plot	6 in. / 8 rows	Dates of flushing	April 26, May 4, 11, and 27, 1999
Soil type	clay loam (8% sand, 49% silt, 43% clay)	Date of flooding	June 11, 1999
% OM / pH	3.5 / 6.7		

Comments: PRE = preemergence; EPOST = early postemergence; MPOST = mid-postemergence; PREFL = pre-flood; and POFL = postflood.

Application type	PRE	EPOST	MPOST	PREFL	POFL
Date applied	4/23/99	5/15/99	5/26/99	6/9/99	6/21/99
Time	7:45 am	8:30 am	7:00 am	11:00 am	9:00 am
Incorporation equipment	N/A	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	69 / 54	80 / 80	70 / 70	80 / 80	87 / 74
Relative humidity (%)	60	62	70	70	51
Wind (mph)	6	8	4	6	4
Weather	clear	partly cloudy	cloudy	clear	
Crop stage/Height	N/A	3"	4.5"	4-5 lf / 6"	6 lf / 12"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Flat fan / 8002	Flat fan / 8002	Flat fan / 8002	Flat fan / 8002	Flat fan / 8002
Boom ht / # Noz /					
Spacing (in.)	22 / 3 / 19	22 / 3 / 19	22 / 3 / 19	22 / 3 / 19	22 / 3 / 19
Gpa / Psi	15 / 22	15 / 22	15 / 22	15 / 22	15 / 22
Weed species	----- (# leaves) -----				
IPOLA	N/A	3-4 lf	4 lf	4-5 lf	5 lf
ECHCG	N/A	2-4 lf	3-4 lf	2-5 lf	2-6 lf
SEBEX	N/A	2-4 lf	2-5 lf	2-6 lf	2-8 lf

Conclusions: Clomazone (Command) controlled barnyardgrass greater than 92% with no rice injury. EPOST treatments of triclopyr (Grandstand) at 0.19 and 0.25 lb ai/A did not control hemp sesbania, but provided greater than 95% control of morningglory. MPOST treatments of triclopyr at 0.25 and 0.38 lb ai/A provided less than 74% control of hemp sesbania, but controlled morningglory 75% with 0.25 lb ai/A and 100% with 0.38 lb ai/A. MPOST treatments of triclopyr, pendimethalin (Prowl), and propanil (Stam) provided 100% control of hemp sesbania and morningglory. PREFL and POFL treatments included combinations of pendimethalin, propanil, triclopyr, and bensulfuron (Londax), all of which controlled hemp sesbania and morningglory.

Table 36. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Barnyardgrass (ECHCG)				Pitted morningglory (IPOLA)	
			5/18	5/25	6/8	7/15	6/8	7/15
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Clomazone <i>fb</i> triclopyr	0.5 0.19	PRE EPOST	100	98	99	89	100	100
Clomazone <i>fb</i> triclopyr	0.5 0.25	PRE EPOST	96	98	96	56	98	100
Clomazone <i>fb</i> triclopyr	0.5 0.25	PRE MPOST	100	98	100	61	100	75
Clomazone <i>fb</i> triclopyr	0.5 0.38	PRE MPOST	100	100	100	90	100	100
Clomazone <i>fb</i> triclopyr	0.5 0.25	PRE POFL	97	96	100	80	50	100
Clomazone <i>fb</i> triclopyr	0.5 0.38	PRE POFL	97	98	94	56	33	100
Clomazone <i>fb</i> triclopyr + propanil	0.3 0.19 2.0	PRE POFL	93	93	95	78	25	100
Clomazone <i>fb</i> triclopyr + pendimethalin + propanil	0.3 0.19 1.0 2.0	PRE MPOST	94	95	100	96	100	100
Clomazone <i>fb</i> bensulfuron + propanil <i>fb</i> triclopyr + propanil	0.25 0.04 2.0 0.25 1.0	PRE PREFL POFL	89	90	93	81	0	100
LSD (0.05)			7	6	5	25	41	22

continued

Table 36. Section 2.

Herbicide	Rate (lb/A)	Application timing	Hemp sesbania (SEBEX) control				Rice injury		
			5/18	5/25	6/8	7/15	5/18	5/25	7/15
			----- (%) -----						
Untreated check			0	0	0	0	0	0	0
Clomazone <i>fb</i>	0.5	PRE							
triclopyr	0.19	EPOST	0	5	13	18	4	0	0
Clomazone <i>fb</i>	0.5	PRE							
triclopyr	0.25	EPOST	0	0	13	20	0	0	0
Clomazone <i>fb</i>	0.5	PRE							
triclopyr	0.25	MPOST	0	0	54	31	0	1	0
Clomazone <i>fb</i>	0.5	PRE							
triclopyr	0.38	MPOST	0	0	74	81	6	0	0
Clomazone <i>fb</i>	0.5	PRE							
triclopyr	0.25	POFL	0	0	0	68	0	0	0
Clomazone <i>fb</i>	0.5	PRE							
triclopyr	0.38	POFL	0	0	8	93	1	0	0
Clomazone <i>fb</i>	0.3	PRE							
triclopyr +	0.19								
propanil	2.0	POFL	0	0	0	100	0	0	0
Clomazone <i>fb</i>	0.3	PRE							
triclopyr +	0.19								
pendimethalin +	1.0								
propanil	2.0	MPOST	0	0	100	99	0	0	0
Clomazone <i>fb</i>	0.25	PRE							
bensulfuron +	0.04								
propanil <i>fb</i>	2.0	PREFL							
triclopyr +	0.25								
propanil	1.0	POFL	0	0	20	100	0	0	0
LSD (0.05)			NS	NS	22	28	NS	NS	NS

Table 37. Clomazone (Command) rates on clay soils (PRE), Rohwer, 1999.

TEST INFORMATION	
Location	Rohwer
Planting date	April 23, 1999
Experimental Design / replications	RCB / 4
Harvest date	October 12, 1999
Plot size	5 ft by 35 ft
Crop / Variety	Rice / Lemont
Row width / Number of rows per plot	6 in. / 8 rows
Dates of flushing	April 26, May 4, 11, and 27, 1999
Soil type	clay loam (8% sand, 49% silt, 43% clay)
Date of flooding	June 11, 1999
% OM / pH	3.5 / 6.7

Comments: PRE = preemergence.

Application type	PRE
Date applied	4/23/99
Time	8:00 am
Incorporation equipment	N/A
Air/Soil temperature (F)	75 / 70
Relative humidity (%)	60
Wind (mph)	7
Weather	clear
Soil moisture	optimal
Crop stage/Height	N/A
Sprayer type/mph	BkPkCO ₂ / 3
Nozzle type/Size	Flat fan / 8002
Boom ht / # Noz / Spacing (in.)	22 / 3 / 19
Gpa / Psi	15 / 22

Conclusions: Clomazone (Command) at rates of 1.0 and 1.2 lb ai/A PRE caused up to 50% bleaching of rice 14 days after emergence. However, no yield reduction was noted with any rate tested.

Table 37.

Herbicide	Rate (lb/A)	Application timing	Effect on rice				Yield (lb/A)
			Bleaching		Rice emerged	Stand reduction	
			5/20	6/8	5/20	6/8	
Untreated check			0	0	100	1	2610
Clomazone	0.3	PRE	0	0	100	0	5130
Clomazone	0.4	PRE	1	0	100	3	4680
Clomazone	0.5	PRE	5	0	100	4	5130
Clomazone	0.6	PRE	11	0	100	4	5355
Clomazone	0.8	PRE	13	0	100	3	5355
Clomazone	1.0	PRE	36	0	91	5	5625
Clomazone	1.2	PRE	50	1	96	9	5625
LSD (0.05)			6	NS	NS	NS	1125

Table 38. Clomazone (Command) rates on clay soils (POST), Rohwer, 1999.

TEST INFORMATION

Location	Rohwer	Planting date	April 23, 1999
Experimental Design / replications	RCB / 4	Harvest date	October 12, 1999
Plot size	5 ft by 35 ft	Crop / Variety	Rice / Lemont
Row width / Number of rows per plot	6 in. / 8 rows	Dates of flushing	April 26, May 4, 11, and 27, 1999
Soil type	clay loam (8% sand, 49% silt, 43% clay)	Date of flooding	June 11, 1999
% OM / pH	3.5 / 6.7		

Comments: EPOST = early postemergence.

Application type	EPOST
Date applied	5/17/99
Time	6:45 am
Incorporation equipment	N/A
Air/Soil temperature (F)	70 / 75
Relative humidity (%)	55
Wind (mph)	7
Weather	cloudy
Soil moisture	dry
Crop stage/Height	2-3 lf / 3.5"
Sprayer type/mph	BkPkCO ₂ / 3
Nozzle type/Size	Flat fan / 8002
Boom ht / # Noz / Spacing (in.)	22 / 3 / 19
Gpa / Psi	15 / 22

Conclusions: Clomazone (Command) was applied to rice EPOST at rates that ranged from 0.3 to 1.2 lb ai/A. At the higher rates, bleaching reached levels greater than 35%. Twenty-two days after application bleaching ratings were less than 10%. There were no differences in yields among treatments.

Table 38.

Herbicide	Rate (lb/A)	Application timing	Effect on rice			Yield (lb/A)
			Bleaching		Stand reduction	
			5/20	6/8	6/8	
Untreated check			0	0	0	5670
Clomazone	0.3	EPOST	3	0	0	7560
Clomazone	0.4	EPOST	3	0	0	7560
Clomazone	0.5	EPOST	4	0	0	7425
Clomazone	0.6	EPOST	8	0	0	7740
Clomazone	0.8	EPOST	14	1	0	7650
Clomazone	1.0	EPOST	25	6	0	7695
Clomazone	1.2	EPOST	36	9	0	7560
LSD (0.05)			8	2	NS	990

Table 39. Rice tolerance to postemergence herbicides following clomazone (Command), Rohwer, 1999.**TEST INFORMATION**

Location	Rohwer	Planting date	April 27, 1999
Experimental Design / replications	RCB / 3	Harvest date	N/A
Plot size	5 ft by 35 ft	Crop / Variety	Rice / Lemont
Row width / Number of rows per plot	6 in. / 8 rows	Dates of flushing	June 8, 1999
Soil type	clay loam (8% sand, 49% silt, 43% clay)	Date of flooding	July 7, 1999
% OM / pH	3.5 / 6.7		

Comments: PRE = preemergence; and MPOST = mid postemergence.

Application type	PRE	MPOST
Date applied	5/28/99	6/28/99
Time	10:00 am	7:00 am
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	80 / 80	80 / 81
Relative humidity (%)	40	30
Wind (mph)	3	4
Weather	clear	
Soil moisture	dry	dry
Crop stage/Height	N/A	3-4 lf / 5"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Flat fan / 8002	Flat fan / 8002
Boom ht / # Noz / Spacing (in.)	22 / 3 / 19	22 / 3 / 19
Gpa / Psi	15 / 22	15 / 22

Conclusions: Rice was tolerant to all rates of clomazone PRE and to all POST herbicides.

Table 39.

Herbicide	Rate (lb/A)	Application timing	Effect on rice		
			<u>Bleaching</u>	<u>Stunting</u>	<u>Stand reduction</u>
			7/7	7/7	7/7
			----- (%) -----		
Untreated check			2	0	0
Propanil	4.0	MPOST	2	7	5
(Propanil + molinate)	4.0	MPOST	0	2	2
Clomazone	0.25	PRE	0	3	3
Clomazone <i>fb</i>	0.25	PRE			
propanil	4.0	MPOST	2	7	5
Clomazone <i>fb</i>	0.25	PRE			
(propanil + molinate)	4.0	MPOST	0	3	2
Clomazone	0.5	PRE	2	7	3
Clomazone <i>fb</i>	0.5	PRE			
propanil	4.0	MPOST	3	3	5
Clomazone <i>fb</i>	0.5	PRE			
(propanil + molinate)	4.0	MPOST	5	3	3
Clomazone	0.75	PRE	0	3	2
Clomazone <i>fb</i>	0.75	PRE			
propanil	4.0	MPOST	2	3	3
Clomazone <i>fb</i>	0.75	PRE			
(propanil + molinate)	4.0	MPOST	0	0	0
Clomazone	1.0	PRE	2	8	7
Clomazone <i>fb</i>	1.0	PRE			
propanil	4.0	MPOST	3	7	2
Clomazone <i>fb</i>	1.0	PRE			
(propanil + molinate)	4.0	MPOST	0	0	0
Clomazone	1.5	PRE	2	7	7

continued

Table 39. Continued.

Herbicide	Rate (lb/A)	Application timing	Effect on rice		
			<u>Bleaching</u>	<u>Stunting</u>	<u>Stand reduction</u>
			7/7	7/7	7/7
			----- (%) -----		
Clomazone <i>fb</i>	1.5	PRE			
propanil	4.0	MPOST	2	7	3
Clomazone <i>fb</i>	1.5	PRE			
(propanil + molinate)	4.0	MPOST	0	0	0
Thiobencarb	4.0	MPOST	3	3	2
Carfentrazone	0.03	MPOST	3	8	0
Clomazone <i>fb</i>	0.25	PRE			
thiobencarb	4.0	MPOST	5	10	8
Clomazone <i>fb</i>	0.25	PRE			
carfentrazone	0.03	MPOST	2	8	2
Clomazone <i>fb</i>	0.5	PRE			
thiobencarb	4.0	MPOST	2	5	3
Clomazone <i>fb</i>	0.5	PRE			
carfentrazone	0.03	MPOST	0	5	3
Clomazone <i>fb</i>	0.75	PRE			
thiobencarb	4.0	MPOST	3	5	0
Clomazone <i>fb</i>	0.75	PRE			
carfentrazone	0.03	MPOST	3	7	0
Clomazone <i>fb</i>	1.0	PRE			
thiobencarb	4.0	MPOST	3	5	7
Clomazone <i>fb</i>	1.0	PRE			
carfentrazone	0.03	MPOST	2	12	7
Clomazone <i>fb</i>	1.5	PRE			
thiobencarb	4.0	MPOST	3	7	3
Clomazone <i>fb</i>	1.5	PRE			
carfentrazone	0.03	MPOST	2	7	0
LSD (0.05)			NS	NS	NS

Table 40. Effects of clomazone (Command) on rice under various planting methods, Rohwer, 1999.

TEST INFORMATION

Location	Rohwer	Planting date	May 20, 1999
Experimental Design / replications	RCB / 4	Harvest date	October 12, 1999
Plot size	5 ft by 35 ft	Crop / Variety	Rice / Lemont
Row width / Number of rows per plot	6 in. / 8 rows	Dates of flushing	April 26, May 4, 11, and 27, 1999
Soil type	clay loam (8% sand, 49% silt, 43% clay)	Date of flooding	June 11, 1999
% OM / pH	3.5 / 6.7		

Comments: PRE = preemergence. PPI, PRE, and OPEN PRE treatments were all applied on the same day with the same method of spraying. OPEN PRE indicates that the furrow was not closed after planting to leave seed exposed to herbicide. It also allowed water to carry herbicide into the open furrow during flushing. OPEN PRE was evaluated to determine the effects of clomazone on rice if the furrow was left open and clomazone was taken in directly by the seed.

Application type	PPI, PRE, and OPEN PRE
Date applied	5/20/99
Time	5:00 pm
Incorporation equipment	N/A
Air/Soil temperature (F)	80 / 78
Relative humidity (%)	30
Wind (mph)	6
Weather	clear
Soil moisture	dry
Crop stage/Height	N/A
Sprayer type/mph	BkPkCO ₂ / 3
Nozzle type/Size	Flat fan / 8002
Boom ht / # Noz / Spacing (in.)	22 / 3 / 19
Gpa / Psi	15 / 22

Conclusions: PPI treatments had less than 5% stand reduction until rates reached 1.2 lb ai/A. Bleaching in PPI applications was at acceptable levels until rates reached 0.8 lb ai/A. Average yield in these treatments was 4,702 lb/A. PRE treatments did not affect stand, but the higher rates caused bleaching. Average yield in these treatments was 5,220 lb/A. OPEN PRE treatments reduced rice stand 44 to 77%. Bleaching ranged from 23 to 58%. Clomazone may not have been the reason for the stand reduction although bleaching levels were high. Although the field was flushed often, the open furrow may have caused reduced germination due to excessive drying before the seed could sprout.

Table 40.

Herbicide	Rate (lb/A)	Application timing	Effect on rice		
			Bleaching	Stand reduction	Yield
			6/8/99 ----- (%) -----	6/8/99 ----- (%) -----	10/12 (lb/A)
Untreated check			3	5	3510
Clomazone	0.3	PPI	0	3	4905
Clomazone	0.4	PPI	6	5	5490
Clomazone	0.6	PPI	10	3	4815
Clomazone	0.8	PPI	25	4	4815
Clomazone	1.2	PPI	58	14	4680
Clomazone	0.3	PRE	1	0	5310
Clomazone	0.4	PRE	4	4	5445
Clomazone	0.6	PRE	13	8	5355
Clomazone	0.8	PRE	41	15	4995
Clomazone	1.2	PRE	54	9	4995
Clomazone	0.3	OPEN PRE	4	44	3465
Clomazone	0.4	OPEN PRE	23	65	3465
Clomazone	0.6	OPEN PRE	26	70	2880
Clomazone	0.8	OPEN PRE	50	64	3915
Clomazone	1.2	OPEN PRE	58	78	2700
Untreated check		OPEN PRE	6	65	2295
LSD (0.05)			16	23	1620

Table 41. Propanil for postemergence weed control in combination with clomazone (Command) applied preemergence, Lonoke, 1999.

TEST INFORMATION

Location	Lonoke	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 16, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Wells
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.3 / 5.1		

Comments: PRE = preemergence; and PREFL = pre flood.

	PRE	PREFL
Application type	PRE	PREFL
Date applied	5/11/99	6/10/99
Time	5:00 pm	11:35 am
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	83 / 72	87 / 80
Relative humidity (%)	52	52
Wind (mph)	6	6
Weather	partly cloudy	clear
Soil moisture	dry	moist
Crop stage/Height	N/A	early tillering / 8"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	16 / 6 / 20	22 / 6 / 20
Gpa / Psi	10 / 21	10 / 23
Weed species	----- (# leaves/height) -----	
BRAPP	N/A	4-5 lf / 3"
MOLVE	N/A	flowering / 0.5"
ECHCG	N/A	3-4 lf / 3-4"
IPOLA	N/A	3 lf /

Conclusions: This was an excellent study to show advantages of a combination program. The propanil-only programs did not provide acceptable barnyardgrass control. Clomazone applied alone released rice flatsedge and broadleaf weeds. Combination programs provided excellent control. Combinations of propanil and bispyribac-sodium (Regiment) showed severe antagonism on barnyardgrass.

Table 41. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Broadleaf signalgrass (BRAPP)			Rice flatsedge (CYPIR)		
			5/26	6/15	8/2	6/15	7/12	8/2
			----- (%) -----					
Untreated check			0	0	0	5	0	0
Propanil (Stam)	4.0	PREFL	0	53	21	70	98	71
Propanil (Stam)+ quinclorac	4.0 0.25	PREFL	0	70	100	73	100	100
Propanil (Stam)+ pendimethalin	4.0 1.0	PREFL	0	63	78	70	100	100
Propanil (Stam)+ bispyribac-sodium + Kinetic (0.125%)	4.0 0.019	PREFL	0	58	20	73	100	75
(Propanil + molinate)	6.0	PREFL	0	63	28	73	100	75
Propanil (Super Wham) + Penetrator Plus (1 pt/A)	4.0	PREFL	0	58	51	70	100	100
Clomazone	0.4	PRE	75	95	100	0	18	43
Clomazone <i>fb</i> propanil (Stam)	0.4 4.0	PRE PREFL	76	95	100	75	100	100
Clomazone <i>fb</i> propanil (Stam) + quinclorac	0.4 4.0 0.25	PRE PREFL	78	95	100	78	100	100
Clomazone <i>fb</i> propanil (Stam) + pendimethalin	0.4 4.0 1.0	PRE PREFL	76	95	100	75	100	98
Clomazone <i>fb</i> propanil (Stam) + bispyribac-sodium + Kinetic (0.125%)	0.4 4.0 0.19	PRE PREFL	78	95	100	73	100	100
Clomazone <i>fb</i> (propanil + molinate)	0.4 6.0	PRE PREFL	78	95	100	75	100	96
Clomazone <i>fb</i> propanil (Super Wham) + Penetrator Plus (1 pt/A)	0.4 4.0	PRE PREFL	76	95	100	75	100	100
Propanil (Stam) + quinclorac	4.0 0.125	PREFL	0	60	100	73	100	100
LSD (0.05)			2	7	28	7	12	37

continued

Table 41. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Barnyardgrass (ECHCG)					
			Resistant				Susceptible	
			5/26	6/15	8/2	6/15	7/12	8/2
----- (%) -----								
Untreated check			0	0	0	0	0	0
Propanil (Stam)	4.0	PREFL	0	15	0	0	25	8
Propanil (Stam)+ quinclorac	4.0 0.25	PREFL	0	28	99	94	100	100
Propanil (Stam)+ pendimethalin	4.0 1.0	PREFL	0	23	9	0	73	25
Propanil (Stam)+ bispyribac-sodium + Kinetic (0.125%)	4.0 0.019	PREFL	0	15	0	0	33	10
(Propanil + molinate)	6.0	PREFL		15	20	0	50	5
Propanil (Super Wham) + Penetrator Plus (1 pt/A)	4.0	PREFL	0	23	34	0	48	5
Clomazone	0.4	PRE	76	95	91	85	100	100
Clomazone <i>fb</i> propanil (Stam)	0.4 4.0	PRE PREFL	80	93	93	90	100	100
Clomazone <i>fb</i> propanil (Stam) + quinclorac	0.4 4.0 0.25	PRE PREFL	80	91	100	100	100	100
Clomazone <i>fb</i> propanil (Stam) + pendimethalin	0.4 4.0 1.0	PRE PREFL	80	94	100	10	100	100
Clomazone <i>fb</i> propanil (Stam) + bispyribac-sodium + Kinetic (0.125%)	0.4 4.0 0.19	PRE PREFL	80	91	96	95	100	100
Clomazone <i>fb</i> (propanil + molinate)	0.4 6.0	PRE PREFL	80	95	99	98	100	100
Clomazone <i>fb</i> proprnil (Super Wham) + Penetrator Plus (1 pt/A)	0.4 4.0	PRE PREFL	78	94	99	90	100	100
Propanil (Stam) + quinclorac	4.0 0.125	PREFL	0	30	85	41	100	93
LSD (0.05)			2	9	19	19	23	13

continued

Table 41. Section 3.

Herbicide	Rate (lb/A)	Application timing	Effect on rice		Yield 9/16 (lb/A)
			Injury		
			5/26	8/2	
Untreated check			0	0	5490
Propanil (Stam)	4.0	PREFL	0	0	7155
Propanil (Stam)+ quinclorac	4.0 0.25	PREFL	0	0	7740
Propanil (Stam)+ pendimethalin	4.0 1.0	PREFL	0	0	8010
Propanil (Stam)+ bispyribac-sodium + Kinetic (0.125%)	4.0 0.019	PREFL	0	0	6660
(Propanil + molinate)	6.0	PREFL	0	0	6750
Propanil (Super Wham) + Penetrator Plus (1 pt/A)	4.0	PREFL	0	0	7965
Clomazone	0.4	PRE	18	0	7650
Clomazone <i>fb</i> propanil (Stam)	0.4 4.0	PRE PREFL	16	0	8325
Clomazone <i>fb</i> propanil (Stam) + quinclorac	0.4 4.0 0.25	PRE PREFL	15	0	7920
Clomazone <i>fb</i> propanil (Stam) + pendimethalin	0.4 4.0 1.0	PRE PREFL	21	0	7920
Clomazone <i>fb</i> propanil (Stam) + bispyribac-sodium + Kinetic (0.125%)	0.4 4.0 0.19	PRE PREFL	20	0	8415
Clomazone <i>fb</i> (propanil + molinate)	0.4 6.0	PRE PREFL	25	0	8100
Clomazone <i>fb</i> proprnil (Super Wham) + Penetrator Plus (1 pt/A)	0.4 4.0	PRE PREFL	20	0	7965
Propanil (Stam) + quinclorac	4.0 0.125	PREFL	0	0	8370
LSD (0.05)			6	NS	945

Table 42. Clomazone (Command) levee control, Lonoke, 1999.

TEST INFORMATION

Location	Lonoke	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	10 ft by 20 ft	Crop / Variety	Rice / 93AS3510
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.3 / 5.1		

Comments: PPI = preplant incorporated; PRE = preemergence; PRE-L = additional preemergence on levees; 2-3 LF = 2-3 leaf rice; and PREFL = prefood.

Application type	PPI	PRE	PRE-L	2-3 LF	PREFL
Date applied	5/11/99	5/11/99	5/14/99	6/1/99	6/10/99
Time	9:15 am	4:15 pm	10:05 am	10:30 am	10:00 am
Incorporation equipment	field cultivator	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	72 / 66	85 / 74	69 / 64	73 / 70	82 / 78
Relative humidity (%)	79	51	71	85	73
Wind (mph)	5	6	1.5	7.5	5
Weather	partly cloudy	partly cloudy	partly cloudy	cloudy	clear
Soil moisture	dry	moist	dry	moist	moist
Crop stage/Height	N/A	N/A	N/A	3 lf / 0.5"	1 tiller / 7"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard/110015	Driftguard/110015	Driftguard/110015	Driftguard/110015	Driftguard/110015
Boom ht / # Noz / Spacing (in.)	16 / 6 / 20	16 / 6 / 20	15 / 6 / 20	18 / 6 / 20	19 / 6 / 20
Gpa / Psi	10 / 21	10 / 21	10 / 20	10 / 18	10 / 23
Weed species	----- (# leaves/height) -----				
CYPIR (30/sq ft)	N/A	N/A	N/A	3 lf / 0.5"	5 lf / 3"
MOLVE (23/sq ft)	N/A	N/A	N/A	4 lf	flowering / 0.5"

Conclusions: Follow-up treatments will often be needed for weed control on levees when clomazone (Command) or imazethapyr (Pursuit) are applied prior to levee formation.

Table 42. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Broadleaf signalgrass (BRAPP)						
			6/2 Levee	6/15 Levee Plot		6/29 Levee	7/12 Levee Plot		8/2 Levee
----- (%) -----									
Clomazone	0.4	PRE	0	0	100	0	0	100	0
Clomazone <i>fb</i>	0.4	PRE							
clomazone (spray levee only)	0.2	PRE-L	93	60	80	100	100	100	55
Clomazone <i>fb</i>	0.4	PRE							
propanil <i>fb</i>	4.0	2-3 LF							
propanil (if needed)	4.0	PREFL	0	100	85	100	100	100	80
Clomazone <i>fb</i>	0.4	PRE							
clomazone (spray levee only) <i>fb</i>	0.2	PRE-L							
propanil <i>fb</i>	4.0	2-3 LF							
propanil	4.0	PREFL	88	85	93	100	100	100	65
Clomazone <i>fb</i>	0.4	PRE							
bispyribac-sodium + Kinetic (0.25%)	0.019	PREFL	25	25	100	50	40	100	20
Clomazone <i>fb</i>	0.4	PRE							
propanil + triclopyr	4.0 0.25	PREFL	0	70	100	100	100	100	60
Clomazone <i>fb</i>	0.4	PRE							
propanil + quinclorac	4.0 0.25	2-3 LF	0	100	100	100	100	100	90
Clomazone <i>fb</i>	0.4	PRE							
propanil	4.0	2-3 LF	35	70	88	100	100	100	100
Imazethapyr (levee not treated)	0.094	PPI	0	0	98	0	0	100	0
Imazethapyr <i>fb</i>	0.094	PPI							
imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	25	68	98	100	100	100	70
Imazethapyr <i>fb</i>	0.094	PPI							
imazethapyr + propanil	0.063 4.0	2-3 LF	0	100	100	100	100	100	100
LSD (0.05)			40	27	23	44	35	NS	41

continued

Table 42. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control			
			Rice flatsedge (CYPIR)		Carpetweed (MOLVE)	
			6/15		6/15	
			Levee	Plot	Levee	Plot
			----- (%) -----			
Clomazone	0.4	PRE	0	0	0	0
Clomazone <i>fb</i>	0.4	PRE				
clomazone (spray levee only)	0.2	PRE-L	30	0	0	0
Clomazone <i>fb</i>	0.4	PRE				
propanil <i>fb</i>	4.0	2-3 LF				
propanil (if needed)	4.0	PREFL	100	100	100	100
Clomazone <i>fb</i>	0.4	PRE				
clomazone (spray levee only)	0.2	PRE-L				
<i>fb</i> propanil <i>fb</i>	4.0	2-3 LF				
propanil	4.0	PREFL	100	90	95	88
Clomazone <i>fb</i>	0.4	PRE				
bispyribac-sodium + Kinetic (0.25%)	0.019	PREFL	50	50	50	55
Clomazone <i>fb</i>	0.4	PRE				
propanil + triclopyr	4.0 0.25	PREFL	98	80	88	83
Clomazone <i>fb</i>	0.4	PRE				
propanil + quinclorac	4.0 0.25	2-3 LF	100	100	95	95
Clomazone <i>fb</i>	0.4	PRE				
propanil	4.0	2-3 LF	98	88	88	88
Imazethapyr (levee not treated)	0.094	PPI	0	45	50	0
Imazethapyr <i>fb</i>	0.094	PPI				
imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	100	100	70	63
Imazethapyr <i>fb</i>	0.094	PPI				
imazethapyr + propanil	0.063 4.0	2-3 LF	100	100	100	95
LSD (0.05)			54	65	72	41

continued

Table 42. Section 3.

Herbicide	Rate (lb/A)	Application timing	Rice Injury			
			5/26	6/15		6/26
			Plot	Levee	Plot	Levee
----- (%) -----						
Clomazone	0.4	PRE	7	0	5	0
Clomazone <i>fb</i>	0.4	PRE				
clomazone (spray levee only)	0.2	PRE-L	6	8	5	3
Clomazone <i>fb</i>	0.4	PRE				
propanil <i>fb</i>	4.0	2-3 LF				
propanil (if needed)	4.0	PREFL	6	10	10	25
Clomazone <i>fb</i>	0.4	PRE				
clomazone (spray levee only)	0.2	PRE-L				
<i>fb</i> propanil <i>fb</i>	4.0	2-3 LF				
propanil	4.0	PREFL	4	0	0	10
Clomazone <i>fb</i>	0.4	PRE				
bispyribac-sodium + Kinetic (0.25%)	0.019	PREFL	1	5	5	0
Clomazone <i>fb</i>	0.4	PRE				
propanil + triclopyr	4.0 0.25	PREFL	5	5	10	15
Clomazone <i>fb</i>	0.4	PRE				
propanil + quinclorac	4.0 0.25	2-3 LF	3	0	3	8
Clomazone <i>fb</i>	0.4	PRE				
propanil	4.0	2-3 LF	2	3	0	0
Imazethapyr (levee not treated)	0.094	PPI	2	0	3	0
Imazethapyr <i>fb</i>	0.094	PPI				
imazethapyr + AG-98 (0.25%)	0.063	2-3 LF	3	18	35	25
Imazethapyr <i>fb</i>	0.094	PPI				
imazethapyr + propanil	0.063 4.0	2-3 LF	3	18	25	25
LSD (0.05)			5	10	15	21

Table 43. Clomazone (Command) no-till program, Lonoke, 1999.

TEST INFORMATION

Location	Lonoke	Planting date	May 10, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 20, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Wells
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.3 / 5.1		

Comments: PPL = preplant; and PRE = preemergence. Acifluorfen + bentazon (Storm) was applied postemergence to control sedges and broadleaved weeds.

	PPL	PRE
Application type		
Date applied	4/30/99	5/10/99
Time	9:30 am	2:35 pm
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	67 / 59	88 / 76
Relative humidity (%)	53	31
Wind (mph)	6	5
Weather	clear	clear
Soil moisture	moist	moist
Crop stage/Height	N/A	N/A
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	12 / 6 / 20	16 / 6 / 20
Gpa / Psi	10 / 21	10 / 19
Weed species	-----[# leaves/height(in.)] -----	
BRAPP	N/A	N/A

Conclusions: PPL treatments were applied 10 days prior to planting and PRE treatments were applied immediately after planting into the stale seedbed. The objective was to see if earlier applications would result in inadequate time of residual activity or if the drill disturbance would result in a loss of weed control. Weed pressure in this area was extremely light, and no visible differences were noted.

Table 43. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control					Carpetweed (MOLVE) 6/4
			Broadleaf signalgrass (BRAPP)					
			5/26	6/4	6/15	7/12	8/2	
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Clomazone + glyphosate	0.4 0.75	PPL	93	99	94	100	100	0
Clomazone + glyphosate	0.5 0.75	PPL	93	99	94	100	100	0
Clomazone + paraquat + AG-98 (0.25%)	0.4 0.94	PPL	94	99	94	100	99	0
Clomazone + paraquat + AG-98 (0.25%)	0.5 0.94	PPL	95	99	94	100	100	0
Clomazone + glyphosate	0.4 0.75	PRE	95	99	94	100	99	0
Clomazone + glyphosate	0.5 0.75	PRE	94	99	94	100	95	0
Clomazone + paraquat + AG-98 (0.25%)	0.4 0.94	PRE	95	99	95	100	100	0
Clomazone + paraquat + AG-98 (0.25%)	0.5 0.94	PRE	95	99	93	100	94	0
Quinclorac + glyphosate	0.375 0.75	PRE	95	99	91	98	98	0
LSD (0.05)			3	NS	3	2	5	NS

continued

Table 43. Section 2.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass	Effect on rice			Yield 9/20 (lb/A)
			(ECHCG) control 8/2	Injury			
			-----	(%)	-----		
Untreated check			0	0	0	0	5490
Clomazone + glyphosate	0.4 0.75	PPL	95	10	11	3	7020
Clomazone + glyphosate	0.5 0.75	PPL	100	10	15	0	7875
Clomazone + paraquat + AG-98 (0.25%)	0.4 0.94	PPL	98	11	8	0	6930
Clomazone + paraquat + AG-98 (0.25%)	0.5 0.94	PPL	100	18	14	5	7560
Clomazone + glyphosate	0.4 0.75	PRE	98	20	15	0	7605
Clomazone + glyphosate	0.5 0.75	PRE	100	25	24	13	7830
Clomazone + paraquat + AG-98 (0.25%)	0.4 0.94	PRE	100	18	25	10	7875
Clomazone + paraquat + AG-98 (0.25%)	0.5 0.94	PRE	96	16	23	5	7695
Quinclorac + glyphosate	0.375 0.75	PRE	98	8	8	3	7785
LSD (0.05)			6	4	6	5	1440

Table 44. Clomazone (Command) application techniques, Lonoke, 1999.**TEST INFORMATION**

Location	Lonoke	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 15, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Wells
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.6 / 4.8		

Comments: PPI = preplant incorporated; PPL = preplant (not incorporated); PRE = preemergence.

Application type	PPI	PPL	PRE
Date applied	5/11/99	5/11/99	5/11/99
Time	9:25 am	10:45 am	11:50 am
Incorporation equipment	field cultivator	N/A	N/A
Air/Soil temperature (F)	42 / 66	82 / 70	80 / 69
Relative humidity (%)	79	62	54
Wind (mph)	5	6	9.5
Weather	partly cloudy	partly cloudy	partly cloudy
Soil moisture	dry	moist	moist
Crop stage/Height	N/A	N/A	N/A
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	16 / 6 / 20	16 / 6 / 20	16 / 6 / 20
Gpa / Psi	10 / 21	10 / 21	10 / 21

Conclusions: This study was initiated to help answer some of the questions being asked about clomazone application. Some example questions were "Do I have to roll?", "Can I drill, spray, and roll or do I have to drill, roll, and spray?", "Can I apply Command in front of the drill?" In this study, clomazone was sprayed and incorporated, planted, and either rolled or not rolled; planted, sprayed, and rolled versus planted, rolled, and sprayed versus planted, sprayed, and not rolled; sprayed on the surface, planted and then either rolled not rolled. The preplant incorporated treatments resulted in the highest visible injury but had some of the highest yields. The plant, roll, and spray treatment resulted in somewhat less injury and high yields. All treatments resulted in excellent grass control.

Table 44. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control				
			Rice flatsedge (CYPIR)	Barnyardgrass (ECHCG)		Eclipta (ECLAL)	Carpetweed (MOLVE)
			6/4	7/12	8/2	6/4	6/4
			----- (%) -----				
Acifluorfen + bentazon (Storm) at 1.5 pt/A + AG-98 (0.25%) was applied 4 June to all plots for broadleaf weed control:							
Check			0	0	0	0	0
Clomazone, then plant and roll	0.4	PPI	0	100	100	95	0
Clomazone, then plant	0.4	PPI	0	100	100	95	0
Plant and roll <i>fb</i> clomazone	0.4	PRE	0	100	100	100	0
Plant <i>fb</i> clomazone, then roll	0.4	PRE	0	100	100	100	0
Plant <i>fb</i> clomazone	0.4	PRE	0	100	99	100	0
Clomazone, then plant and roll	0.4	PPL	0	100	100	100	0
Clomazone, then plant	0.4	PPL	0	99	98	100	0
LSD (0.05)			NS	1	3	6	NS

continued

Table 44. Section 2.

Herbicide	Rate (lb/A)	Application timing	Broadleaf signalgrass (BRAPP) control				
			5/26	6/4	6/15	7/12	8/2
			----- (%) -----				
Acifluorfen + bentazon (Storm) at 1.5 pt/A + AG-98 (0.25%) was applied 4 June to all plots for broadleaf weed control:							
Check			0	0	0	0	0
Clomazone, then plant and roll	0.4	PPI	95	99	93	100	100
Clomazone, then plant	0.4	PPI	100	99	94	100	100
Plant and roll <i>fb</i> clomazone	0.4	PRE	96	99	91	100	100
Plant <i>fb</i> clomazone, then roll	0.4	PRE	99	99	93	100	100
Plant <i>fb</i> clomazone	0.4	PRE	100	99	93	100	100
Clomazone, then plant and roll	0.4	PPL	96	99	93	100	100
Clomazone, then plant	0.4	PPL	100	99	90	100	96
LSD (0.05)			5	1	4	1	3

continued

Table 44. Section 3.

Herbicide	Rate (lb/A)	Application timing	Hemp sesbania	Effect on rice			Yield 9/15 (lb/A)
			(SEBEX) control 8/2	Injury			
				5/26	6/4	6/15	
			-----	(%)	-----		
Acifluorfen + bentazon (Storm) at 1.5 pt/A + AG-98 (0.25%) was applied 4 June to all plots for broadleaf weed control:							
Check			0	0	0	0	6795
Clomazone, then plant and roll	0.4	PPI	100	39	34	26	8865
Clomazone, then plant	0.4	PPI	99	35	40	23	8415
Plant and roll <i>fb</i> clomazone	0.4	PRE	98	28	19	0	8685
Plant <i>fb</i> clomazone, then roll	0.4	PRE	100	25	28	5	7290
Plant <i>fb</i> clomazone	0.4	PRE	98	33	30	5	8460
Clomazone, then plant and roll	0.4	PPL	100	34	30	13	8415
Clomazone, then plant	0.4	PPL	100	23	25	19	8415
LSD (0.05)			3	11	4	10	1575

Table 45. Evaluation of bispyribac-sodium (Regiment) in herbicide programs in rice, Stuttgart, 1999.

TEST INFORMATION

Location	Stuttgart	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 16, 1999
Plot size	6 ft by 16 ft	Crop / Variety	Rice / Drew (+ Vitavax + Icon)
Row width / Number of rows per plot	6.5 in. / 9 rows	Dates of flushing	May 16, 25, and June 9, 1999
Soil type	Dewitt silt loam (8% sand, 75% silt, 16% clay)	Date of flooding	June 21, 1999
% OM / pH	1 / 5.4		

Comments: PRE = preemergence; DPRE = delayed preemergence; EPOST = early postemergence; MPOST = mid-postemergence; PREFL = pre-flood; and POFL = post-flood. Yield is adjusted to 12% moisture.

Application type	PRE	DPRE	EPOST	MPOST	PREFL	POFL
Date applied	5/12/99	5/18/99	6/2/99	6/8/99	6/18/99	6/30/99
Time	8:00 am	7:30 pm	7:00 am	11:00 am	6:00 am	9:30 am
Incorporation equipment	N/A	N/A	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	78 / 76	70 / 75	71 / 72	89 / 100	69 / 70	78 / 82
Relative humidity (%)	62	72	90	65	66	89
Wind (mph)	1	2	2	2	5	1
Weather	mostly clear	clear	cloudy	clear	clear	N/A
Soil moisture	moist	moist	wet	moist	moist	moist
Crop stage/Height	N/A	N/A	2-3 lf / 6"	3-4 f / 7" 10"	4-7 lf, 2 tiller / 19"	8-9 lf, 2 tiller /
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Turbo TJ / 110015	Turbo TJ / 110015	Teejet XR / 11001 VS	Teejet XR / 11001 VS	Teejet XR / 11001 VS	Teejet XR / 11001 VS
Boom ht / # Noz / Spacing (in.)	15 / 3 / 18	15 / 3 / 18	14 / 3 / 18	15 / 3 / 18	14 / 3 / 18	14 / 3 / 18
Gpa / Psi	10 / 21	10 / 22	10 / 41	10 / 42	10 / 42	10 / 41
Weed species (density)	----- [# leaves/height (in.)] -----					
R-ECHCG (27/row ft)	N/A	N/A	2-3 lf / 0.5-1"	3 lf / 2-3"	4-7 lf, 2 tiller / 8-10"	9-11 lf, 3 tiller / 25-27"
ECHCG (27/row ft)	N/A	N/A	2 lf / 0.5-0.75"	2-3 lf / 2"	4-6 lf, 2 tiller / 6-8"	8-10 lf / 2 tiller / 19-22"
BRAPP (7/ft ²)	N/A	N/A	3 lf / 3.5"	4-5 lf, 1 tiller / 4-5"	5-8 lf, 3 tiller / 3-7"	N/A
IPOWR (6/row ft)	N/A	N/A	2-3 lf / 2-3"	3-4 lf / 3-4"	8-10 lf / 4-5"	6-8 lf / 9-11"
IPOLA (20/row ft)	N/A	N/A	2-3 lf / 2-4"	3-5 lf / 3-5"	8-10 lf / 8-12"	15-18 lf / 12-15"
SEBEX 27/row ft)	N/A	N/A	3-4 lf / 2.5-3"	4-6 lf / 4-6"	6-8 lf / 8-10"	8-10 lf / 17-20"
AESVI (13/row ft)	N/A	N/A	cot.-1 lf / 0.5-0.75"	2-3 lf / 1-1.5"	4-5 lf / 3-4"	6-8 lf / 9-11"

Conclusions: Bispyribac-sodium is an excellent alternative for control of propanil-resistant or -susceptible barnyardgrass, and can control other grasses when used in herbicide programs with clomazone, pendimethalin, and thiobencarb. It also controls other problem weeds common to rice culture such as hemp sesbania and northern jointvetch. The wide application window for barnyardgrass control gives producers salvage options if early-season failures occur.

Table 45. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control							Large crabgrass (DIGSA) 6/17	
			Barnyardgrass								
			Res. (R-ECHCG)			Susc. (ECHCG)					
			6/17	6/24	6/29	6/17	6/24	6/29	7/28		
Untreated check			0	0	0	0	0	0	0	0	
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i>	0.02	MPOST									
triclopyr + Agri-Dex (1%)	0.28	POFL	83	86	88	85	84	92	96	95	
(Propanil + molinate) <i>fb</i>	4.5	MPOST									
triclopyr + Agri-Dex (1%)	0.28	POFL	51	63	53	84	81	83	89	99	
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i>	0.02	MPOST									
bispyribac-sodium + Kinetic (0.125%)	0.02	PREFL	78	90	89	83	92	91	95	77	
Propanil (Stam M4) <i>fb</i>	3.0	EPOST									
(propanil + molinate)	4.5	PREFL	29	36	38	86	86	90	93	99	
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i>	0.02	MPOST									
bispyribac-sodium + Kinetic (0.125%)	0.026	POFL	81	85	84	86	88	94	97	95	
(Propanil + molinate) <i>fb</i>	4.5	MPOST									
molinate + bensulfuron + Agri-Dex (1%)	3.0 0.038	POFL	55	76	76	89	86	95	89	100	
Pendimethalin <i>fb</i>	1.0	DPRE									
bispyribac-sodium + Kinetic (0.125%)	0.018	MPOST	99	100	96	99	100	96	95	100	
Pendimethalin <i>fb</i>	1.0	DPRE									
bispyribac-sodium + Kinetic (0.125%)	0.02	MPOST	96	98	93	99	100	93	94	100	
Pendimethalin <i>fb</i>	1.0	DPRE									
(propanil + molinate)	4.5	MPOST	96	99	97	99	100	97	89	100	
Clomazone <i>fb</i>	0.3	PRE									
bispyribac-sodium + Kinetic (0.125%)	0.02	PREFL	98	100	94	98	100	95	94	99	
Clomazone <i>fb</i>	0.3	PRE									
bispyribac-sodium + Kinetic (0.125%)	0.02	POFL	99	100	97	99	100	94	96	100	

continued

Table 45. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control							Large crabgrass (DIGSA) 6/17	
			Barnyardgrass								
			Res. (R-ECHCG)			Susc. (ECHCG)					
			6/17	6/24	6/29	6/17	6/24	6/29	7/28		
			----- (%) -----								
Clomazone <i>fb</i> (propanil + molinate)	0.3 4.5	PRE PREFL	99	100	97	99	100	97	99	100	
Clomazone <i>fb</i> molinate + bensulfuron + Agri-Dex (1%)	0.3 3.0 0.038	PRE POFL	99	100	97	99	100	97	98	100	
Thiobencarb <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	3.0 0.02	DPRE MPOST	98	100	88	99	95	89	96	100	
Thiobencarb <i>fb</i> (propanil + molinate)	3.0 4.5	DPRE MPOST	95	100	93	96	100	93	95	100	
Pendimethalin <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	1.0 0.02	DPRE POFL	97	99	98	98	99	97	95	100	
Pendimethalin <i>fb</i> molinate	1.0 3.0	DPRE POFL	99	100	94	99	96	95	94	99	
Pendimethalin <i>fb</i> bispyribac-sodium + triclopyr + Kinetic (0.125%)	1.0 0.02 0.28	DPRE POFL	99	99	95	99	99	95	93	99	
Pendimethalin <i>fb</i> molinate + triclopyr + Agri-Dex (1%)	1.0 3.0 0.28	DPRE POFL	99	100	97	99	99	97	92	99	
Thiobencarb <i>fb</i> cyhalofop-butyl + Agri-Dex (1%) <i>fb</i> bispyribac-sodium + triclopyr + Kinetic (0.125%)	3.0 0.125 0.02 0.19	DPRE EPOST POFL	99	100	97	99	100	97	98	100	
LSD (0.05)			10	8	9	6	8	6	6	10	

continued

Table 45. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Broadleaf signalgrass (BRAPP)				Hemp sesbania (SEBEX)			
			6/17	6/24	6/29	7/28	6/17	6/24	6/29	7/28
Untreated check			0	0	0	0	0	0	0	0
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i> triclopyr + Agri-Dex (1%) (Propanil + molinate) <i>fb</i> triclopyr + Agri-Dex (1%)	0.02 0.28 4.5 0.28	MPOST POFL MPOST POFL	15	48	56	56	45	75	87	96
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i> bispyribac-sodium + Kinetic (0.125%) Propanil (Stam M4) <i>fb</i> (propanil + molinate)	0.02 0.02 3.0 4.5	MPOST PREFL EPOST PREFL	95	100	95	96	94	100	96	92
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i> bispyribac-sodium + Kinetic (0.125%) (Propanil + molinate) <i>fb</i> molinate + bensulfuron + Agri-Dex (1%)	0.02 0.026 4.5 3.0 0.038	MPOST POFL MPOST POFL	24	69	78	86	46	70	86	94
Pendimethalin <i>fb</i> bispyribac-sodium + Kinetic (0.125%) Pendimethalin <i>fb</i> bispyribac-sodium + Kinetic (0.125%) Pendimethalin <i>fb</i> (propanil + molinate)	1.0 0.018 1.0 0.02 1.0 4.5	DPRE MPOST DPRE MPOST DPRE MPOST	93	93	91	89	61	76	76	77
Clomazone <i>fb</i> bispyribac-sodium + Kinetic (0.125%) Clomazone <i>fb</i> bispyribac-sodium + Kinetic (0.125%) Clomazone <i>fb</i> (propanil + molinate)	0.3 0.02 0.3 0.02 0.3 4.5	PRE PREFL PRE POFL PRE PREFL	99	100	95	96	21	45	64	84
			99	100	97	96	15	15	0	86
			99	100	95	97	13	89	97	96

continued

Table 45. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Broadleaf signalgrass (BRAPP)				Hemp sesbania (SEBEX)			
			6/17	6/24	6/29	7/28	6/17	6/24	6/29	7/28
			----- (%) -----							
Clomazone <i>fb</i>	0.3	PRE								
molinate +	3.0									
bensulfuron +	0.038									
Agri-Dex (1%)		POFL	98	96	94	98	9	10	0	65
Thiobencarb <i>fb</i>	3.0	DPRE								
bispyribac-sodium +	0.02									
Kinetic (0.125%)		MPOST	74	66	53	40	53	81	75	84
Thiobencarb <i>fb</i>	3.0	DPRE								
(propanil + molinate)	4.5	MPOST	85	90	95	77	96	99	95	83
Pendimethalin <i>fb</i>	1.0	DPRE								
bispyribac-sodium +	0.02									
Kinetic (0.125%)		POFL	94	94	98	83	26	20	5	86
Pendimethalin <i>fb</i>	1.0	DPRE								
molinate	3.0	POFL	94	95	95	86	21	18	10	0
Pendimethalin <i>fb</i>	1.0	DPRE								
bispyribac-sodium +	0.02									
triclopyr +	0.28									
Kinetic (0.125%)		POFL	91	86	85	88	26	15	14	94
Pendimethalin <i>fb</i>	1.0	DPRE								
molinate +	3.0									
triclopyr +	0.28									
Agri-Dex (1%)		POFL	88	85	86	84	14	15	23	90
Thiobencarb <i>fb</i>	3.0	DPRE								
cyhalofop-butyl +	0.125									
Agri-Dex (1%) <i>fb</i>		EPOST								
bispyribac-sodium +	0.02									
triclopyr +	0.19									
Kinetic (0.125%)		POFL	98	96	97	94	23	20	5	95
LSD (0.05)			14	16	16	14	13	10	19	9

continued

Table 45. Section 3.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Northern jointvetch (AESVI)				Pitted morningglory (IPOLA)			
			6/17	6/24	6/29	7/28	6/17	6/24	6/29	7/28
			----- (%) -----							
Untreated check			0	0	0	0	0	0	0	0
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i> triclopyr + Agri-Dex (1%) (Propanil + molinate) <i>fb</i> triclopyr + Agri-Dex (1%)	0.02 0.28 4.5 0.28	MPOST POFL MPOST POFL	83	82	73	91	41	48	60	92
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i> bispyribac-sodium + Kinetic (0.125%) Propanil (Stam M4) <i>fb</i> (propanil + molinate)	0.02 0.02 3.0 4.5	MPOST PREFL EPOST PREFL	77	98	94	87	26	35	46	23
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i> bispyribac-sodium + Kinetic (0.125%) (Propanil + molinate) <i>fb</i> molinate + bensulfuron + Agri-Dex (1%)	0.02 0.026 4.5 3.0 0.038	MPOST POFL MPOST POFL	93	70	62	92	31	33	35	79
Pendimethalin <i>fb</i> bispyribac-sodium + Kinetic (0.125%) Pendimethalin <i>fb</i> bispyribac-sodium + Kinetic (0.125%) Pendimethalin <i>fb</i> (propanil + molinate)	1.0 0.018 1.0 0.02 1.0 4.5	DPRE MPOST DPRE MPOST DPRE MPOST	88	88	78	90	29	33	51	38
Clomazone <i>fb</i> bispyribac-sodium + Kinetic (0.125%) Clomazone <i>fb</i> bispyribac-sodium + Kinetic (0.125%) Clomazone <i>fb</i> (propanil + molinate)	0.3 0.02 0.3 0.02 0.3 4.5	PRE PREFL PRE POFL PRE PREFL	23	93	87	95	18	39	36	23

continued

Table 45. Section 3. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Northern jointvetch (AESVI)				Pitted morningglory (IPOLA)			
			6/17	6/24	6/29	7/28	6/17	6/24	6/29	7/28
			----- (%) -----							
Untreated check			0	0	0	0	0	0	0	0
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i>	0.02	MPOST								
triclopyr + Agri-Dex (1%)	0.28	POFL	83	82	73	91	41	48	60	92
Clomazone <i>fb</i>	0.3	PRE								
molinatate + bensulfuron + Agri-Dex (1%)	3.0 0.038	POFL	17	27	0	77	25	20	46	85
Thiobencarb <i>fb</i>	3.0	DPRE								
bispyribac-sodium + Kinetic (0.125%)	0.02	MPOST	80	78	73	80	51	55	64	18
Thiobencarb <i>fb</i>	3.0	DPRE								
(propanil + molinatate)	4.5	MPOST	87	82	93	73	31	50	60	10
Pendimethalin <i>fb</i>	1.0	DPRE								
bispyribac-sodium + Kinetic (0.125%)	0.02	POFL	17	10	18	90	28	33	40	21
Pendimethalin <i>fb</i>	1.0	DPRE								
molinatate	3.0	POFL	18	27	18	0	26	15	29	0
Pendimethalin <i>fb</i>	1.0	DPRE								
bispyribac-sodium + triclopyr + Kinetic (0.125%)	0.02 0.28	POFL	15	17	20	92	15	15	30	91
Pendimethalin <i>fb</i>	1.0	DPRE								
molinatate + triclopyr + Agri-Dex (1%)	3.0 0.28	POFL	17	20	15	90	24	20	44	86
Thiobencarb <i>fb</i>	3.0	DPRE								
cyhalofop-butyl + Agri-Dex (1%) <i>fb</i>	0.125	EPOST								
bispyribac-sodium + triclopyr + Kinetic (0.125%)	0.02 0.19	POFL	10	17	0	90	20	20	29	91
LSD (0.05)			20	16	24	9	16	19	21	15

continued

Table 45. Section 4.

Herbicide	Rate (lb/A)	Application timing	Palmleaf morningglory (IPOWR) control				Effect on rice				Yield 9/16 (lb/A)
			6/17	6/24	6/29	7/28	Injury				
			----- (%) -----				6/17	6/24	6/29	7/28	
Untreated check			0	0	0	0	0	0	0	0	4407
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i> triclopyr + Agri-Dex (1%)	0.02 0.28	MPOST POFL									
(Propanil + molinate) <i>fb</i> triclopyr + Agri-Dex (1%)	4.5 0.28	MPOST POFL	68	28	41	91	0	8	4	0	6432
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	0.02 0.02	MPOST PREFL									
Propanil (Stam M4) <i>fb</i> (propanil + molinate)	3.0 4.5	EPOST PREFL									
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	0.02 0.026	MPOST POFL	53	23	34	40	0	5	3	0	6553
(Propanil + molinate) <i>fb</i> molinate + bensulfuron + Agri-Dex (1%)	4.5 3.0 0.038	MPOST POFL	33	18	34	81	0	0	0	0	7028
Pendimethalin <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	1.0 0.018	DPRE MPOST	55	24	33	30	0	6	14	0	6451
Pendimethalin <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	1.0 0.02	DPRE MPOST	45	35	44	38	0	15	18	0	6848
Pendimethalin <i>fb</i> (propanil + molinate)	1.0 4.5	DPRE MPOST	35	24	26	34	0	3	0	0	6469
Clomazone <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	0.3 0.02	PRE PREFL	51	31	36	23	0	5	3	0	6394
Clomazone <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	0.3 0.02	PRE POFL	44	0	0	18	0	0	0	0	7430
Clomazone <i>fb</i> (propanil + molinate)	0.3 4.5	PRE PREFL	38	33	33	30	0	4	8	0	6904

continued

Table 45. Section 4. Continued.

Herbicide	Rate (lb/A)	Application timing	Palmleaf morningglory (IPOWR) control				Effect on rice				Yield 9/16 (lb/A)
			6/17	6/24	6/29	7/28	Injury				
			----- (%) -----				6/17	6/24	6/29	7/28	
Untreated check			0	0	0	0	0	0	0	0	4407
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i> triclopyr + Agri-Dex (1%)	0.02 0.28	MPOST POFL									
Clomazone <i>fb</i> molinate + bensulfuron + Agri-Dex (1%)	0.3 3.0 0.038	PRE POFL	68	28	41	91	0	8	4	0	6432
Thiobencarb <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	3.0 0.02	DPRE MPOST	25	0	0	79	0	5	0	0	6810
Thiobencarb <i>fb</i> (propanil + molinate)	3.0 4.5	DPRE MPOST	65	8	13	13	0	6	9	0	5714
Pendimethalin <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	1.0 0.02	DPRE POFL	38	23	36	8	0	3	5	0	6716
Pendimethalin <i>fb</i> molinate	1.0 3.0	DPRE POFL	48	11	8	15	0	3	4	0	7122
Pendimethalin <i>fb</i> bispyribac-sodium + triclopyr + Kinetic (0.125%)	1.0 0.02 0.28	DPRE POFL	15	5	5	0	0	1	3	0	6515
Pendimethalin <i>fb</i> molinate + triclopyr + Agri-Dex (1%)	1.0 3.0 0.28	DPRE POFL	18	18	15	91	0	0	0	0	6772
Thiobencarb <i>fb</i> cyhalofop-butyl + Agri-Dex (1%) <i>fb</i> bispyribac-sodium + triclopyr + Kinetic (0.125%)	3.0 0.125 0.02 0.19	DPRE EPOST POFL	34	13	5	83	0	5	4	0	6389
LSD (0.05)			23	18	22	18	NS	5	6	NS	649

Table 46. Evaluation of bispyribac-sodium (Regiment) for rice weed control, Rohwer, 1999.**TEST INFORMATION**

Location	Rohwer	Planting date	April 22, 1999
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	5 ft by 17 ft	Crop / Variety	Rice / Lemont
Row width / Number of rows per plot	6 in. / 8 rows	Dates of flushing	April 26, May 5, 1, and 27, 1999
Soil type	clay loam (8% sand, 49% silt, 43% clay)	Date of flooding	June 20, 1999
% OM / pH	3.5 / 6.7		

Comments: PRE = preemergence; DPRE = delayed preemergence; EPOST = early postemergence; MPOST = mid postemergence, PREFL = pre-flood; and POFL = postflood.

Application type	PRE	DPRE	EPOST	MPOST	PREFL	POFL
Date applied	4/23/99	5/4/99	5/17/99	5/26/99	6/9/99	6/21/99
Time	8:00 am	7:30 am	8:00 am	8:00 am	8:00 am	8:15 am
Incorporation equipment	N/A	N/A	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	69 / 52	73 / 71	77 / 78	70 / 70	80 / 88	87 / 71
Relative humidity (%)	20	30	30	40	30	52
Wind (mph)	3	6	7	4	3	4.5
Weather	clear	cloudy	partly cloudy	cloudy	clear	
Soil moisture	dry	dry	dry	dry	dry	flood
Crop stage/Height	N/A	N/A	2-3 lf / 3"	3-4 lf / 6"	4-5 lf / 8"	5-6 lf / 12"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Flat fan / 8002	Flat fan / 8002	Flat fan / 8002	Flat fan / 8002	Flat fan / 8002	Flat fan / 8002
Boom ht / # Noz / Spacing (in.)	22 / 3 / 19	22 / 3 / 19	22 / 3 / 19	22 / 3 / 19	22 / 3 / 19	22 / 3 / 19
Gpa / Psi	15 / 22	15 / 22	15 / 22	15 / 23	15 / 25	15 / 22
Weed species	----- (# leaves) -----					
ECHCG	N/A	N/A	2-3 lf	2-5 lf	2-5 lf	2-6 lf
IPOLA	N/A	N/A	2 lf	2-4 lf	6-8"	12"
SEBEX	N/A	N/A	2-3"	2-4"	2-12"	4-18"

Conclusions: An extremely high barnyardgrass population seemed to break through almost all herbicide treatments. Good late-season control was provided by sequential applications of bispyribac-sodium (Regiment), 0.02 lb ai/A PREFL and POFL. Nearly acceptable late-season control was provided by clomazone (Command) PRE *fb* bispyribac-sodium POFL, pendimethalin DPRE *fb* propanil + molinate MPOST, and pendimethalin DPRE *fb* bispyribac-sodium MPOST.

Table 46. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control				
			Hemp sesbania (SEBEX)			Pitted morningglory (IPOLA)	
			5/18	5/25	7/19	5/25	7/19
			----- (%) -----				
Untreated check			0	0	0	0	0
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i>	0.02	MPOST					
triclopyr	0.28	POFL	0	0	98	0	100
(Propanil + molinate) <i>fb</i>	4.5	MPOST					
triclopyr	0.28	POFL	0	0	98	0	100
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i>	0.02	MPOST					
bispyribac-sodium + Kinetic (0.125%)	0.022	PREFL	0	0	100	38	93
Propanil <i>fb</i>	3.0	EPOST					
(propanil + molinate)	4.0	PREFL	0	75	99	0	99
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i>	0.02	PREFL					
bispyribac-sodium + Kinetic (0.125%)	0.026	POFL	0	0	100	0	71
(Propanil + molinate) <i>fb</i>	4.5	PREFL					
molinate + bensulfuron	3.0 0.0375	POFL	0	0	100	0	99
Pendimethalin <i>fb</i>	1.0	DPRE					
bispyribac-sodium + Kinetic (0.125%)	0.017	MPOST	18	6	30	0	98
Pendimethalin <i>fb</i>	1.0	DPRE					
bispyribac-sodium + Kinetic (0.125%)	0.02	MPOST	8	0	31	5	87
Pendimethalin <i>fb</i>	1.0	DPRE					
(propanil + molinate)	4.5	MPOST	10	8	96	15	99
Clomazone <i>fb</i>	0.3	PRE					
bispyribac-sodium + Kinetic (0.125%)	0.02	PREFL	8	8	93	0	65
Clomazone <i>fb</i>	0.3	PRE					
bispyribac-sodium + Kinetic (0.125%)	0.02	POFL	8	25	98	13	49
Clomazone <i>fb</i>	0.3	PRE					
(propanil + molinate)	4.5	POFL	0	0	100	0	78
Clomazone <i>fb</i>	0.3	PRE					
molinate + bensulfuron	3.0 0.375	POFL	0	0	75	0	98

continued

Table 46. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control				
			Hemp sesbania (SEBEX)			Pitted morningglory (IPOLA)	
			5/18	5/25	7/19	5/25	7/19
			----- (%) -----				
Thiobencarb <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	3.0 0.02	DPRE MPOST	0	0	99	0	96
Thiobencarb <i>fb</i> (propanil + molinate)	3.0 4.5	DPRE MPOST	8	0	96	0	99
Pendimethalin <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	1.0 0.02	DPRE POFL	8	0	94	0	71
Pendimethalin <i>fb</i> molinate	1.0 3.0	DPRE POFL	13	0	83	8	86
Pendimethalin <i>fb</i> bispyribac-sodium + triclopyr + Kinetic (0.125%)	1.0 0.02 0.28	DPRE POFL	19	0	100	0	100
Pendimethalin <i>fb</i> molinate + triclopyr	1.0 3.0 0.28	DPRE POFL	20	0	93	0	99
LSD (0.05)			17	24	26	19	29

continued

Table 46. Section 2.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass (ECHCG) control				Rice injury	
			5/25	6/7	7/8	8/30	5/25	6/7
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i> triclopyr	0.02 0.28	MPOST POFL	0	0	0	15	0	0
(Propanil + molinate) <i>fb</i> triclopyr	4.5 0.28	MPOST POFL	0	0	17	54	0	0
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	0.02 0.022	MPOST PREFL	0	0	38	76	0	0
Propanil <i>fb</i> (propanil + molinate)	3.0 4.0	EPOST PREFL	0	33	013	33	0	0

continued

Herbicide Evaluation in Arkansas Rice, 1999

Table 46. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass (ECHCG) control				Rice injury	
			5/25	6/7	7/8	8/30	5/25	6/7
			----- (%) -----					
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i>	0.02	PREFL						
bispyribac-sodium + Kinetic (0.125%) (Propanil + molinate) <i>fb</i>	0.026	POFL	0	0	65	93	0	0
molinate + bensulfuron	4.5 3.0 0.0375	PREFL POFL	0	0	0	29	0	0
Pendimethalin <i>fb</i>	1.0	DPRE						
bispyribac-sodium + Kinetic (0.125%)	0.017	MPOST	93	76	71	83	3	0
Pendimethalin <i>fb</i>	1.0	DPRE						
bispyribac-sodium + Kinetic (0.125%)	0.02	MPOST	95	78	55	78	0	0
Pendimethalin <i>fb</i>	1.0	DPRE						
(propanil + molinate)	4.5	MPOST	90	81	48	84	1	0
Clomazone <i>fb</i>	0.3	PRE						
bispyribac-sodium + Kinetic (0.125%)	0.02	PREFL	76	63	50	86	1	0
Clomazone <i>fb</i>	0.3	PRE						
bispyribac-sodium + Kinetic (0.125%)	0.02	POFL	74	54	38	27	0	0
Clomazone <i>fb</i>	0.3	PRE						
(propanil + molinate)	4.5	POFL	76	59	0	18	0	0
Clomazone <i>fb</i>	0.3	PRE						
molinate + bensulfuron	3.0 0.375	POFL	80	68	0	8	1	0
Thiobencarb <i>fb</i>	3.0	DPRE						
bispyribac-sodium + Kinetic (0.125%)	0.02	MPOST	34	8	0	23	0	0
Thiobencarb <i>fb</i>	3.0	DPRE						
(propanil + molinate)	4.5	MPOST	91	70	43	76	0	0
Pendimethalin <i>fb</i>	1.0	DPRE						
bispyribac-sodium + Kinetic (0.125%)	0.02	POFL	95	63	31	29	0	0
Pendimethalin <i>fb</i>	1.0	DPRE						
molinate	3.0	POFL	95	69	10	8	5	0
Pendimethalin <i>fb</i>	1.0	DPRE						
bispyribac-sodium + triclopyr + Kinetic (0.125%)	0.02 0.28	POFL	95	69	15	23	0	0
Pendimethalin <i>fb</i>	1.0	DPRE						
molinate + triclopyr	3.0 0.28	POFL	95	65	13	41	3	0
LSD (0.05)			10	22	26	28	3	NS

Table 47. Bispyribac-sodium (Regiment) in weed control programs, Lonoke, 1999.**TEST INFORMATION**

Location	Lonoke	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 8, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Bengal
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.3 / 5.1		

Comments: PRE = preemergence; DPRE = delayed preemergence; 2-3 LF = 2-3 leaf rice; 4-5 LF = 4-5 leaf rice; PREFL = pre-flood; and POFL = postflood.

Application type	PRE	DPRE	2-3 LF	4-5 LF	PREFL	POFL
Date applied	5/11/99	5/17/99	6/2/99	6/4/99	6/10/99	6/21/99
Time	5:00 pm	5:15 pm	8:40 am	4:00 pm	11:10 AM	3:30 PM
Incorporation equipment	N/A	N/A	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	83 / 72	83 / 76	72 / 68	92 / 86	87 / 80	93 / 80
Relative humidity (%)	52	64	78	45	52	32
Wind (mph)	6	6	0	5	3	3
Weather	partly cloudy	cloudy	cloudy	partly cloudy	clear	clear
Soil moisture	dry	saturated	saturated	dry	moist	flooded
Crop stage/Height	N/A	spike / 0.25"	4 lf / 7"	4 lf / 8"	4 lf / 8"	2-3 tiller / 15"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type	Driftguard /	Driftguard /	Driftguard /	Driftguard /	Driftguard /	Driftguard /
/Size	110015	110015	110015	110015	110015	110015
Boom ht / # Noz /						
Spacing (in.)	16 / 6 / 20	16 / 6 / 20	18 / 6 / 20	20 / 6 / 20	10 / 6 / 20	25 / 6 / 20
Gpa / Psi	10 / 21	10 / 23	10 / 18	10 / 21	10 / 23	10 / 21
Weed species	----- [# leaves/height (in.)] -----					
ECHCG	N/A	N/A	3 lf / 2.5"	3 lf / 4"	3-4 lf / 3"	2 tiller / 10"
BRAPP	N/A	N/A	2 lf / 1.5"	3 lf / 2.5"	4 lf / 3"	N/A
CYPIR	N/A	N/A	3 lf / 1"	4 lf / 3"	N/A	4-5 lf / 6"
MOLVE	N/A	N/A	4 lf	4 lf	N/A	N/A
AESVI	N/A	N/A	N/A	3 lf / 2"	N/A	N/A
IPOLA	N/A	N/A	N/A	2 lf / 2"	N/A	N/A
SEBEX	N/A	N/A	N/A	N/A	N/A	6 lf / 10"

Conclusions: Bispyribac-sodium (Regiment) treatments provided excellent barnyardgrass, rice flatsedge, and hemp sesbania control. A program with other herbicides is needed for broadleaf signalgrass and Amazon sprangletop control.

Table 47. Section 1.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass (ECHCG) control				
			Resistant				Susceptible
			5/26	6/15	7/12	8/2	7/12
----- (%) -----							
Untreated check			0	0	0	0	0
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i>	0.019	4-5 LF					
triclopyr	0.28	POFL	0	53	91	79	96
(Propanil + molinate) <i>fb</i>	4.5	4-5 LF					
triclopyr	0.28	POFL	0	40	54	23	91
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i>	0.019	4-5 LF					
bispyribac-sodium + Kinetic (0.125%)	0.019	PREFL	0	60	99	100	100
Propanil <i>fb</i>	3.0	2-3 LF					
(propanil + molinate)	4.5	PREFL	0	40	11	0	95
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i>	0.019	4-5 LF					
bispyribac-sodium + Kinetic (0.125%)	0.026	POFL	0	58	96	91	99
Pendimethalin <i>fb</i>	1.0	DPRE					
bispyribac-sodium + Kinetic (0.125%)	0.017	4-5 LF	6	68	98	90	100
Pendimethalin <i>fb</i>	1.0	DPRE					
bispyribac-sodium + Kinetic (0.125%)	0.019	4-5 LF	18	80	99	95	100
Pendimethalin <i>fb</i>	1.0	DPRE					
(propanil + molinate)	4.5	4-5 LF	23	75	64	48	86
Clomazone <i>fb</i>	0.3	PRE					
bispyribac-sodium + Kinetic (0.125%)	0.019	PREFL	25	85	91	74	96
Clomazone <i>fb</i>	0.3	PRE					
bispyribac-sodium + Kinetic (0.125%)	0.019	POFL	23	76	98	88	99
Clomazone <i>fb</i>	0.3	PRE					
(propanil + molinate)	4.5	PREFL	28	86	90	86	100
Thiobencarb <i>fb</i>	3.0	DPRE					
bispyribac-sodium + Kinetic (0.125%)	0.019	4-5 LF	4	66	94	86	99
Thiobencarb <i>fb</i>	3.0	DPRE					
(propanil + molinate)	4.5	4-5 LF	4	75	60	66	100

continued

Table 47. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass (ECHCG) control				
			Resistant			Susceptible	
			5/26	6/15	7/12	8/2	7/12
			----- (%) -----				
Pendimethalin <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	1.0 0.019	DPRE POFL	18	58	93	73	89
Pendimethalin <i>fb</i> bispyribac-sodium + triclopyr + Kinetic (0.125%)	1.0 0.019 0.28	DPRE POFL	6	55	89	71	90
LSD (0.05)			18	15	23	23	10

continued

Table 47. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Northern jointvetch (AESVI)		Hemp sesbania (SEBEX)		Broadleaf signalgrass (BRAPP)	
			5/26	5/26	8/2	6/15	7/12	8/2
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i> triclopyr	0.019 0.28	4-5 LF POFL	0	0	100	66	94	28
(Propanil + molinate) <i>fb</i> triclopyr	4.5 0.28	4-5 LF POFL	0	0	100	79	96	83
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	0.019 0.019	4-5 LF PREFL	0	0	100	66	89	21
Propanil <i>fb</i> (propanil + molinate)	3.0 4.5	2-3 LF PREFL	0	0	75	93	96	100
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	0.019 0.026	4-5 LF POFL	0	0	100	64	90	35

continued

Table 47. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Northern jointvetch (AESVI)		Hemp sesbania (SEBEX)		Broadleaf signalgrass (BRAPP)	
			5/26	5/26	8/2	6/15	7/12	8/2
			----- (%) -----					
Pendimethalin <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	1.0 0.017	DPRE 4-5 LF	53	65	100	65	88	26
Pendimethalin <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	1.0 0.019	DPRE 4-5 LF	70	68	100	74	100	53
Pendimethalin <i>fb</i> (propanil + molinate)	1.0 4.5	DPRE 4-5 LF	74	68	75	76	94	65
Clomazone <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	0.3 0.019	PRE PREFL	83	81	100	84	100	99
Clomazone <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	0.3 0.019	PRE POFL	68	69	98	84	100	98
Clomazone <i>fb</i> (propanil + molinate)	0.3 4.5	PRE PREFL	63	56	95	90	99	100
Thiobencarb <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	3.0 0.019	DPRE 4-5 LF	61	65	100	76	85	40
Thiobencarb <i>fb</i> (propanil + molinate)	3.0 4.5	DPRE 4-5 LF	54	65	100	81	100	95
Pendimethalin <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	1.0 0.019	DPRE POFL	79	80	100	35	50	0
Pendimethalin <i>fb</i> bispyribac-sodium + triclopyr + Kinetic (0.125%)	1.0 0.019 0.28	DPRE POFL	63	70	100	40	83	0
LSD (0.05)			20	15	25	11	20	34

continued

Table 47. Section 3.

Herbicide	Rate (lb/A)	Application timing	Weed control			Effect on rice	
			Rice flatsedge (CYPIR)			Injury	Yield
			6/15	7/12	8/2	5/26	9/8
Untreated check			0	0	0	0	4635
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i>	0.019	4-5 LF					
triclopyr	0.28	POFL	63	100	98	0	8055
(Propanil + molinate) <i>fb</i>	4.5	4-5 LF					
triclopyr	0.28	POFL	75	99	98	0	8145
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i>	0.019	4-5 LF					
bispyribac-sodium + Kinetic (0.125%)	0.019	PREFL	70	100	100	0	8100
Propanil <i>fb</i>	3.0	2-3 LF					
(propanil + molinate)	4.5	PREFL	90	98	100	0	8370
Bispyribac-sodium + Kinetic (0.125%) <i>fb</i>	0.019	4-5 LF					
bispyribac-sodium + Kinetic (0.125%)	0.026	POFL	80	100	100	0	7695
Pendimethalin <i>fb</i>	1.0	DPRE					
bispyribac-sodium + Kinetic (0.125%)	0.017	4-5 LF	80	100	100	0	7920
Pendimethalin <i>fb</i>	1.0	DPRE					
bispyribac-sodium + Kinetic (0.125%)	0.019	4-5 LF	88	100	100	0	8100
Pendimethalin <i>fb</i>	1.0	DPRE					
(propanil + molinate)	4.5	4-5 LF	75	96	75	0	7785
Clomazone <i>fb</i>	0.3	PRE					
bispyribac-sodium + Kinetic (0.125%)	0.019	PREFL	15	100	83	1	8280
Clomazone <i>fb</i>	0.3	PRE					
bispyribac-sodium + Kinetic (0.125%)	0.019	POFL	0	79	79	0	7920
Clomazone <i>fb</i>	0.3	PRE					
(propanil + molinate)	4.5	PREFL	78	100	100	3	8865
Thiobencarb <i>fb</i>	3.0	DPRE					
bispyribac-sodium + Kinetic (0.125%)	0.019	4-5 LF	83	100	100	0	8010
Thiobencarb <i>fb</i>	3.0	DPRE					
(propanil + molinate)	4.5	4-5 LF	83	100	100	0	8325

continued

Table 47. Section 3. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control			Effect on rice	
			Rice flatsedge (CYPIR)			Injury	Yield
			6/15	7/12	8/2	5/26	9/8
			----- (%) -----				(lb/A)
Pendimethalin <i>fb</i>	1.0	DPRE					
bispyribac-sodium + Kinetic (0.125%)	0.019	POFL	0	86	81	0	6975
Pendimethalin <i>fb</i>	1.0	DPRE					
bispyribac-sodium + triclopyr + Kinetic (0.125%)	0.019 0.28	POFL	5	98	71	0	6930
LSD (0.05)			13	6	28	1	1125

Table 48. Propanil-resistant and -susceptible barnyardgrass control with bispyribac-sodium (Regiment), Stuttgart, 1999.

TEST INFORMATION

Location	Stuttgart	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 15 1999
Plot size	6 ft by 16 ft	Crop / Variety	Rice / Drew (Vitavax + Icon)
Row width / Number of rows per plot	6.5 in. / 9 rows	Dates of flushing	May 16, 25, and June 9, 1999
Soil type	Dewitt silt loam (8% sand, 75% silt, 16% clay)	Date of flooding	June 21, 1999
% OM / pH	1 / 5.4		

Comments: MPOST = mid-postemergence; and PREFL = prelood. Rain (0.1 inch) fell 45 minutes after MPOST application. Yield is adjusted to 12% moisture.

Application type	MPOST	PREFL
Date applied	6/8/99	6/18/99
Time	10:00 am	7:00 am
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	89 / 100	69 / 70
Relative humidity (%)	65	66
Wind (mph)	2	4
Weather	clear	clear
Soil moisture	moist	moist
Crop stage/Height	2-3 lf / 6"	4-7 lf, 2 tillers / 11"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Teejet XR / 11001 VS	Teejet XR / 11001 VS
Boom ht / # Noz / Spacing (in.)	15 / 3 / 18	14 / 3 / 18
Gpa / Psi	10 / 41	10 / 42
Weed species (density)	----- [# leaves/height (in.)] -----	
R-ECHCG (21/row ft)	3-5 lf / 3-4"	4-6 lf / 8-10"
ECHCG (29/ft ²)	3-4 lf / 2-4"	4-6 lf / 6-8"
BRAPP (14/ft ²)	3-4 lf / 2-3"	5-6 lf, 1 tiller / 5-6"

Conclusions: One of the weaknesses of bispyribac-sodium is broadleaf signalgrass control. Bispyribac-sodium is, however, very effective on propanil-resistant or -susceptible barnyardgrass at both the 0.018 or 0.02 lb/A rates.

Table 48. Section 1.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass control							
			Resistant (R-ECHCG)				Susceptible (ECHCG)			
			6/9	6/17	7/7	7/28	6/9	6/17	7/7	7/28
			----- (%) -----							
Untreated check			0	0	0	0	0	0	0	0
Glufosinate <i>fb</i>	0.31	EPOST								
glufosinate	0.31	PREFL	100	99	100	100	99	99	100	98
Untreated check			0	0	0	0	0	0	0	0
Bispyribac-sodium + Kinetic (0.125%)	0.018	MPOST	36	41	43	43	48	66	78	64
Bispyribac-sodium + Knetic (0.125%)	0.02	MPOST	53	66	69	81	60	84	88	78
Propanil (Stam M-4)	4.0	MPOST	0	14	30	10	76	85	40	43
Bispyribac-sodium + Kinetic (0.125%)	0.018	PREFL	0	36	91	95	0	33	96	93
Bispyribac-sodium + Kinetic (0.125%)	0.02	PREFL	0	54	98	100	0	40	99	91
Propanil (Stam M-4)	4.0	PREFL	0	15	5	5	0	90	79	61
LSD (0.05)			9	23	14	8	8	16	10	12

continued

Table 48. Section 2.

Herbicide	Rate (lb/A)	Application timing	Broadleaf signalgrass (BRAPP) control			Effect on rice				
						Injury				Yield
			6/17	6/23	7/28	6/17	6/23	7/7	7/28	9/15
			----- (%) -----							
Untreated check			0	0	0	0	0	0	0	3438
Bispyribac-sodium + Kinetic (0.125%)	0.018	MPOST	8	30	26	0	5	0	0	3825
Bispyribac-sodium + Kinetic (0.125%)	0.02	MPOST	13	43	30	15	13	0	0	4975
Propanil (Stam M-4)	4.0	MPOST	75	89	90	9	6	0	0	3826
Bispyribac-sodium + Kinetic (0.125%)	0.018	PREFL	0	24	21	0	20	0	0	5892
Bispyribac-sodium + Kinetic (0.125%)	0.02	PREFL	0	25	35	0	14	0	0	5807
Propanil (Stam M-4)	4.0	PREFL	0	90	91	0	16	0	0	4060
LSD (0.05)			9	19	22	7	8	NS	NS	1000

Table 49. Bispyribac-sodium (Regiment) rate and timing study, Lonoke, 1999.**TEST INFORMATION**

Location	Lonoke	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 15, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Wells
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.3 / 5.1		

Comments: Propanil-resistant barnyardgrass was planted in rows across the plots. 2-3 LF = 2-3 leaf rice; PREFL = pre-flood; and POFL = postflood.

Application type	2-3 LF	PREFL	POFL
Date applied	6/2/99	6/10/99	6/21/99
Time	8:05 am	10:10 am	4:30 pm
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	74 / 68	81 / 78	93 / 80
Relative humidity (%)	78	76	32
Wind (mph)	0	5	6
Weather	cloudy	clear	clear
Soil moisture	saturated	moist	flooded
Crop stage/Height	2-4 lf / 7"	1 tiller / 11"	2-3 tiller / 14"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	18 / 6 / 20	19 / 6 / 20	24 / 6 / 20
Gpa / Psi	10 / 18	10 / 17	10 / 21
Weed species	----- [# leaves/height (in.)] -----		
BRAPP	4 lf / 1"	N/A	N/A
MOLVE	6 lf	N/A	N/A
CYPIR	4 lf / 1"	N/A	N/A
IPLA	3 lf / 2"	N/A	N/A
R-ECHCG	3 lf / 2"	3 lf / 3"	2 tiller / 8"

Conclusions: The objective of this study was to evaluate bispyribac-sodium (Regiment) for control of propanil-resistant barnyardgrass. The study area was oversprayed with propanil (Super Wham) at 2- to 3-leaf rice to eliminate the susceptible biotypes. Bispyribac-sodium at different rates and application timings were applied alone and tank-mixed with propanil. Propanil-resistant barnyardgrass ratings are shown.

Table 49. Section 1.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass (ECHCG) control				
			Resistant			Susceptible	
			6/15	7/12	8/2	7/12	8/2
			----- (%) -----				
Propanil (Super Wham) at 3.0 lb/A + Penetrator Plus (1 pt/A) was applied to entire test at the 2- to 3-leaf stage of rice growth:							
Check (propanil)			0	0	3	83	91
Bispyribac-sodium + Kinetic (0.125%)	0.018	PREFL	38	100	85	100	100
Bispyribac-sodium + Kinetic (0.125%)	0.019	PREFL	43	98	91	100	100
Propanil + Penetrator Plus (1 pt/A)	4.0	PREFL	50	70	59	95	91
Propanil + bispyribac-sodium + Penetrator Plus (1 pt/A)	4.0 0.019	PREFL	60	94	84	100	100
Bispyribac-sodium + Kinetic (0.125%)	0.018	POFL	0	91	83	98	98
Bispyribac-sodium + Kinetic (0.125%)	0.019	POFL	0	91	81	95	98
Propanil + Penetrator Plus (1 pt/A)	4.0	POFL	0	84	31	94	89
Propanil + bispyribac-sodium + Penetrator Plus (1 pt/A)	4.0 0.019	POFL	0	85	75	99	99
LSD (0.05)			8	14	19	3	9

continued

Table 49. Section 2.

Herbicide	Rate (lb/A)	Application timing	Broadleaf signalgrass	Effect on rice		Yield 9/15 (lb/A)
			(BRAPP) control	Injury		
			8/2 -----	6/15 -----	8/2 -----	
				(%)		
Propanil (Super Wham) at 3.0 lb/A + Penetrator Plus (1 pt/A) was applied to entire test at the 2- to 3-leaf stage of rice growth:						
Check (propanil)			100	0	0	8730
Bispyribac-sodium + Kinetic (0.125%)	0.018	PREFL	100	0	0	8550
Bispyribac-sodium + Kinetic (0.125%)	0.019	PREFL	100	0	0	8865
Propanil + Penetrator Plus (1 pt/A)	4.0	PREFL	100	5	0	8550
Propanil + bispyribac-sodium + Penetrator Plus (1 pt/A)	4.0 0.019	PREFL	100	3	0	8595
Bispyribac-sodium + Kinetic (0.125%)	0.018	POFL	100	0	0	8325
Bispyribac-sodium + Kinetic (0.125%)	0.019	POFL	100	0	0	7965
Propanil + Penetrator Plus (1 pt/A)	4.0	POFL	100	0	0	8415
Propanil + bispyribac-sodium + Penetrator Plus (1 pt/A)	4.0 0.019	POFL	100	0	0	8550
LSD (0.05)			NS	3	NS	855

Table 50. Crop tolerance and weed control efficacy from postemergence cyhalofop-butyl (Clincher) tankmix and sequential pre-flood treatments to dry-seeded rice, Stuttgart, 1999.

TEST INFORMATION

Location	Stuttgart	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 16, 1999
Plot size	6 ft by 16 ft	Crop / Variety	Rice / Drew (Vitavax + Icon)
Row width / Number of rows per plot	6.5 in. / 9 rows	Dates of flushing	May 16, 25, and June 9, 1999
Soil type	Dewitt silt loam (8% sand, 75% silt, 16% clay)	Date of flooding	June 21, 1999
% OM / pH	1 / 5.4		

Comments: DPRE = delayed preemergence; EPOST = early postemergence; and PREFL = pre-flood. Yield is adjusted to 12% moisture.

Application type	EPOST	PREFL
Date applied	6/2/99	6/18/99
Time	7:30 am	6:30 am
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	71 / 72	69 / 70
Relative humidity (%)	90	66
Wind (mph)	2	4
Weather	cloudy	clear
Soil moisture	wet	moist
Crop stage/Height	2-3 lf / 6"	4-5 lf / 8"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Teejet XR / 11001 VS	Teejet XR / 11001 VS
Boom ht / # Noz / Spacing (in.)	15 / 3 / 18	14 / 3 / 18
Gpa / Psi	10 / 41	10 / 42
Weed species (density)	----- [# leaves/height (in.)] -----	
R-ECHCG (32/row ft)	2-3 lf / 0.5-1"	4-7 lf, 2 tiller / 8-10"
ECHCG (30/row ft)	2 lf / 0.5-0.75"	4-6 lf, 2 tiller / 6-8"
IPOWR (4/ft ²)	3 lf / 3.5"	6-9 lf, 3 tiller / 3-4"
IPOLA (8/row ft)	2-3 lf / 2-3"	8-10 lf / 3-4"
SEBEX	2-3 lf / 2-4"	8-10 lf / 8-12"
AESVI	3-4 lf / 2.5-3"	6-8 lf / 8-10"

Conclusions: Cyhalofop-butyl was effective for all grass control. The addition of triclopyr was adequate for broadleaf weed control. Although slight differences were observed in the efficacy of the various weed species, there were no significant differences detected in yield among the various herbicide programs.

Table 50. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control									
			Barnyardgrass						Pitted morningglory (IPOLA)			
			Res. (R-ECHCG)			Susc. (ECHCG)						
			6/29	7/7	7/28	6/29	7/7	7/28	6/29	7/7	7/28	
Untreated check			0	0	0	0	0	0	0	0	0	0
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	EPOST										
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	96	94	99	98	100	100	94	99	100	
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	EPOST										
pendimethalin + triclopyr + Agri-Dex (1.25%)	1.0 0.375	PREFL	95	91	85	95	94	91	90	95	100	
Cyhalofop-butyl + Agri-Dex (2.5%) + pendimethalin <i>fb</i>	0.187 1.0	DPOST										
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	97	95	94	98	96	96	93	95	98	
Quinclorac + Agri-Dex (2.5%) <i>fb</i>	0.375	EPOST										
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	97	97	96	97	94	94	97	100	100	
Cyhalofop-butyl + thiobencarb <i>fb</i>	0.187 3.0	EPOST										
cyhalofop-butyl + Agri-Dex (1.25%)	0.187	PREFL	93	95	95	95	91	88	20	19	26	
Propanil (Stam M-4) <i>fb</i>	4.0	EPOST										
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	54	49	53	94	94	90	90	98	99	
Propanil (Stam M-4) + pendimethalin <i>fb</i>	4.0 1.0	EPOST										
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	96	81	71	96	90	83	93	96	100	

continued

Table 50. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control									
			Barnyardgrass						Pitted morningglory (IPOLA)			
			Res. (R-ECHCG)			Susc. (ECHCG)						
			6/29	7/7	7/28	6/29	7/7	7/28	6/29	7/7	7/28	
			----- (%) -----									
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	EPOST										
cyhalofop-butyl + carfentrazone + Agri-Dex (1.25%)	0.187 0.02	PREFL	93	96	92	94	98	99	92	95	96	
Cyhalofop-butyl + propanil (Stam M-4) <i>fb</i>	0.187 2.0	EPOST										
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	82	84	79	92	93	90	91	98	100	
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	EPOST										
propanil (Stam M-4) + triclopyr	4.0 0.25	PREFL	93	96	95	96	100	90	89	94	100	
Propanil (Stam M-4) <i>fb</i> propanil (Stam M-4) + triclopyr	4.0 4.0 0.25	EPOST PREFL	54	58	34	93	95	93	94	99	100	
Propanil (Stam M-4) + quinclorac	4.0 0.375	EPOST	98	100	99	98	98	96	88	93	96	
(Fenoxaprop + safener) <i>fb</i> (fenoxaprop + safener) + triclopyr	0.09 0.09 0.375	EPOST PREFL	97	100	100	97	98	94	88	91	99	
LSD (0.05)			15	10	12	4	5	7	13	12	9	

continued

Table 50. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control									
			Palmleaf morningglory (IPOWER)			Hemp sesbania (SEBEX)			Northern jointvetch (AESVI)			
			6/29	7/7	7/28	6/29	7/7	7/28	6/29	7/7	7/28	
Untreated check			0	0	0	0	0	0	0	0	0	0
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	EPOST										
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	98	100	100	97	98	100	97	100	100	
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	EPOST										
pendimethalin + triclopyr + Agri-Dex (1.25%)	1.0 0.375	PREFL	96	98	100	86	95	98	88	95	99	
Cyhalofop-butyl + Agri-Dex (2.5%) + pendimethalin <i>fb</i>	0.187 1.0	DPOST										
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	93	98	98	91	95	96	90	94	96	
Quinclorac + Agri-Dex (2.5%) <i>fb</i>	0.375	EPOST										
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	97	98	100	98	100	100	96	99	100	
Cyhalofop-butyl + thiobencarb <i>fb</i>	0.187 3.0	EPOST										
cyhalofop-butyl + Agri-Dex (1.25%)	0.187	PREFL	19	21	33	38	46	69	23	21	38	
Propanil (Stam M-4) <i>fb</i>	4.0	EPOST										
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	93	95	100	98	100	99	91	94	96	
Propanil (Stam M-4) + pendimethalin <i>fb</i>	4.0 1.0	EPOST										
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	97	100	100	96	100	100	95	98	100	

continued

Table 50. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control									
			Palmleaf morningglory (IPOWER)			Hemp sesbania (SEBEX)			Northern jointvetch (AESVI)			
			6/29	7/7	7/28	6/29	7/7	7/28	6/29	7/7	7/28	
Untreated check			0	0	0	0	0	0	0	0	0	0
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	EPOST										
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	98	100	100	97	98	100	97	100	100	
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	EPOST										
cyhalofop-butyl + carfentrazone + Agri-Dex (1.25%)	0.187 0.02	PREFL	96	98	94	98	98	98	96	100	98	
Cyhalofop-butyl + propanil (Stam M-4) <i>fb</i>	0.187 2.0	EPOST										
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	95	99	100	97	100	100	93	99	100	
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	EPOST										
propanil (Stam M-4) + triclopyr	4.0 0.25	PREFL	93	98	100	97	100	100	94	93	99	
Propanil (Stam M-4) <i>fb</i>	4.0	EPOST										
propanil (Stam M-4) + triclopyr	4.0 0.25	PREFL	94	99	99	95	99	100	95	100	100	
Propanil (Stam M-4) + quinclorac	4.0 0.375	EPOST	93	95	96	97	100	100	97	100	100	
(Fenoxaprop + safener) <i>fb</i>	0.09	EPOST										
(fenoxaprop + safener) + triclopyr	0.09 0.375	PREFL	91	96	100	97	100	100	94	98	98	
LSD (0.05)			13	8	10	8	6	5	16	7	11	

continued

Table 50. Section 3.

Herbicide	Rate (lb/A)	Application timing	Effect on rice			Yield 6/29 (lb/A)
			Injury			
			6/29	7/7	7/28	
Untreated check			0	0	0	5783
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	EPOST				
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	33	21	9	6745
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	EPOST				
pendimethalin + triclopyr + Agri-Dex (1.25%)	1.0 0.375	PREFL	15	11	0	6451
Cyhalofop-butyl + Agri-Dex (2.5%) + pendimethalin <i>fb</i>	0.187 1.0	DPOST				
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	10	1	0	6792
Quinclorac + Agri-Dex (2.5%) <i>fb</i>	0.375	EPOST				
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	10	0	0	6085
Cyhalofop-butyl + thiobencarb <i>fb</i>	0.187 3.0	EPOST				
cyhalofop-butyl + Agri-Dex (1.25%)	0.187	PREFL	0	0	0	6644
Propanil (Stam M-4) <i>fb</i>	4.0	EPOST				
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	0	0	0	7324
Propanil (Stam M-4) + pendimethalin <i>fb</i>	4.0 1.0	EPOST				
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	15	14	3	7329

continued

Table 50. Section 3. Continued.

Herbicide	Rate (lb/A)	Application timing	Effect on rice			Yield 6/29 (lb/A)
			Injury			
			6/29	7/7	7/28	
Untreated check			0	0	0	5783
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	EPOST				
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	33	21	9	6745
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	EPOST				
cyhalofop-butyl + carfentrazone + Agri-Dex (1.25%)	0.187 0.02	PREFL	3	0	0	6652
Cyhalofop-butyl + propanil (Stam M-4) <i>fb</i>	0.187 2.0	EPOST				
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	15	14	1	6584
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	EPOST				
propanil (Stam M-4) + triclopyr	4.0 0.25	PREFL	1	0	0	7051
Propanil (Stam M-4) <i>fb</i>	4.0	EPOST				
propanil (Stam M-4) + triclopyr	4.0 0.25	PREFL	3	0	0	7184
Propanil (Stam M-4) + quinclorac	4.0 0.375	EPOST	3	0	0	6922
(Fenoxaprop + safener) <i>fb</i>	0.09	EPOST				
(fenoxaprop + safener) + triclopyr	0.09 0.375	PREFL	30	20	10	7324
LSD (0.05)			7	4	3	NS

Table 51. Evaluation of cyhalofop-butyl (Clincher) tankmixes in rice, Rohwer, 1999.**TEST INFORMATION**

Location	Rohwer	Planting date	April 21, 1999
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	5 ft by 17 ft	Crop / Variety	Rice / Lemont
Row width / Number of rows per plot	6 in. / 8 rows	Dates of flushing	April 26, May 5, 11, and 27, 1999
Soil type	clay loam (8% sand, 49% silt, 43% clay)	Date of flooding	June 10, 1999
% OM / pH	3.5 / 6.7		

Comments: PRE = preemergence; EPOST = early postemergence; and PREFL = pre flood.

Application type	PRE	EPOST	PREFL
Date applied	4/23/99	5/17/99	6/7/99
Time	6:45 am	7:00 am	11:30 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	54 / 55	76 / 77	85 / 81
Relative humidity (%)	40	30	60
Wind (mph)	6	5	4
Weather	clear	partly cloudy	
Soil moisture	dry	optimal	dry
Crop stage/Height	N/A	2-3 lf / 3"	4-5 lf / 6"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Flat fan / 8002	Flat fan / 8002	Flat fan / 8002
Boom ht / # Noz / Spacing (in.)	22 / 3 / 19	22 / 3 / 19	22 / 3 / 19
Gpa / Psi	15 / 22	15 / 22	15 / 24
Weed species		(# leaves)	
ECHCG	N/A	2 lf	4-5 lf
SEBEX	N/A	1-2 lf	2-4 lf
IPOLA	N/A	1-2 lf	2-4 lf

Conclusions: No significant injury with any treatment at 8 or 21 DAT. Cyhalofop-butyl (Clincher) alone and in combination with pendimethalin (Prowl) or propanil (Stam) provided greater than 70% control of barnyardgrass 8 days after the EPOST application. Cyhalofop-butyl + pendimethalin and propanil + quinclorac (Facet) provided the best control 21 days after the EPOST treatment. The pre flood application seemed too late to be of great value. If control was not good in EPOST application treatments, the pre flood applications did not improve control.

Table 51. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control				Pitted morningglory (IPOLA)	
			Barnyardgrass (ECHCG)				5/25	6/7
			5/25	6/7	7/8	8/30	5/25	6/7
Untreated check			0	0	0	0	0	0
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	EPOST						
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	71	76	66	61	3	0
Cyhalofop-butyl + Agri-Dex (2.5%) + pendimethalin <i>fb</i>	0.187 1.0	EPOST						
triclopyr + Agri-Dex (1.25%)	0.375	PREFL	86	99	81	73	3	0
Cyhalofop-butyl + Agri-Dex (2.5%) + pendimethalin <i>fb</i>	0.187 1.0	EPOST						
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	81	89	100	54	0	0
Quinclorac + Agri-Dex (2.5%) <i>fb</i>	0.375	EPOST						
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	58	67	28	20	28	84
Cyhalofop-butyl + thiobencarb <i>fb</i>	0.187 3.0	EPOST						
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	71	56	24	23	26	38
Propanil <i>fb</i>	4.0	EPOST						
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	60	30	20	11	53	70
Propanil + pendimethalin <i>fb</i>	4.0 1.0	EPOST						
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	90	83	45	33	94	71

continued

Table 51. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Barnyardgrass (ECHCG)				Pitted morningglory (IPOLA)	
			5/25	6/7	7/8	8/30	5/25	6/7
			----- (%) -----					
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	EPOST						
cyhalofop-butyl + carfentrazone + Agri-Dex (1.25%)	0.187 0.021	PREFL	88	77	49	43	5	8
Cyhalofop-butyl + propanil <i>fb</i>	0.187 2.0	EPOST						
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	85	65	33	28	69	68
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	EPOST						
propanil + triclopyr	4.0 0.25	PREFL	74	71	33	28	3	0
Propanil <i>fb</i>	4.0	EPOST						
propanil + triclopyr	4.0 0.25	PREFL	66	18	0	0	58	83
Propanil + quinclorac	4.0 0.375	EPOST	84	88	47	35	69	96
(Fenoxaprop + safener) <i>fb</i>	0.045	EPOST						
(fenoxaprop + safener) + triclopyr + Agri-Dex (1.25%)	0.045 0.375	PREFL	65	29	8	5	15	0
Propanil <i>fb</i>	4.0	EPOST						
cyhalofop-butyl + Agri-Dex (1.25%)	0.187	PREFL	60	20	15	13	64	48
Clomazone <i>fb</i>	0.5	PRE						
cyhalofop-butyl + triclopyr	0.187 0.375	PREFL	83	57	44	39	0	0
LSD (0.05)			29	42	46	44	34	36

continued

Table 51. Section 2.

Herbicide	Rate (lb/A)	Application timing	Hemp sesbania (SEBEX) control				Rice injury	
			5/25	6/7	7/8	8/30	5/25	6/7
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	EPOST						
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	33	0	73	75	1	0
Cyhalofop-butyl + Agri-Dex (2.5%) + pendimethalin <i>fb</i>	0.187 1.0	EPOST						
triclopyr + Agri-Dex (1.25%)	0.375	PREFL	33	23	95	93	1	0
Cyhalofop-butyl + Agri-Dex (2.5%) + pendimethalin <i>fb</i>	0.187 1.0	EPOST						
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	36	13	100	100	6	0
Quinclorac + Agri-Dex (2.5%) <i>fb</i>	0.375	EPOST						
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	59	73	100	100	3	0
Cyhalofop-butyl + thiobencarb <i>fb</i>	0.187 3.0	EPOST						
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	63	40	99	100	4	0
Propanil <i>fb</i>	4.0	EPOST						
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	100	98	100	100	6	3
Propanil + pendimethalin <i>fb</i>	4.0 1.0	EPOST						
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	94	63	100	100	8	1

continued

Table 51. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Hemp sesbania (SEBEX) control				Rice injury	
			5/25	6/7	7/8	8/30	5/25	6/7
			----- (%) -----					
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	EPOST						
cyhalofop-butyl + carfentrazone + Agri-Dex (1.25%)	0.187 0.021	PREFL	45	8	75	75	4	0
Cyhalofop-butyl + propanil <i>fb</i>	0.187 2.0	EPOST						
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	95	69	100	100	6	0
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	EPOST						
propanil + triclopyr	4.0 0.25	PREFL	48	0	98	100	5	0
Propanil <i>fb</i>	4.0	EPOST						
propanil + triclopyr	4.0 0.25	PREFL	100	99	98	100	5	0
Propanil + quinclorac	4.0 0.375	EPOST	100	99	100	100	13	0
(Fenoxaprop + safener) <i>fb</i>	0.045	EPOST						
(fenoxaprop + safener) + triclopyr + Agri-Dex (1.25%)	0.045 0.375	PREFL	71	0	100	100	4	0
Propanil <i>fb</i>	4.0	EPOST						
cyhalofop-butyl + Agri-Dex (1.25%)	0.187	PREFL	100	90	43	49	8	0
Clomazone <i>fb</i>	0.5	PRE						
cyhalofop-butyl + triclopyr	0.187 0.375	PREFL	5	0	63	60	0	57
LSD (0.05)			49	34	36	34	8	4

Table 52. Cyhalofop-butyl (Clincher) tank-mix and sequential applications, Lonoke, 1999.

TEST INFORMATION

Location	Lonoke	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 17, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Bengal
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.3 / 5.1		

Comments: 2-3 LF = 2-3 leaf cotton; and PREFL = pre flood.

Application type	2-3 LF	PREFL
Date applied	6/2/99	6/9/99
Time	3:35 pm	7:00 pm
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	93 / 70	98 / 80
Relative humidity (%)	57	36
Wind (mph)	4	6
Weather	partly cloudy	clear
Soil moisture	moist	moist
Crop stage/Height	2-3 lf / 4"	early tillering / 8"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	18 / 6 / 20	12 / 6 / 20
Gpa / Psi	10 / 18	10 / 22
Weed species	----- (# leaves/height) -----	
BRAPP	5 lf / 2.5"	1 tiller / 3"
MOLVE	5 lf	N/A
CYPIR	4 lf / 2.5"	5-6 lf / 4"

Conclusions: Weeds were smaller and not as dense in plots that received a 2-3 leaf treatment prior to a pre flood treatment. Cyhalofop-butyl (Clincher) has provided excellent grass control when used in multiple applications. Other herbicides are needed in a program for broadleaf and sedge control.

Table 52. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Broadleaf signalgrass (BRAPP)			Barnyardgrass (ECHCG)		
			6/17	7/12	8/2	6/17	7/12	8/2
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	2-3 LF						
cyhalofop-butyl + triclopyr + Agri-Dex (2.5%)	0.187 0.375	PREFL	76	100	100	85	100	100
Cyhalofop-butyl + Agri-Dex (2.5%) + pendimethalin <i>fb</i>	0.187 1.0	2-3 LF						
triclopyr + Agri-Dex (1.25%)	0.375	PREFL	71	100	100	80	100	100
Cyhalofop-butyl + Agri-Dex (2.5%) + pendimethalin <i>fb</i>	0.187 1.0	2-3 LF						
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	81	100	100	86	100	100
Quinclorac + Agri-Dex (2.5%) <i>fb</i>	0.375	2-3 LF						
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	65	100	100	73	99	100
Cyhalofop-butyl + thiobencarb <i>fb</i>	0.187 3.0	2-3 LF						
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	68	100	100	79	99	96
Propanil <i>fb</i>	4.0	2-3 LF						
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	91	100	100	64	95	80
Propanil + pendimethalin <i>fb</i>	4.0 1.0	2-3 LF						
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	95	100	100	81	99	94

continued

Table 52. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Broadleaf signalgrass (BRAPP)			Barnyardgrass (ECHCG)		
			6/17	7/12	8/2	6/17	7/12	8/2
			----- (%) -----					
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	2-3 LF						
cyhalofop-butyl + carfentrazone + Agri-Dex (1.25%)	0.187 0.021	PREFL	73	100	100	79	100	100
Cyhalofop-butyl + propanil <i>fb</i>	0.187 2.0	2-3 LF						
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	95	100	100	94	100	100
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	2-3 LF						
propanil + triclopyr	4.0 0.25	PREFL	90	100	100	90	100	99
Propanil <i>fb</i>	4.0	2-3 LF						
propanil + triclopyr	4.0 0.25	PREFL	95	100	100	69	92	59
Propanil + quinclorac	4.0 0.375	2-3 LF	95	100	100	93	100	100
(Fenoxaprop + safener) <i>fb</i>	0.045							
(fenoxaprop + safener) + triclopyr + Agri-Dex (1.25%)	0.045 0.375	PREFL	94	100	100	93	100	95
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	2-3 LF						
cyhalofop-butyl + Agri-Dex (2.5%)	0.187	PREFL	66	100	100	74	100	100
LSD (0.05)			9	1	1	14	6	15

continued

Table 52. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control			Effect on rice	
			Rice flatsedge (CYPIR)		Amazon sprangletop (LEFPA)	Injury	Yield
			6/17	8/2	8/2	6/17	9/17
Untreated check			0	0	0	0	3105
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	2-3 LF					
cyhalofop-butyl + triclopyr + Agri-Dex (2.5%)	0.187 0.375	PREFL	48	78	100	9	7110
Cyhalofop-butyl + Agri-Dex (2.5%) + pendimethalin <i>fb</i>	0.187 1.0	2-3 LF					
triclopyr + Agri-Dex (1.25%)	0.375	PREFL	54	79	100	14	6615
Cyhalofop-butyl + Agri-Dex (2.5%) + pendimethalin <i>fb</i>	0.187 1.0	2-3 LF					
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	51	76	100	5	6345
Quinclorac + Agri-Dex (2.5%) <i>fb</i>	0.375	2-3 LF					
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	53	96	85	6	6075
Cyhalofop-butyl + thiobencarb <i>fb</i>	0.187 3.0	2-3 LF					
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	59	98	99	9	6570
Propanil <i>fb</i>	4.0	2-3 LF					
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	95	100	100	10	6570
Propanil + pendimethalin <i>fb</i>	4.0 1.0	2-3 LF					
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	99	100	100	6	6570

continued

Table 52. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control			Effect on rice	
			Rice flatsedge (CYPIR)		Amazon sprangletop (LEFPA)	Injury	Yield
			6/17	8/2	8/2	6/17	9/17
			----- (%) -----			(lb/A)	
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	2-3 LF					
cyhalofop-butyl + carfentrazone + Agri-Dex (1.25%)	0.187 0.021	PREFL	30	78	100	4	6210
Cyhalofop-butyl + propanil <i>fb</i>	0.187 2.0	2-3 LF					
cyhalofop-butyl + triclopyr + Agri-Dex (1.25%)	0.187 0.375	PREFL	94	100	100	6	6885
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	2-3 LF					
propanil + triclopyr	4.0 0.25	PREFL	75	100	100	6	6525
Propanil <i>fb</i>	4.0	2-3 LF					
propanil + triclopyr	4.0 0.25	PREFL	100	100	100	5	5940
Propanil + quinclorac	4.0 0.375	2-3 LF	95	100	100	4	6795
(Fenoxaprop + safener) <i>fb</i>	0.045	2-3 LF					
(fenoxaprop + safener) + triclopyr + Agri-Dex (1.25%)	0.045 0.375	PREFL	30	100	100	10	6750
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.187	2-3 LF					
cyhalofop-butyl + Agri-Dex (2.5%)	0.187	PREFL	30	75	88	3	6030
LSD (0.05)			15	29	9	6	630

Table 53. Evaluation of adjuvants with quinclorac (Facet) early postemergence, Stuttgart, 1999.**TEST INFORMATION**

Location	Stuttgart	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 15, 1999
Plot size	6 ft by 16 ft	Crop / Variety	Rice / Drew
Row width / Number of rows per plot	6.5 in. / 9 rows	Dates of flushing	May 16, 25, and June 9, 1999
Soil type	Dewitt silt loam (3% sand, 75% silt, 14% clay)	Date of flooding	June 21, 1999
% OM / pH / CEC	1 / 5.4 / 155		

Comments: EPOST = early postemergence. Yield adjusted to 12% moisture.

Application type	EPOST
Date applied	6/2/99
Time	7:00 pm
Incorporation equipment	N/A
Air/Soil temperature (F)	82 / 86
Relative humidity (%)	82
Wind (mph)	1
Weather	partly cloudy
Soil moisture	wet
Crop stage/Height	2-3 lf / 6"
Sprayer type/mph	BkPkCO ₂ / 3
Nozzle type/Size	Teejet XR / 11001 VS
Boom ht / # Noz / Spacing (in.)	14 / 3 / 18
Gpa / Psi	10 / 42
Weed species (density)	[# leaves/height (in.)]
R-ECHCG (28/row ft)	2-3 lf / 0.5-1"
ECHCG (29/ft ²)	2 lf / 0.5-0.75"
IPOWR (9/ft ²)	3 lf / 3.5"

Conclusions: Propanil-resistant barnyardgrass control was least when quinclorac was applied with Crop Oil Plus and Peptoil, but control of susceptible barnyardgrass and broadleaf signalgrass was not greatly affected by the various adjuvants. Although control of propanil-resistant barnyardgrass was less with Crop Oil Plus and Peptoil, rice yield from these treatments were among the highest observed.

Table 53. Section 1.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass control					
			Resistant (R-ECHCG)			Susceptible (ECHCG)		
			6/18	6/29	7/28	6/18	6/29	7/28
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Quinclorac + Crop Oil Plus (1.0 qt/A)	0.19	EPOST	88	85	71	94	93	94
Quinclorac + Hi-Per-Oil (0.5 gal/100 gal)	0.19	EPOST	90	88	90	94	93	93
Quinclorac + Hasten (1.5 pt/A)	0.19	EPOST	88	89	90	93	93	98
Quinclorac + Placement (2.0 oz/A) + Crop Oil Plus (1.0 qt/A)	0.19	EPOST	88	93	83	93	94	95
Quinclorac + Pro-Pak (1.0 gal/100 gal) + Crop Oil Plus (1.0 qt/A)	0.19	EPOST	85	81	81	90	93	92
Quinclorac + WDA194 (2.0 oz/A) + Crop Oil Plus (1.0 qt/A)	0.19	EPOST	80	70	55	91	94	92
Quinclorac + Eth-N-Gard (0.25 gal/100 gal)	0.19	EPOST	91	91	83	90	93	95
Quinclorac + WDA191 (9.0 lb/100 gal) + Crop Oil Plus (1.0 qt/A)	0.19	EPOST	90	91	91	93	93	92
Quinclorac + Peptoil (1.0 qt/A)	0.19	EPOST	85	74	78	93	91	91
Quinclorac (no adjuvant)	0.19	EPOST	84	95	90	91	95	92
LSD (0.05)			7	11	13	4	3	6

continued

Table 53. Section 2.

Herbicide	Rate (lb/A)	Broadleaf signalgrass		Effect on rice			Yield 9/15 (lb/A)
		Application timing	(BRAPP) control	Injury			
			6/18	6/18	6/29	7/28	
Untreated check			0	0	0	0	2811
Quinclorac + Crop Oil Plus (1.0 qt/A)	0.19	EPOST	94	0	1	0	7354
Quinclorac + Hi-Per-Oil (0.5 gal/100 gal)	0.19	EPOST	94	0	3	0	6796
Quinclorac + Hasten (1.5 pt/A)	0.19	EPOST	94	0	1	0	7145
Quinclorac + Placement (2.0 oz/A) + Crop Oil Plus (1.0 qt/A)	0.19	EPOST	93	0	1	0	6734
Quinclorac + Pro-Pak (1.0 gal/100 gal) + Crop Oil Plus (1.0 qt/A)	0.19	EPOST	91	0	1	0	6519
Quinclorac + WDA194 (2.0 oz/A) + Crop Oil Plus (1.0 qt/A)	0.19	EPOST	93	0	3	0	6485
Quinclorac + Eth-N-Gard (0.25 gal/100 gal)	0.19	EPOST	93	0	3	0	7527
Quinclorac + WDA191 (9.0 lb/100 gal) + Crop Oil Plus (1.0 qt/A)	0.19	EPOST	93	0	4	0	7254
Quinclorac + Peptoil (1.0 qt/A)	0.19	EPOST	93	0	1	0	6905
Quinclorac (no adjuvant)	0.19	EPOST	90	0	0	0	6883
LSD (0.05)			3	NS	NS	NS	554

Table 54. Quinclorac granular vs dry-flowable postemergence flood depth evaluation, Stuttgart, 1999.

TEST INFORMATION

Location	Stuttgart	Planting date	May 11, 1999
Experimental Design / replications	Split plot / 4	Harvest	September 15, 1999
Plot size	6 ft by 16 ft	Crop / Variety	Rice / Drew (Vitavax & Icon Trt.)
Row width / Number of rows per plot	6.5 in. / 9 rows	Dates of flushing	May 16, 25 and June 9, 1999
Soil type	Dewitt silt loam (3% sand, 83% silt, 14% clay)	Date of flooding	June 17, 1999
% OM / pH	1 / 5.6		

Comments: PREFL = before flood when grass was 2 to 3 inches tall; POFL = after flood when grass was 6 to 10 inches tall.

Application type	POFL
Date applied	6/18/99
Time	8:00 am
Incorporation equipment	N/A
Air/Soil temperature (F)	69 / 70
Relative humidity (%)	66
Wind (mph)	4
Weather	clear
Soil moisture	flooded
Crop stage/Height	4-6 lf / 10"
Sprayer type/mph	BkPkCO ₂ / 3
Nozzle type/Size	Teejet XR / 11001 VS
Boom ht / # Noz / Spacing (in.)	14 / 3 / 18
Gpa / Psi	10 / 42
Weed species (density)	[height (in.)]
ECHCG (24/ft ²)	6-10"

Conclusions: The 75 DF formulation of quinclorac provided better control when applied in a shallow flood as compared to a standard flood depth, while the 1.5 G formulation control did not greatly differ with flood depth. Also, barnyardgrass size did not greatly influence herbicide activity. Yields were greatest when the 75 DF formulation was used in a shallow flood.

Table 54.

Herbicide	Rate (lb/A)	Grass height (in.)	Barnyardgrass (ECHCG) control			Effect on rice			Yield 9/15 (lb/A)
			7/7	7/13	7/29	Injury			
			----- (%) -----			7/7	7/13	7/29	
Flood depth 3-4":									
Untreated check			0	0	0	0	0	0	4881
Quinclorac (75 DF) + Agri-Dex (1.25%)	0.375	3-5	59	61	71	0	0	0	5579
Quinclorac (1.5 GR)	0.375	3-5	44	49	54	0	0	0	5507
Molinate	3.0	3-5	80	89	85	0	0	0	6176
Quinclorac (75 DF) + Agri-Dex (1.25%)	0.375	6-10	58	79	79	0	0	0	5538
Quinclorac (1.5 GR)	0.375	6-10	36	54	53	0	0	0	5427
Molinate	5.0	6-10	80	81	83	0	0	0	6229
Flood depth 0.5-1":									
Untreated check			0	0	0	0	0	0	4502
Quinclorac (75 DF) + Agri-Dex (1.25%)	0.375	3-5	79	85	93	0	0	0	6738
Quinclorac (1.5 GR)	0.375	3-5	40	40	51	0	0	0	6190
Quinclorac (75 DF) + Agri-Dex (1.25%)	0.375	6-10	65	69	83	0	0	0	6888
Quinclorac (1.5 GR)	0.375	6-10	33	33	31	0	0	0	4928
LSD (0.05)			11	14	15	NS	NS	NS	682

Table 55. Evaluation of injury and efficacy of quinclorac (Facet) and clomazone (Command) PPI, PRE, and DPRE, Stuttgart, 1999.

TEST INFORMATION

Location	Stuttgart	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 15, 1999
Plot size	6 ft by 16 ft	Crop / Variety	Rice / Drew
Row width / Number of rows per plot	6.5 in. / 9 rows	Dates of flushing	May 16, 25, and June 10, 1999
Soil type	Dewitt silt loam (8% sand, 75% silt, 16% clay)	Date of flooding	June 21, 1999
% OM / pH	1 / 5.4		

Comments: PPI = preplant incorporated; PRE = preemergence; DPRE = delayed preemergence; EPOST = early postemergence; and PREFL = pre-flood. Yield is adjusted to 12% moisture.

Application type	PPI	PRE	DPRE	EPOST	PREFL
Date applied	5/11/99	5/12/99	5/18/99	6/2/99	6/18/99
Time	11:30 am	8:17 pm	10:30 am	1:00 pm	8:30 am
Incorporation equipment	Triple-K	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	71 / 78	78 / 76	75 / 75	82 / 86	69 / 70
Relative humidity (%)	86	62	72	82	66
Wind (mph)	4	2	2	2	4
Weather	cloudy	mostly clear	clear	partly cloudy	
Soil moisture	normal	normal	normal	moist	moist
Crop stage/Height	N/A	N/A	N/A	3-4 lf / 5"	5-7 lf, 1 tiller / 11"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Teejet / 110015 VP	Teejet / 110015 VPT	Teejet / 110015 VP	Teejet / 11001 VS	Teejet / 11001 VS
Boom ht / # Noz / Spacing (in.)	14 / 3 / 16	14 / 3 / 16	14 / 3 / 16	14 / 3 / 16	14 / 3 / 16
Gpa / Psi	10 / 28	10 / 28	10 / 28	10 / 42	10 / 42
Weed species (density)	----- [# leaves/height (in.)] -----				
S-ECHCG (35/row ft)	N/A	N/A	N/A	2-3 lf / 1.5"	4-6 lf, 1 tiller / 4-6"
R-ECHCG (20/row ft)	N/A	N/A	N/A	2 lf / 1"	3 lf / 4-5"
BRAPP (0.5/ft)	N/A	N/A	N/A	3-4 lf / 3"	9-11 lf / 5-6"

Conclusions: Chlorosis ratings were highest in PPI treatments of clomazone 7 DAE at 0.4 (60%) and 0.5 lb ai/A (65%) with all noticeable injury negligible at 28 DAE. Control of propanil-resistant and -susceptible barnyardgrass with clomazone was limited to 0.3 lb/A at all application timings. Barnyardgrass control >95% was achieved with label rates of quinclorac at all timings, along with 84% control from label rates of pendimethalin and thiobencarb DPRE. Pendimethalin combinations and bispyribac-sodium at 0.019 lb ai/A gave >90% control of both biotypes of barnyardgrass. Lower rates of clomazone at 0.1 and 0.2 failed to give season-long control as did fenoxprop + safener.

Table 55. Section 1.

Herbicide	Rate (lb/A)	Application timing	Susceptible barnyardgrass (ECHCG) control					
			6/3	6/9	6/18	6/24	6/29	7/13
			----- (%) -----					
Untreated check			0	0	0		0	0
Quinclorac	0.25	PPI	71	98	97		98	98
Quinclorac	0.38	PPI	100	98	100		100	99
Quinclorac	0.5	PPI	99	100	100		100	100
Clomazone	0.1	PPI	94	93	92		91	66
Clomazone	0.2	PPI	90	95	97		100	75
Clomazone	0.3	PPI	93	100	100		99	100
Clomazone	0.4	PPI	94	100	100		100	100
Clomazone	0.5	PPI	94	100	100		100	100
Quinclorac	0.25	PRE	98	99	100		100	100
Quinclorac	0.38	PRE	99	100	100		100	100
Quinclorac	0.5	PRE	99	100	100		100	100
Clomazone	0.1	PRE	94	99	100		100	99
Clomazone	0.2	PRE	95	100	100		100	100
Clomazone	0.3	PRE	95	100	100		99	97
Clomazone	0.4	PRE	94	100	100		100	100
Clomazone	0.5	PRE	95	100	100		100	100
Clomazone	0.1	DPRE	75	69	60		69	48
Clomazone	0.2	DPRE	93	96	98		96	80
Clomazone	0.3	DPRE	93	100	100		100	98
Clomazone	0.4	DPRE	92	100	100		100	100
Clomazone	0.5	DPRE	92	100	100		100	100
Quinclorac	0.38	DPRE	98	100	100		100	99
Pendimethalin	1.0	DPRE	100	100	100		100	97
Thiobencarb	4.0	DPRE	72	99	99		97	81
Pendimethalin	1.5	DPRE	100	100	100		100	100
Pendimethalin <i>fb</i>	1.0	DPRE						
pendimethalin	1.0	EPOST	100	100	100	100	99	100
Pendimethalin + clomazone	1.0 0.3	DPRE	100	100	100	100	100	100
Pendimethalin <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	1.0 0.02	DPRE EPOST	100	100	100	100	100	100
Pendimethalin <i>fb</i> fenoxypop + safener	1.0 0.134	DPRE EPOST	100	100	100	100	100	100
Bispyribac-sodium + Kinetic (0.125%)	0.02	PREFL	0	0	25	43	85	91
Fenoxypop + safener	0.134	PREFL	0	0	0	0	45	43
LSD (0.05)			19	7	14	3	7	14

continued

Table 55. Section 2.

Herbicide	Rate (lb/A)	Application timing	Resistant barnyardgrass (R-ECHCG) control						
			5/26	6/3	6/9	6/18	6/24	6/29	7/13
			----- (%) -----						
Untreated check			0	0	0	0		0	0
Quinclorac	0.25	PPI	90	93	98	98		97	97
Quinclorac	0.38	PPI	100	100	98	100		100	98
Quinclorac	0.5	PPI	98	100	99	100		100	100
Clomazone	0.1	PPI	98	92	92	96		95	69
Clomazone	0.2	PPI	98	95	98	98		100	67
Clomazone	0.3	PPI	98	95	100	100		98	99
Clomazone	0.4	PPI	98	95	100	100		100	99
Clomazone	0.5	PPI	99	96	100	100		100	100
Quinclorac	0.25	PRE	96	95	98	100		100	100
Quinclorac	0.38	PRE	100	99	99	100		100	100
Quinclorac	0.5	PRE	99	98	100	100		100	100
Clomazone	0.1	PRE	98	96	99	100		100	99
Clomazone	0.2	PRE	100	96	100	100		100	100
Clomazone	0.3	PRE	98	95	99	100		98	99
Clomazone	0.4	PRE	98	95	100	100		99	100
Clomazone	0.5	PRE	99	94	100	100		100	100
Clomazone	0.1	DPRE	95	75	64	35		75	40
Clomazone	0.2	DPRE	96	97	100	99		98	81
Clomazone	0.3	DPRE	96	95	100	100		100	95
Clomazone	0.4	DPRE	98	95	100	100		100	100
Clomazone	0.5	DPRE	98	94	100	100		100	100
Quinclorac	0.38	DPRE	100	98	100	100		100	96
Pendimethalin	1.0	DPRE	100	100	99	100		100	83
Thiobencarb	4.0	DPRE	100	94	98	99		99	85
Pendimethalin	1.5	DPRE	100	100	99	100		99	100
Pendimethalin <i>fb</i>	1.0	DPRE							
pendimethalin	1.0	EPOST	100	100	100	100	100	100	99
Pendimethalin + clomazone	1.0 0.3	DPRE	100	100	100	100	100	100	100
Pendimethalin <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	1.0 0.02	DPRE EPOST	100	100	100	100	100	100	100
Pendimethalin <i>fb</i> fenoxypop + safener	1.0 0.134	DPRE EPOST	100	100	100	100	100	100	100
Bispyribac-sodium + Kinetic (0.125%)	0.02	PREFL	0	0	0	0	43	81	95
Fenoxypop + safener	0.134	PREFL	0	0	0	0	0	43	38
LSD (0.05)			6	10	9	12	3	6	17

continued

Table 55. Section 3.

Herbicide	Rate (lb/A)	Application timing	Rice chlorosis						
			5/26	6/3	6/9	6/18	6/24	6/29	7/13
			----- (%) -----						
Untreated check			0	0	0	0		0	0
Quinclorac	0.25	PPI	0	0	0	0		0	0
Quinclorac	0.38	PPI	0	0	0	0		0	0
Quinclorac	0.5	PPI	0	0	0	0		0	0
Clomazone	0.1	PPI	0	3	1	0		0	0
Clomazone	0.2	PPI	3	7	2	1		0	0
Clomazone	0.3	PPI	14	16	5	2		0	0
Clomazone	0.4	PPI	60	56	23	13		3	0
Clomazone	0.5	PPI	65	53	21	13		4	0
Quinclorac	0.25	PRE	0	0	0	0		0	0
Quinclorac	0.38	PRE	0	0	0	0		0	0
Quinclorac	0.5	PRE	0	0	0	0		0	0
Clomazone	0.1	PRE	10	20	7	0		0	0
Clomazone	0.2	PRE	5	7	3	0		0	0
Clomazone	0.3	PRE	5	11	2	0		0	0
Clomazone	0.4	PRE	13	13	6	1		0	0
Clomazone	0.5	PRE	11	24	4	1		0	0
Clomazone	0.1	DPRE	0	0	0	0		0	0
Clomazone	0.2	DPRE	1	3	1	0		0	0
Clomazone	0.3	DPRE	1	6	2	0		0	0
Clomazone	0.4	DPRE	4	10	5	1		0	0
Clomazone	0.5	DPRE	5	30	10	3		0	0
Quinclorac	0.38	DPRE	0	0	0	0		0	0
Pendimethalin	1.0	DPRE	0	0	0	0		0	0
Thiobencarb	4.0	DPRE	0	0	0	0		0	0
Pendimethalin	1.5	DPRE	0	0	0	0	0	0	0
Pendimethalin <i>fb</i>	1.0	DPRE							
pendimethalin	1.0	EPOST	0	0	0	0	0	0	0
Pendimethalin + clomazone	1.0 0.3	DPRE	0	4	1	0	0	0	0
Pendimethalin <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	1.0 0.02	DPRE EPOST	0	0	0	0	0	0	0
Pendimethalin <i>fb</i> fenoxypop + safener	1.0 0.134	DPRE EPOST	0	0	0	0	0	0	0
Bispyribac-sodium + Kinetic (0.125%)	0.02	PREFL	0	0	0	0	0	0	0
Fenoxypop + safener	0.134	PREFL	0	0	0	0	0	0	0
LSD (0.05)			8	12	4	3	NS	1	NS

continued

Table 55. Section 4.

Herbicide	Rate (lb/A)	Application timing	Rice biomass reduction						
			5/26	6/3	6/9	6/18	6/24	6/29	7/13
			----- (%) -----						
Untreated check			0	0	0	0		0	0
Quinclorac	0.25	PPI	5	0	0	0		0	0
Quinclorac	0.38	PPI	13	5	5	0		0	0
Quinclorac	0.5	PPI	13	5	5	1		0	0
Clomazone	0.1	PPI	0	0	0	0		0	0
Clomazone	0.2	PPI	0	3	0	0		0	0
Clomazone	0.3	PPI	5	4	5	0		0	0
Clomazone	0.4	PPI	20	33	23	16		5	0
Clomazone	0.5	PPI	20	26	20	6		8	0
Quinclorac	0.25	PRE	0	5	0	0		0	0
Quinclorac	0.38	PRE	4	3	5	0		0	0
Quinclorac	0.5	PRE	5	3	4	1		4	0
Clomazone	0.1	PRE	0	6	4	0		0	0
Clomazone	0.2	PRE	0	5	3	0		0	0
Clomazone	0.3	PRE	0	1	0	0		0	0
Clomazone	0.4	PRE	1	3	3	0		0	0
Clomazone	0.5	PRE	0	5	0	0		0	0
Clomazone	0.1	DPRE	0	0	0	0		0	0
Clomazone	0.2	DPRE	0	0	0	0		0	0
Clomazone	0.3	DPRE	0	1	0	0		0	0
Clomazone	0.4	DPRE	0	1	4	0		0	0
Clomazone	0.5	DPRE	0	10	8	0		0	0
Quinclorac	0.38	DPRE	0	0	0	0		0	0
Pendimethalin	1.0	DPRE	0	0	0	0		0	0
Thiobencarb	4.0	DPRE	0	0	0	0		0	0
Pendimethalin	1.5	DPRE	0	0	0	0		0	0
Pendimethalin <i>fb</i>	1.0	DPRE							
pendimethalin	1.0	EPOST	0	0	0	0	0	0	0
Pendimethalin + clomazone	1.0 0.3	DPRE	0	0	1	0	1	0	0
Pendimethalin <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	1.0 0.02	DPRE EPOST	0	0	0	0	0	0	0
Pendimethalin <i>fb</i> fenoxypop + safener	1.0 0.134	DPRE EPOST	0	0	0	0	0	0	0
Bispyribac-sodium + Kinetic (0.125%)	0.02	PREFL	0	0	0	0	1	0	0
Fenoxypop + safener	0.134	PREFL	0	0	0	0	0	0	0
LSD (0.05)			12	9	7	6	NS	3	NS

continued

Table 55. Section 5.

Herbicide	Rate (lb/A)	Application timing	Effect on rice							Yield 10/12 (lb/A)
			Injury							
			5/26	6/3	6/9	6/18	6/24	6/29	7/13	
----- (%) -----										
Untreated check			0	0	0	0		0	0	4658
Quinclorac	0.25	PPI	5	11	0	0		0	0	6745
Quinclorac	0.38	PPI	10	15	4	1		3	0	7015
Quinclorac	0.5	PPI	8	18	5	7		3	0	6709
Clomazone	0.1	PPI	0	0	0	0		0	0	6746
Clomazone	0.2	PPI	0	3	0	0		0	0	7115
Clomazone	0.3	PPI	4	7	5	0		0	0	6726
Clomazone	0.4	PPI	19	44	23	8		6	0	6358
Clomazone	0.5	PPI	24	19	21	10		10	0	7121
Quinclorac	0.25	PRE	0	11	1	0		0	0	7092
Quinclorac	0.38	PRE	8	15	5	2		9	0	6532
Quinclorac	0.5	PRE	8	15	5	4		5	0	6620
Clomazone	0.1	PRE	0	9	4	0		0	0	7335
Clomazone	0.2	PRE	0	6	3	0		0	0	7219
Clomazone	0.3	PRE	0	4	0	0		0	0	7519
Clomazone	0.4	PRE	1	8	3	0		0	0	7542
Clomazone	0.5	PRE	0	9	0	0		0	0	7468
Clomazone	0.1	DPRE	0	1	0	0		0	0	6890
Clomazone	0.2	DPRE	0	1	0	0		0	0	6485
Clomazone	0.3	DPRE	0	4	0	0		0	0	7772
Clomazone	0.4	DPRE	0	5	4	0		0	0	6835
Clomazone	0.5	DPRE	0	13	8	1		0	0	7287
Quinclorac	0.38	DPRE	0	4	0	0		0	0	7227
Pendimethalin	1.0	DPRE	0	0	0	0		0	0	7229
Thiobencarb	4.0	DPRE	0	1	0	0		0	0	6826
Pendimethalin	1.5	DPRE	0	1	0	0		0	0	8127
Pendimethalin <i>fb</i> pendimethalin	1.0	DPRE EPOST	0	2	0	0	0	0	0	7537
Pendimethalin + clomazone	1.0 0.3	DPRE	0	1	1	0	1	0	0	6990
Pendimethalin <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	1.0 0.02	DPRE EPOST	0	0	0	0	0	0	0	7095
Pendimethalin <i>fb</i> fenoxypop + safener	1.0 0.134	DPRE EPOST	0	1	0	0	3	0	0	7312
Bispyribac-sodium + Kinetic (0.125%)	0.02	PREFL	0	0	0	0	8	0	0	7114
Fenoxypop + safener	0.134	PREFL	0	0	0	0	1	0	0	6650
LSD (0.05)			12	10	6	3	4	5	NS	1018

Table 56. Quinclorac (Facet) flood depth study, Lonoke, 1999.

TEST INFORMATION

Location	Lonoke	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 20, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Wells
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.3 / 5.1		

Comments: Hemp sesbania was planted on rows across the plots. POFL = postflood. G = granular formulation; DF = dry flowable formulation mixed and sprayed in water carrier.

Application type	POFL
Date applied	6/21/99
Time	2:00 pm
Incorporation equipment	N/A
Air/Soil temperature (F)	93 / 80
Relative humidity (%)	32
Wind (mph)	4
Weather	clear
Soil moisture	flooded
Crop stage/Height	2-3 tiller / 14"
Sprayer type/mph	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	25 / 6 / 20
Gpa / Psi	10 / 21
Weed species	(# leaves/height)
BRAPP	4 tiller / 11"
ECHCG	5 lf / 1"
IPOLA	1 runner / 6"
SEBEX	5 lf / 10"

Conclusions: This study was conducted to determine the effect of flooding depth on salvage grass control with quinclorac (Facet) granules. Research in 1998 indicated that a shallow flood depth, at and immediately following application, was better than a deeper flood depth. Results from this study indicated an opposite effect. However, through the years the spray formulation of quinclorac has provided much better postemergence control of grasses than has the granular formulation.

Table 56.

Herbicide	Rate (lb/A)	Application timing	Weed control			Rice yield (lb/A)
			Broadleaf signalgrass (BRAPP)		Yellow nutsedge (CYPES)	
			7/12	8/2	8/2	
			----- (%) -----			
1-2 inch flood:						
Untreated check			0	0	0	3555
Quinclorac (75 DF) + Agri-Dex (1.25%)	0.375	POFL	5	18	25	4905
Quinclorac (1.5 G)	0.375	POFL	0	30	50	4185
Molinate (15 G)	4.0	POFL	0	13	100	4455
5-6 inch flood:						
Untreated check			15	5	0	4005
Quinclorac (75 DF) + Agri-Dex (1.25%)	0.375	POFL	63	36	0	6075
Quinclorac (1.5 G)	0.375	POFL	43	28	0	5625
Molinate (15 G)	4.0	POFL	45	5	0	5040
LSD (0.05)			23	20	41	720

Table 57. Triclopyr (Grandstand) timing and tank mixes for broadleaf weed control, Rohwer, 1999.

TEST INFORMATION

Location	Rohwer	Planting date	April 22, 1999
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	5 ft by 17 ft	Crop / Variety	Rice / Lemont
Row width / Number of rows per plot	6 in. / 8 rows	Dates of flushing	May 5, 11, and 27, 1999
Soil type	silty clay (8% sand, 49% silt, 43% clay)	Date of flooding	June 10, 1999
% OM / pH	3.5 / 6.7		

Comments: DPRE = delayed preemergence; EPOST = early postemergence; and PREFL = pre flood.

Application type	DPRE	EPOST	PREFL
Date applied	5/3/99	5/17/99	6/7/99
Time	10:00 am	7:00 am	8:00 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	78 / 67	79 / 78	80 / 78
Relative humidity (%)	70	30	90
Wind (mph)	6	7	2
Weather	partly cloudy	partly cloudy	
Soil moisture	dry	dry	dry
Crop stage/Height	N/A	5"	panicle initiation / 10"
Sprayer type/mph	4-Wheeler O ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Flat fann / 8003	Flat fan / 8002	Flat fan / 8002
Boom ht / # Noz / Spacing (in.)	22 / 3 / 19	22 / 3 / 19	22 / 3 / 19
Gpa / Psi	15 / 22	15 / 22	15 / 24
Weed species		[# leaves/height (in.)]	
ECHCG	N/A	2-3 lf	2-5 lf
SEBEX	N/A	3-5 lf	2-5 lf
IPOHE	N/A	2-4 lf	2-5 lf

Conclusions: Broadleaf weed pressure in this study was much lighter than desired for good separation of treatments. Triclopyr (Grandstand) appeared to provide better hemp sesbania control when applied early postemergence or pre flood (at panicle initiation). The PREFL applications failed to control hemp sesbania. This may have been caused by regrowth after severe herbicide injury following the PREFL application. The younger hemp sesbania receiving the early postemergence applications may have been more sensitive to the herbicide. Permanent flood immediately following the PREFL application may have prevented the hemp sesbania from recovering from the herbicide injury. Hemp sesbania regrowth following severe injury was noted in other combination with triclopyr. No triclopyr rate response was noted.

Table 57.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Barnyardgrass (ECHCG)		Hemp sesbania (SEBEX)			Ivyleaf morningglory (IPOHE)
			5/25	8/24	5/25	6/7	8/24	5/25
----- (%) -----								
Entire test was treated with quinclorac, 0.38, DPRE on 3 May 1999:								
Check			100	98	93	25	43	98
Triclopyr + AG-98 (0.25%)	0.19	EPOST	100	100	98	99	81	98
Triclopyr + bispyribac-sodium	0.18 0.133	EPOST	100	98	100	76	81	100
Triclopyr + AG-98 (0.25%)	0.25	PREFL	96	75	96	50	94	100
Triclopyr + bispyribac-sodium	0.25 0.133	PREFL	100	99	86	22	93	100
Triclopyr + AG-98 (0.25%)	0.38	PREFL	99	88	97	25	100	100
Triclopyr + bispyribac-sodium	0.38 0.133	PREFL	100	98	92	25	95	100
Bispyribac-sodium	0.133	EPOST	100	96	90	30	8	98
LSD (0.05)			NS	NS	NS	NS	34	NS

Table 58. Triclopyr (Grandstand) tank mixes, Lonoke, 1999.

TEST INFORMATION

Location	Lonoke	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 17, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Bengal
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.3 / 5.1		

Comments: PRE = preemergence; 2-3 LF = 2-3 leaf cotton; and PI = panicle initiation. Intermittent light rain occurred during spraying of 2-3 LF applications.

Application type	PRE	2-3 LF	PI
Date applied	5/11/99	6/2/99	7/8/99
Time	6:40 am	9:15 am	9:15 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	79 / 72	73 / 68	84 / 80
Relative humidity (%)	65	82	76
Wind (mph)	4	0	3
Weather	partly cloudy	cloudy	mostly clear
Soil moisture	dry	saturated	flooded
Crop stage/Height	N/A	2-3 lf / 8"	PI / 36"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	16 / 6 / 20	18 / 6 / 20	12 / 6 / 20
Gpa / Psi	10 / 21	10 / 18	10 / 11
Weed species	----- (# leaves/height) -----		
MOLVE	N/A	7 lf	N/A
CYPIR	N/A	4 lf / 1"	N/A
BRAPP	NA	4 lf / 2"	Boot / 18"
S-ECHCG	N/A	N/A	heading / 3"
R-ECHCG	N/A	N/A	heading / 3"

Conclusions: Triclopyr was found to be a good tank-mix partner with propanil and propanil combinations for broadleaf signalgrass control. Barnyardgrass control was higher when these herbicides were used in conjunction with a preemergence herbicide.

Table 58. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Broadleaf signalgrass (BRAPP)			Barnyardgrass (ECHCG)				
			6/16	7/12	8/2	Resistant		Susceptible		
			6/16	7/12	8/2	6/16	7/12	7/12	8/2	
			----- (%) -----							
Untreated check			0	0	0	0	0	0	0	0
Triclopyr + propanil	0.19 3.0	2-3 LF	59	100	100	50	0	68	0	0
Triclopyr + (propanil + molinate)	0.19 4.5	2-3 LF	58	100	100	45	0	38	0	0
Triclopyr + propanil + pendimethalin	0.19 3.0 1.0	2-3 LF	70	100	100	61	78	78	74	74
Triclopyr + (propanil + molinate) + pendimethalin	0.19 4.5 1.0	2-3 LF	88	100	100	73	90	99	90	90
Triclopyr + propanil + quinclorac	0.19 4.5 0.25	2-3 LF	94	100	100	83	96	96	93	93
Triclopyr + (propanil + molinate) + quinclorac	0.19 4.5 0.25	2-3 LF	94	100	100	85	98	95	90	90
Triclopyr + propanil + thiobencarb	0.19 3.0 3.0	2-3 LF	75	100	100	69	58	80	75	75
Triclopyr + (propanil + molinate) + thiobencarb	0.19 4.5 3.0	2-3 LF	74	100	100	68	63	80	76	76
Triclopyr + propanil + halosulfuron	0.19 3.0 0.047	2-3 LF	61	100	100	43	0	38	0	0
Propanil + pendimethalin	3.0 1.0	2-3 LF	76	100	100	60	40	80	69	69
Propanil <i>fb</i> triclopyr + bispyribac-sodium + Kinetic (0.25%)	3.0 0.25 0.02	2-3 LF PI	64	100	100	43	0	38	29	29
Propanil <i>fb</i> triclopyr + carfentrazone + AG-98 (0.25%)	3.0 0.25 0.01 3.0	2-3 LF PI	53	100	100	44	0	28	0	0

continued

Table 58. Section 1. Continued

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Broadleaf signalgrass (BRAPP)			Barnyardgrass (ECHCG)				
			6/16	7/12	8/2	Resistant		Susceptible		
			6/16	7/12	8/2	6/16	7/12	7/12	8/2	
			----- (%) -----							
Propanil <i>fb</i>	3.0	2-3 LF								
triclopyr +	0.25									
acifluorfen +	0.12									
AG-98 (0.25%)		PI	64	100	100	45	0	46	0	
Triclopyr +	0.19									
propanil <i>fb</i>	3.0	2-3 LF								
triclopyr +	0.25									
propanil	3.0	PI	71	100	100	54	0	65	19	
Clomazone <i>fb</i>	0.4	PRE								
triclopyr +	0.25									
propanil	3.0	2-3 LF	75	100	100	90	98	99	98	
Clomazone <i>fb</i>	0.4	PRE								
triclopyr +	0.25									
(propanil + molinate)	4.5	2-3 LF	74	100	100	91	100	99	99	
LSD (0.05)			14	1	1	12	24	23	20	

continued

Table 58. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control			
			Hemp sesbania (SEBEX)	Northern jointvetch (AESVI)	Entireleaf morningglory (IPOHG)	Rice flatsedge (CYPPIR)
			6/16	6/16	6/16	6/16
			----- (%) -----			
Untreated check			0	0	0	0
Triclopyr +	0.19					
propanil	3.0	2-3 LF	30	88	58	99
Triclopyr +	0.19					
(propanil + molinate)	4.5	2-3 LF	50	55	58	98
Triclopyr +	0.19					
propanil +	3.0					
pendimethalin	1.0	2-3 LF	66	45	68	98
Triclopyr +	0.19					
(propanil + molinate) +	4.5					
pendimethalin	1.0	2-3 LF	73	69	84	50

continued

Table 58. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control			
			Hemp sesbania (SEBEX)	Northern jointvetch (AESVI)	Entireleaf morningglory (IPOHG)	Rice flatsedge (CYPIR)
			6/16	6/16	6/16	6/16
			----- (%) -----			
Triclopyr + propanil + quinclorac	0.19 4.5 0.25	2-3 LF	98	98	98	99
Triclopyr + (propanil + molinate) + quinclorac	0.19 4.5 0.25	2-3 LF	99	95	99	99
Triclopyr + propanil + thiobencarb	0.19 3.0 3.0	2-3 LF	73	58	98	99
Triclopyr + (propanil + molinate) + thiobencarb	0.19 4.5 3.0	2-3 LF	74	73	83	99
Triclopyr + propanil + halosulfuron	0.19 3.0 0.047	2-3 LF	85	95	85	100
Propanil + pendimethalin	3.0 1.0	2-3 LF	55	94	85	70
Propanil <i>fb</i> triclopyr + bispyribac-sodium + Kinetic (0.25%)	3.0 0.25 0.02	2-3 LF PI	45	60	36	83
Propanil <i>fb</i> triclopyr + carfentrazone + AG-98 (0.25%)	3.0 0.25 0.01	2-3 LF PI	80	55	75	94
Propanil <i>fb</i> triclopyr + acifluorfen + AG-98 (0.25%)	3.0 0.25 0.12	2-3 LF PI	56	55	74	65
Triclopyr + propanil <i>fb</i> triclopyr + propanil	0.19 3.0 0.25 3.0	2-3 LF PI	70	55	98	85
Clomazone <i>fb</i> triclopyr + propanil	0.4 0.25 3.0	PRE 2-3 LF	49	59	61	100

continued

Table 58. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control			
			Hemp sesbania (SEBEX)	Northern jointvetch (AESVI)	Entireleaf morningglory (IPOHG)	Rice flatsedge (CYPIR)
			6/16	6/16	6/16	6/16
			----- (%) -----			
Clomazone <i>fb</i>	0.4	PRE				
triclopyr +	0.25					
(propanil + molinate)	4.5	2-3 LF	71	94	100	100
LSD (0.05)			49	42	46	27

continued

Table 58. Section 3.

Herbicide	Rate (lb/A)	Application timing	Sprangletop (LEFPA) control	Effect on rice			Yield (lb/A)
			6/16	Injury			
			6/16	5/26	6/16	7/12	
			----- (%) -----				
Untreated check			0	0	0	0	2610
Triclopyr +	0.19						
propanil	3.0	2-3 LF	100	0	4	0	6255
Triclopyr +	0.19						
(propanil + molinate)	4.5	2-3 LF	100	0	1	0	5130
Triclopyr +	0.19						
propanil +	3.0						
pendimethalin	1.0	2-3 LF	100	0	8	0	6480
Triclopyr +	0.19						
(propanil + molinate)	4.5						
+ pendimethalin	1.0	2-3 LF	100	0	11	0	7110
Triclopyr +	0.19						
propanil +	4.5						
quinclorac	0.25	2-3 LF	100	0	8	0	6930
Triclopyr +	0.19						
(propanil + molinate)	4.5						
+ quinclorac	0.25	2-3 LF	100	0	9	0	6840
Triclopyr +	0.19						
propanil +	3.0						
thiobencarb	3.0	2-3 LF	100	0	10	0	6885
Triclopyr +	0.19						
(propanil + molinate)	4.5						
+ thiobencarb	3.0	2-3 LF	100	0	11	0	6885

continued

Table 58. Section 3. Continued.

Herbicide	Rate (lb/A)	Application timing	Sprangletop	Effect on rice			Yield 9/17 (lb/A)
			(LEFPA) control	Injury			
			6/16	5/26	6/16	7/12	
				----- (%) -----			
Triclopyr + propanil + halosulfuron	0.19 3.0 0.047	2-3 LF	100	0	8	0	5265
Propanil + pendimethalin	3.0 1.0	2-3 LF	100	0	4	0	5490
Propanil <i>fb</i> triclopyr + bispyribac-sodium + Kinetic (0.25%)	3.0 0.25 0.02	2-3 LF PI	100	0	4	0	5760
Propanil <i>fb</i> triclopyr + carfentrazone + AG-98 (0.25%)	3.0 0.25 0.01	2-3 LF PI	100	0	6	3	5400
Propanil <i>fb</i> triclopyr + acifluorfen + AG-98 (0.25%)	3.0 0.25 0.12	2-3 LF PI	100	0	9	9	5580
Triclopyr + propanil <i>fb</i> triclopyr + propanil	0.19 3.0 0.25 3.0	2-3 LF PI	100	0	10	4	5625
Clomazone <i>fb</i> triclopyr + propanil	0.4 0.25 3.0	PRE 2-3 LF	100	10	18	0	6885
Clomazone <i>fb</i> triclopyr + (propanil + molinate)	0.4 0.25 4.5	PRE 2-3 LF	100	13	19	0	6660
LSD (0.05)			NS	1	7	2	1080

Table 59. Reduced rate study with triclopyr (Grandstand) and propanil (Stam M-4), Lonoke, 1999.

TEST INFORMATION

Location	Lonoke	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 17, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Bengal
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.4 / 4.8		

Comments: 2-3 LF = 2-3 leaf rice; 3-4 LF = 3-4 leaf rice; and PI = panicle initiation.

	2-3 LF	3-4 LF	PI
Application type	2-3 LF	3-4 LF	PI
Date applied	6/1/99	6/4/99	7/8/99
Time	10:15 am	4:15 pm	9:00 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	88 / 68	92 / 86	84 / 80
Relative humidity (%)	72	45	76
Wind (mph)	0	4	3
Weather	cloudy	cloudy	clear
Soil moisture	damp	dry	flooded
Crop stage/Height	3 lf / 6"	3 lf / 8"	PI / 3"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	18 / 6 / 20	20 / 6 / 20	12 / 6 / 20
Gpa / Psi	10 / 18	10 / 21	10 / 11
Weed species	----- [# leaves/height (in.)] -----		
BRAPP	5 lf / 2"	3-6 lf / 3"	boot / 18"
MOLVE	5 lf /	12 lf / 0.5"	N/A
CYPIR	4 lf / 1"	4 lf / 1"	N/A
S-ECHCG	N/A	N/A	heading / 3"
R-ECHCG	N/A	N/A	heading / 3"

Conclusions: Very little rice injury resulted from the triclopyr (Grandstand) treatments. However, the design of the protocol did not allow for acceptable grass control in any of the treatments, so yields were low.

Table 59. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Broadleaf signalgrass (BRAPP)			Barnyardgrass (ECHCG)				Hemp sesbania (SEBEX)
			6/16	7/12	8/2	Resistant		Susceptible		
						6/16	7/12	7/12	8/2	6/16
			----- (%) -----							
Untreated check			0	0	0	0	0	0	0	0
Triclopyr + AG-98 (0.25%)	0.25	3-4 LF	0	0	25	40	0	10	0	91
Triclopyr + propanil	0.19 4.0	2-3 LF	73	100	100	46	0	43	15	84
Triclopyr + (propanil + molinate)	0.19 4.0	2-3 LF	61	100	100	53	0	60	61	59
Triclopyr + propanil	0.25 4.0	3-4 LF	66	100	100	43	0	33	16	90
Triclopyr + propanil <i>fb</i>	0.19 4.0	2-3 LF								
triclopyr + propanil	0.25 1.0	PI	53	100	100	53	0	53	30	90
Triclopyr + propanil <i>fb</i>	0.25 4.0	3-4 LF								
triclopyr + propanil	0.25 1.0	PI	0	100	100	45	0	53	48	90
Triclopyr + AG-98 (0.25%)	0.25	PI	0	0	0	0	0	0	0	0
Triclopyr + AG-98 (0.25%)	0.38	PI	0	0	0	0	0	0	0	0
Triclopyr + propanil	0.25 1.0	PI	0	0	0	0	0	0	0	0
Triclopyr + propanil	0.38 1.0	PI	0	0	0	0	0	0	0	0
Triclopyr + (propanil + molinate)	0.25 1.0	PI	0	0	0	0	0	0	0	0
Propanil	1.0	PI	0	0	0	0	0	0	0	0
LSD (0.05)			7	1	19	6	NS	15	22	11

continued

Table 59. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control			Effect on rice		
			Northern jointvetch (AESVI)	Pitted morningglory (IPOLA)	Rice flatsedge (CYPPIR)	Injury		Yield
			6/16	6/16	6/16	6/16	8/2	9/17
			----- (%) -----			-----		(lb/A)
Untreated check			0	0	0	0	0	2520
Triclopyr + AG-98 (0.25%)	0.25	3-4 LF	0	91	0	11	0	5310
Triclopyr + propanil	0.19 4.0	2-3 LF	0	88	94	5	0	5580
Triclopyr + (propanil + molinate)	0.19 4.0	2-3 LF	0	84	95	8	0	4590
Triclopyr + propanil	0.25 4.0	3-4 LF	0	93	73	13	0	5220
Triclopyr + propanil <i>fb</i> triclopyr + propanil	0.19 4.0 0.25 1.0	2-3 LF PI	0	91	91	1	0	5310
Triclopyr + propanil <i>fb</i> triclopyr + propanil	0.25 4.0 0.25 1.0	3-4 LF PI	0	90	70	13	0	1980
Triclopyr + AG-98 (0.25%)	0.25	PI	0	0	0	0	0	2475
Triclopyr + AG-98 (0.25%)	0.38	PI	0	0	0	0	0	3150
Triclopyr + propanil	0.25 1.0	PI	0	0	0	0	0	2970
Triclopyr + propanil	0.38 1.0	PI	0	0	0	0	0	3150
Triclopyr + (propanil + molinate)	0.25 1.0	PI	0	0	0	0	0	2880
Propanil	1.0	PI	0	0	0	0	0	2205
LSD (0.05)			NS	6	13	3	NS	810

Table 60. Propanil (Stam) combinations for weed control, Lonoke, 1999.**TEST INFORMATION**

Location	Lonoke	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 20, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Wells
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.4 / 4.8		

Comments: Propanil-resistant barnyardgrass, entireleaf morningglory, hemp sesbania, and northern jointvetch were planted in rows across the plots. 3-4 LF = 3-4 leaf rice.

Application type	3-4 LF
Date applied	6/2/99
Time	4:40 pm
Incorporation equipment	N/A
Air/Soil temperature (F)	93 / 80
Relative humidity (%)	63
Wind (mph)	3
Weather	partly cloudy
Soil moisture	damp
Crop stage/Height	3 lf / 9"
Sprayer type/mph	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	19 / 6 / 20
Gpa / Psi	10 / 13
Weed species	[# leaves/height (in.)]
BRAPP	3 lf / 4"
MOLVE	6 lf /
CYPIR	3 lf / 1.5"
R-ECHCG	3 lf / 3.5"
IPOHG	3 lf / 5"
SEBEX	3 lf / 5"
AESVI	3 lf / 5"

Conclusions: This short protocol evaluates propanil alone and in combination with other popular herbicides. Data for propanil-resistant (R-ECHCG) barnyardgrass and other weeds are shown.

Table 60. Section 1.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass (ECHCG) control							
			Resistant				Susceptible			
			6/9	6/17	7/7	7/28	6/9	6/17	7/7	7/28
			----- (%) -----							
Untreated check			0	0	0	0	0	0	0	0
Propanil	4.0	3-4 LF	25	0	0	0	58	80	50	41
(Propanil + molinate)	6.0	3-4 LF	43	20	0	0	65	83	59	54
Propanil + quinclorac	4.0 0.125	3-4 LF	84	90	95	93	100	100	95	98
Propanil + quinclorac	4.0 0.25	3-4 LF	94	100	95	100	100	100	95	100
Propanil + bispyribac-sodium + Kinetic (0.125%)	4.0 0.02	3-4 LF	68	55	39	20	68	89	71	74
Propanil + pendimethalin	4.0 1.0	3-4 LF	64	33	28	8	66	84	73	71
LSD (0.05)			22	32	19	11	11	15	14	16

continued

Table 60. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Broadleaf signalgrass (BRAPP)			Hemp sesbania (SEBEX)	Northern jointvetch (AESVI)	Entireleaf morningglory (IPOHG)
			6/9	7/7	7/28	6/9	7/7	6/9
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Propanil	4.0	3-4 LF	98	98	100	100	100	88
(Propanil + molinate)	6.0	3-4 LF	100	100	100	98	100	54
Propanil + quinclorac	4.0 0.125	3-4 LF	100	100	100	100	90	100
Propanil + quinclorac	4.0 0.25	3-4 LF	100	100	100	98	100	100
Propanil + bispyribac-sodium + Kinetic (0.125%)	4.0 0.019	3-4 LF	100	100	100	98	100	81
Propanil + pendimethalin	4.0 1.0	3-4 LF	100	100	100	93	100	94
LSD (0.05)			3	3	1	9	11	25

continued

Table 60. Section 3.

Herbicide	Rate (lb/A)	Application timing	Effect on rice		Yield (lb/A)
			Injury		
			7/7	7/28	
			----- (%) -----		
Untreated check			0	0	3195
Propanil	4.0	3-4 LF	9	0	7155
(Propanil + molinate)	6.0	3-4 LF	5	0	7425
Propanil + quinclorac	4.0 0.125	3-4 LF	13	0	6840
Propanil + quinclorac	4.0 0.25	3-4 LF	6	0	8910
Propanil + bispyribac-sodium + Kinetic (0.125%)	4.0 0.019	3-4 LF	4	0	7245
Propanil + pendimethalin	4.0 1.0	3-4 LF	6	0	7695
LSD (0.05)			11	NS	1935

Table 61. Propanil (Super Wham) plus Ricestar (fenoxaprop + safener), Lonoke, 1999.

TEST INFORMATION

Location	Lonoke	Planting date	May 12, 1999
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	10 ft by 20 ft	Crop / Variety	Rice / 93AS3510
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.4 / 4.8		

Comments: PREFL = pre flood.

Application type	PREFL
Date applied	6/14/99
Time	11:00 am
Incorporation equipment	N/A
Air/Soil temperature (F)	82 / 76
Relative humidity (%)	68
Wind (mph)	6
Weather	cloudy
Soil moisture	moist
Crop stage/Height	2 tiller / 11"
Sprayer type/mph	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	24 / 6 / 20
Gpa / Psi	10 / 28
Weed species	[# leaves/height (in.)]
BRAPP	2 tiller / 11"
MOLVE	flowering / 4.5"
CYPIR	5 lf / 4.5"
ECLAL	4-5 lf / 3"

Conclusions: This study evaluates fenoxaprop + safener (Ricestar) alone and in combination with propanil (Super Wham). Broadleaf signalgrass control was excellent with all treatments. However, barnyardgrass was not effectively controlled.

Table 61.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Broadleaf signalgrass (BRAPP)		Rice flatsedge (CYPIR)	Barnyardgrass (ECHCG)		Hemp sesbania (SEBEX)	Rice injury	
			7/12	8/2	7/12	7/12	8/2	8/2	7/12	8/2
Untreated check			0	0	0	0	0	0	0	0
Propanil + Penetrator Plus (1 pt/A) (fenoxaprop + safener)	4.0 0.063	PREFL	100	93	100	40	16	100	0	0
Propanil + Penetrator Plus (1 pt/A) <i>fb</i> (fenoxaprop + safener)	4.0 0.031	PREFL	100	95	100	34	8	100	0	0
Propanil + Penetrator Plus (1 pt/A) <i>fb</i> (fenoxaprop + safener)	4.0 0.015	PREFL	100	95	100	35	10	100	0	0
Propanil + Penetrator Plus (1 pt/A) <i>fb</i> (fenoxaprop + safener)	2.0 0.047	PREFL	100	95	100	30	0	100	0	0
Propanil + Penetrator Plus (1 pt/A) <i>fb</i> (fenoxaprop + safener)	2.0 0.063	PREFL	100	95	100	33	5	100	0	0
Propanil + Penetrator Plus (1 pt/A) <i>fb</i> (fenoxaprop + safener)	3.0 0.047	PREFL	100	95	100	35	8	100	0	0
LSD (0.05)			1	2	15	12	23	6	NS	NS

Table 62. Propanil formulations and adjuvants, Lonoke, 1999.

TEST INFORMATION

Location	Lonoke	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 17, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Bengal
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.3 / 5.1		

Comments: 3-4 LF = 3-4 leaf cotton; and 5-6 LF = 5-6 leaf cotton.

Application type	3-4 LF	5-6 LF
Date applied	6/2/99	6/9/99
Time	3:25 pm	6:25 pm
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	93 / 72	93 / 80
Relative humidity (%)	61	41
Wind (mph)	1	4
Weather	mostly cloudy	partly cloudy
Soil moisture	moist	moist
Crop stage/Height	4 lf / 7"	1 tiller / 12"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	18 / 6 / 20	22 / 6 / 20
Gpa / Psi	10 / 18	10 / 15
Weed species	----- (# leaves/height) -----	
BRAPP	5 lf / 2.5"	1 tiller / 5"
MOLVE	5 lf	N/A
CYPIR	4 lf / 2.5"	4 lf / 1"

Conclusions: No large differences were noted in grass control and rice yield. The TRA 0155 seemed more difficult to spray.

Table 62. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Broadleaf signalgrass (BRAPP)			Barnyardgrass (ECHCG)		
			6/16	7/12	8/2	6/16	7/12	8/2
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Propanil + Prime oil (1 qt/A)	3.0	3-4 LF	74	100	89	63	53	39
Propanil + Prime oil (1 pt/A) + TRA 0155 (9 lb/100 gal)	3.0	3-4 LF	56	95	89	56	53	20
Propanil + Prime oil (1 pt/A) + TRA 0255 (2.5 gal/100 gal)	3.0	3-4 LF	69	100	94	63	55	51
Propanil + Prime oil (1 qt/A)	3.0	5-6 LF	43	63	26	43	53	39
Propanil + Prime oil (1 pt/A) + TRA 0155 (9 lb/100 gal)	3.0	5-6 LF	41	38	33	41	53	15
Propanil + Prime oil (1 pt/A) + TRA 0255 (2.5 gal/100 gal)	3.0	5-6 LF	39	41	20	41	50	15
LSD (0.05)			7	41	38	10	20	32

continued

Table 62. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control		Effect on rice		
			Rice flatsedge (CYPPIR)	Carpetweed (MOLVE)	Injury		Yield
			6/16	6/16	6/16	8/2	9/17
Untreated check			0	0	0	0	3285
Propanil + Prime oil (1 qt/A)	3.0	3-4 LF	74	100	0	0	5040
Propanil + Prime oil (1 pt/A) + TRA 0155 (9 lb/100 gal)	3.0	3-4 LF	61	100	0	0	4590
Propanil + Prime oil (1 pt/A) + TRA 0255 (2.5 gal/100 gal)	3.0	3-4 LF	70	100	0	0	4545
Propanil + Prime oil (1 qt/A)	3.0	5-6 LF	43	68	1	0	4815
Propanil + Prime oil (1 pt/A) + TRA 0155 (9 lb/100 gal)	3.0	5-6 LF	43	66	1	0	4590
Propanil + Prime oil (1 pt/A) + TRA 0255 (2.5 gal/100 gal)	3.0	5-6 LF	39	65	1	0	4320
LSD (0.05)			8	8	2	0	990

Table 63. Fenoxaprop + safener (Ricestar) in sequences and mixtures for weed control in rice, Stuttgart, 1999.**TEST INFORMATION**

Location	Stuttgart	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 16, 1999
Plot size	6 ft by 16 ft	Crop / Variety	Rice / Drew (Vitavax & Icon Trt.)
Row width / Number of rows per plot	6.5 in. / 9 rows	Dates of flushing	May 16, 25, and June 9, 1999
Soil type	Dewitt silt loam (8% sand, 75% silt, 16% clay)	Date of flooding	June 21, 1999
% OM / pH	1 / 5.4		

Comments: DPRE = delayed preemergence; EPOST = early postemergence; and PREFL = pre-flood. Yield is adjusted to 12% moisture.

Application type	DPRE	EPOST	PREFL
Date applied	5/18/99	6/2/99	6/18/99
Time	7:30 pm	1:30 pm	8:00 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	70 / 75	82 / 86	69 / 70
Relative humidity (%)	72	82	66
Wind (mph)	2	1	4
Weather	clear	partly cloudy	clear
Soil moisture	moist	wet	moist
Crop stage/Height	N/A	2-3 lf / 6"	4-7 lf / 11"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Turbo TJ / 110015	Teejet XR / 11001 VS	Teejet XR / 11001 VS
Boom ht / # Noz / Spacing (in.)	15 / 3 / 18	15 / 3 / 18	14 / 3 / 18
Gpa / Psi	10 / 22	10 / 41	10 / 42
Weed species (density)	-----	[# leaves/height (in.)]	-----
R-ECHCG (14-29/row ft)	N/A	2-3 lf / 0.5-1"	5-7 lf, 2 tiller / 8-10"
ECHCG (28/ft ²)	N/A	2 lf / 0.5-0.75"	4-6 lf, 2 tiller / 6-8"
BRAPP (4-8/ft ²)	N/A	3 lf / 3.5"	6-9 lf, 3 tiller / 4-6"

Conclusions: Sequential herbicide programs with fenoxaprop + safener provided excellent control of broadleaf signalgrass and propanil-resistant and -susceptible barnyardgrass. Greater yields were collected from rice treated with fenoxaprop + safener when used sequentially with other herbicides, with exception of pendimethalin followed by fenoxaprop + safener and triclopyr, which resulted in the highest injury (18%).

Table 63. Section 1.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass control							
			Resistant (R-ECHCG)				Susceptible (ECHCG)			
			6/9	6/17	6/29	7/28	6/9	6/17	6/29	7/28
			----- (%) -----							
Untreated check			0	0	0	0	0	0	0	0
(Fenoxaprop + safener) <i>fb</i>	0.098	EPOST								
(fenoxaprop + safener)	0.134	PREFL	94	98	96	97	99	98	96	96
Propanil (Stam M-4) <i>fb</i>	4.0	EPOST								
(fenoxaprop + safener)	0.134	PREFL	14	11	34	34	85	96	91	88
Quinclorac + Agri-Dex (1%) <i>fb</i>	0.25	EPOST								
(fenoxaprop + safener)	0.134	PREFL	91	92	87	85	93	98	96	91
Pendimethalin <i>fb</i>	1.0	DPRE								
(fenoxaprop + safener)	0.134	PREFL	100	97	98	96	99	97	98	92
Clomazone <i>fb</i>	0.4	DPRE								
(fenoxaprop + safener)	0.134	PREFL	98	99	98	100	100	99	98	100
Pendimethalin <i>fb</i>	1.0	DPRE								
(fenoxaprop + safener)	0.134									
+ triclopyr	0.375	PREFL	100	95	97	96	99	97	98	91
Pendimethalin <i>fb</i>	1.0	DPRE								
(fenoxaprop + safener)	0.134									
+ carfentrazone	0.02	PREFL	98	96	97	93	99	97	98	94
LSD (0.05)			5	6	6	9	6	4	5	6

continued

Table 63. Section 2.

Herbicide	Rate (lb/A)	Application timing	Broadleaf signalgrass		Effect on rice				Yield 9/16 (lb/A)
			(BRAPP) control		Injury				
			6/9	6/17	6/9	6/17	6/29	7/28	
Untreated check			0	0	0	0	0	0	4080
(Fenoxaprop + safener) <i>fb</i>	0.098	EPOST							
(fenoxaprop + safener)	0.134	PREFL	100	98	0	0	1	0	6397
Propanil (Stam M-4) <i>fb</i>	4.0	EPOST							
(fenoxaprop + safener)	0.134	PREFL	88	99	0	0	1	0	6683
Quinclorac + Agri-Dex (1%) <i>fb</i>	0.25	EPOST							
(fenoxaprop + safener)	0.134	PREFL	99	98	0	0	13	0	7496
Pendimethalin <i>fb</i>	1.0	DPRE							
(fenoxaprop + safener)	0.134	PREFL	99	97	3	0	9	0	7150
Clomazone <i>fb</i>	0.4	DPRE							
(fenoxaprop + safener)	0.134	PREFL	99	99	4	0	3	0	6755
Pendimethalin <i>fb</i>	1.0	DPRE							
(fenoxaprop + safener)	0.134								
+ triclopyr	0.375	PREFL	98	96	0	0	18	0	6527
Pendimethalin <i>fb</i>	1.0	DPRE							
(fenoxaprop + safener)	0.134								
+ carfentrazone	0.02	PREFL	100	96	0	0	9	0	7573
LSD (0.05)			5	3	2	NS	6	NS	995

Table 64. Evaluation of CGA 279233 in rice, Stuttgart, 1999.

TEST INFORMATION

Location	Stuttgart	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 15, 1999
Plot size	6 ft by 16 ft	Crop / Variety	Rice / Drew (Vitavax + Icon Trt.)
Row width / Number of rows per plot	6.5 in. / 9 rows	Dates of flushing	May 16, 25, and June 9, 1999
Soil type	Dewitt silt loam (3% sand, 83% silt, 14% clay)	Date of flooding	June 21, 1999
% OM / pH	1 / 5.4		

Comments: PRE = preemergence; DPRE = delayed preemergence; 2-lf = 2 leaf rice; EPOST = early postemergence; PREFL = pre-flood. EPOST treatments had a trace of rain 1 to 2 hours after application. Yield is adjusted to 12% moisture.

Application type	PRE	DPRE	2 LF	EPOST	PREFL
Date applied	5/12/99	5/18/99	5/25/99	6/2/99	6/18/99
Time	8:00 pm	7:30 pm	3:00 pm	2:00 pm	8:00 am
Incorporation equipment	N/A	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	78 / 76	70 / 75	80 / 80	82 / 86	69 / 70
Relative humidity (%)	62	72	74	82	66
Wind (mph)	1	2	3	1	4
Weather	mostly clear	clear	cloudy	partly cloudy	
Soil moisture	moist	moist	dry	wet	moist
Crop stage/Height	N/A	N/A	2 lf / 3"	2-3 lf / 6"	4-7 lf, 2 tiller / 10"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Turbo TJ / 110015	Turbo TJ / 11001 VS	Teejet XR / 11001 VS	Teejet XR / 11001 VS	Teejet XR /
Boom ht / # Noz / Spacing (in.)	15 / 3 / 18	14 / 3 / 18	15 / 3 / 18	14 / 3 / 18	14 / 3 / 18
Gpa / Psi	10 / 22	10 / 23	10 / 41	10 / 42	10 / 42
Weed species (density)	----- [# leaves/height (in.)] -----				
R-ECHCG (15-30/row ft)	N/A	N/A	1-2 lf / 0.25-0.5"	2-3 lf / 0.5-1.5"	4-7 lf, 2 tiller / 8-10"
ECHCG (15-30/ft ²)	N/A	N/A	1 lf / 0.25"	2 lf / 0.5-0.75"	4-6 lf, 2 tiller / 6-8"
BRAPP (2-4/ft ²)	N/A	N/A	2 lf / 0.4"	3 lf / 3.5"	6-9 lf, 3 tiller / 4-7"

Conclusions: PRE and DPRE applications of CGA 279233 A10007A were most effective for the control of resistant and susceptible barnyardgrass and broadleaf signalgrass. The CGA 279233 (1.67 SC) was more effective applied postemergence than CGA 279233 A10007A. There was little crop response to either compound. Rice yields were generally greater when CGA 279233 A10007A was applied PRE or DPRE than when applied at 2- to 3-leaf rice.

Table 64. Section 1.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass control							
			Resistant (R-ECHCG)				Susceptible (ECHCG)			
			6/9	6/17	6/29	7/28	6/9	6/17	6/29	7/28
			----- (%) -----							
Untreated check			0	0	0	0	0	0	0	0
CGA 279233 A10007A	0.268	PRE	98	93	98	96	98	93	99	96
CGA 279233 A10007A + pendimethalin + Agri-Dex (0.25%)	0.268 0.5	DPRE	98	94	99	99	100	94	100	99
CGA 279233 A10007A + Agri-Dex (0.25%)	0.268	DPRE	100	95	100	98	100	95	99	98
CGA 279233 A10007A + Agri-Dex (0.25%)	0.268	2-If	83	79	78	59	97	89	95	87
CGA 279233 + Agri-Dex (0.25%)	0.268	2-If	97	85	91	93	98	91	97	93
CGA 279233 A10007C + Agri-Dex (0.25%)	0.268	2-If	88	82	80	56	97	91	97	91
CGA 279233 A10007C + propanil (Stam M-4)	0.268 2.0	2-If	84	75	58	51	95	85	89	91
Propanil (Stam M-4) <i>fb</i> propanil (Stam M-4)	2.0 3.0	2-If PREFL	14	13	13	5	85	80	75	46
CGA 279233 A10007A <i>fb</i> propanil (Stam M-4)	0.232 3.0	PRE PREFL	97	91	96	96	99	93	99	93
(Fenoxaprop + safener) <i>fb</i> propanil (Stam M-4)	0.161 3.0	EPOST PREFL	94	93	97	99	95	93	99	98
Pendimethalin	0.5	DPRE	90	88	88	83	99	91	88	85
LSD (0.05)			4	8	8	10	4	4	4	7

continued

Table 64. Section 2.

Herbicide	Rate (lb/A)	Application timing	Broadleaf signalgrass	Effect on rice				Yield 9/15 (lb/A)
			(BRAPP) control	Injury				
			6/9	6/9	6/29	7/7	7/29	
Untreated check			0	0	0	0	0	2507
CGA 279233 A10007A	0.268	PRE	100	0	0	0	0	7169
CGA 279233 A10007A + pendimethalin + Agri-Dex (0.25%)	0.268 0.5	DPRE	100	0	3	0	0	6934
CGA 279233 A10007A + Agri-Dex (0.25%)	0.268	DPRE	100	0	5	0	0	6917
CGA 279233 A10007A + Agri-Dex (0.25%)	0.268	2-lf	98	0	3	0	0	6253
CGA 279233 + Agri-Dex (0.25%)	0.268	2-lf	99	0	5	0	0	6946
CGA 279233 A10007C + Agri-Dex (0.25%)	0.268	2-lf	97	0	4	0	0	6336
CGA 279233 A10007C + propanil (Stam M-4)	0.268 2.0	2-lf	99	0	0	0	0	6479
Propanil (Stam M-4) <i>fb</i> propanil (Stam M-4)	2.0 3.0	2-lf PREFL	83	0	0	0	0	4199
CGA 279233 A10007A <i>fb</i> propanil (Stam M-4)	0.232 3.0	PRE PREFL	100	0	13	0	0	6562
(Fenoxaprop + safener) <i>fb</i> propanil (Stam M-4)	0.161 3.0	EPOST PREFL	100	0	10	0	0	6543
Pendimethalin	0.5	DPRE	95	0	0	0	0	5850
LSD (0.05)			5	NS	5	NS	NS	657

Table 65. Midseason control of broadleaved weeds with carfentrazone, Stuttgart, 1999.**TEST INFORMATION**

Location	Stuttgart	Planting date	May 18, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 16, 1999
Plot size	6 ft by 16 ft	Crop / Variety	Rice / Drew (Vitavax + Icon Trt.)
Row width / Number of rows per plot	6.5 in. / 9 rows	Dates of flushing	May 25 and June 9, 1999
Soil type	Dewitt silt loam (3% sand, 83% silt, 14% clay)	Date of flooding	June 21, 1999
% OM / pH	1 / 5.4		

Comments: POFL = postflood. Yield is adjusted to 12% moisture.

Application type	POFL
Date applied	7/7/99
Time	2:00 pm
Incorporation equipment	N/A
Air/Soil temperature (F)	90 / 85
Relative humidity (%)	85
Wind (mph)	2
Weather	clear
Soil moisture	flooded
Crop stage/Height	7 lf / 19"
Sprayer type/mph	BkPkCO ₂ / 3
Nozzle type/Size	Turbo TJ / 80015XR
Boom ht / # Noz / Spacing (in.)	15 / 3 / 18
Gpa / Psi	10 / 28
Weed species (density)	[# leaves/height (in.)]
SEBEX (6/ft)	10-14 lf / 36-45"
IPOLA (4/ft)	25-30 lf / 20-24"

Conclusions: Midseason hemp sesbania control was limited to carfentrazone at 0.02 and 0.03 lb ai/A and acifluorfen at 0.125 lb ai/A. Pitted morningglory control was limited to triclopyr applied at 0.25 lb ai/A, with inadequate control achieved by carfentrazone and acifluorfen. Overall no significant differences were detected in yield, with unacceptable yields observed due to early season competition with hemp sesbania.

Table 65.

Herbicide	Rate (lb/A)	Application timing	Weed control						Effect on rice			
			Hemp sesbania (SEBEX)			Pitted morningglory (IPOLA)			Injury			Yield
			7/13	7/29	8/13	7/29	8/13	7/13	7/29	8/13	9/16	
			----- (%) -----									(lb/A)
Untreated check			0	0	0	0	0	0	0	0	965	
Carfentrazone + AG-98 (0.25%)	0.02	POFL	81	99	100	49	30	0	0	0	2697	
Carfentrazone + AG-98 (0.25%)	0.03	POFL	81	98	99	40	24	0	0	0	3242	
Acifluorfen + AG-98 (0.25%)	0.125	POFL	79	97	100	36	30	0	0	0	3276	
Triclopyr + AG-98 (0.25%)	0.25	POFL	68	86	73	96	89	0	0	0	3231	
LSD (0.05)			6	4	5	14	10	NS	NS	NS	973	

Table 66. Evaluation of carfentrazone (Aim) in dry-seeded rice, Lonoke, 1999.**TEST INFORMATION**

Location	Lonoke	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 17, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Bengal
Row width / Number of rows per plot	7.5 in. / rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.3 / 5.1		

Comments: PRE = preemergence; 2-3 LF = 2-3 leaf rice; and PREFL = prelood.

Application type	PRE	2-3 LF	PREFL
Date applied	5/11/99	6/2/99	6/9/99
Time	6:40 am	11:10 am	6:55 pm
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	79 / 72	76 / 68	93 / 80
Relative humidity (%)	65	93	41
Wind (mph)	4	0	4
Weather	partly cloudy	cloudy	partly cloudy
Soil moisture	dry	moist	moist
Crop stage/Height	N/A	4 lf / 7"	1 tiller / 12"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	16 / 6 / 20	18 / 6 / 20	21 / 6 / 20
Gpa / Psi	10 / 26	10 / 18	10 / 15
Weed species	-----	[# leaves/height (in.)]	-----
CYPIR	N/A	4 lf / 1"	6 lf / 3.5"
MOLVE	N/A	5 lf	N/A
BRAPP	N/A	N/A	3 lf- 1 tiller / 2-5"

Conclusions: Carfentrazone (Aim) has provided activity on some broadleaf weeds, although moderate rice leaf burn occurred when sprayed on wet foliage. The current formulation (40 DF) is very difficult to get into suspension and settles out very quickly. This results in clogged screens and nozzles, making the herbicide very difficult to apply.

Table 66. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control				Pitted morningglory (IPOLA)	
			Broadleaf signalgrass (BRAPP)				5/26	6/16
			5/26	6/16	7/12	8/2	5/26	6/16
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Clomazone <i>fb</i>	0.4	PRE						
carfentrazone + AG-98 (0.25%) <i>fb</i>	0.02	2-3 LF						
carfentrazone + AG-98 (0.25%)	0.02	PREFL	0	59	95	95	0	100
Clomazone <i>fb</i>	0.4	PRE						
carfentrazone + AG-98 (0.25%)	0.02	2-3 LF	0	59	95	100	50	100
Clomazone <i>fb</i>	0.4	PRE						
carfentrazone + bentazon + AG-98 (0.25%)	0.02 0.75	2-3 LF	0	63	95	100	49	95
Clomazone <i>fb</i>	0.4	PRE						
carfentrazone + (acifluorfen +bentazon) + AG-98 (0.25%)	0.02 0.75	2-3 LF	0	70	95	100	0	95
Clomazone <i>fb</i>	0.4	PRE						
carfentrazone + acifluorfen + AG-98 (0.25%)	0.02 0.125	2-3 LF	0	70	94	100	0	90
Carfentrazone + propanil	0.02 3.0	2-3 LF	0	56	95	100	0	100
Carfentrazone + propanil + thiobencarb	0.02 3.0 4.0	2-3 LF	0	75	95	100	0	94
Carfentrazone + propanil + pendimethalin	0.02 3.0 1.0	2-3 LF	0	58	95	95	0	95
Carfentrazone + (propanil + molinate)	0.02 4.5	2-3 LF	0	77	90	75	0	100
Carfentrazone + quinclorac + AG-98 (0.25%)	0.02 0.375	2-3 LF	0	61	95	98	0	100
Carfentrazone + (fenoxaprop + safener)	0.02 0.045	2-3 LF	0	65	86	95	0	100

continued

Table 66. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Broadleaf signalgrass (BRAPP)				Pitted morningglory (IPOLA)	
			5/26	6/16	7/12	8/2	5/26	6/16
			----- (%) -----					
Carfentrazone + bispyribac-sodium + AG-98 (0.25%)	0.02 0.019	2-3 LF	0	38	39	71	0	68
Clomazone <i>fb</i> carfentrazone + halosulfuron + AG-98 (0.25%)	0.4 0.02 0.047	PRE 2-3 LF	0	75	95	98	0	90
Clomazone <i>fb</i> carfentrazone + bensulfuron + AG-98 (0.25%)	0.4 0.02 0.0625	PRE 2-3 LF	0	70	95	100	0	100
Propanil + quinclorac <i>fb</i> propanil + halosulfuron	4.0 0.25 4.0 0.047	2-3 LF PREFL	0	94	95	100	0	99
LSD (0.05)			NS	16	14	18	29	27

continued

Table 66. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Northern jointvetch (AESVI)	Rice flatsedge (CYPPIR)		Hemp sesbania (SEBEX)		Yellow nutsedge (CYPES)
			6/16	6/16	7/12	6/16	7/12	8/2
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Clomazone <i>fb</i> carfentrazone + AG-98 (0.25%) <i>fb</i> carfentrazone + AG-98 (0.25%)	0.4 0.02 0.02	PRE 2-3 LF PREFL	25	10	79	94	95	25
Clomazone <i>fb</i> carfentrazone + AG-98 (0.25%)	0.4 0.02	PRE 2-3 LF	0	18	79	99	95	75

continued

Table 66. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Northern jointvetch (AESVI)	Rice flatsedge (CYPIR)		Hemp sesbania (SEBEX)		Yellow nutsedge (CYPES)
			6/16	6/16	7/12	6/16	7/12	8/2
			----- (%) -----					
Clomazone <i>fb</i>	0.4	PRE						
carfentrazone +	0.02							
bentazon +	0.75							
AG-98 (0.25%)		2-3 LF	0	98	95	93	95	100
Clomazone <i>fb</i>	0.4	PRE						
carfentrazone +	0.02							
(acifluorfen + bentazon)	0.75							
+ AG-98 (0.25%)		2-3 LF	0	88	95	55	94	100
Clomazone <i>fb</i>	0.4	PRE						
carfentrazone +	0.02							
acifluorfen +	0.125							
AG-98 (0.25%)		2-3 LF	0	60	90	3	95	75
Carfentrazone +	0.02							
propanil	3.0	2-3 LF	100	94	95	100	95	100
Carfentrazone +	0.02							
propanil +	3.0							
thiobencarb	4.0	2-3 LF	66	85	93	56	95	100
Carfentrazone +	0.02							
propanil +	3.0							
pendimethalin	1.0	2-3 LF	88	73	95	75	95	100
Carfentrazone +	0.02							
(propanil + molinate)	4.5	2-3 LF	48	82	93	100	95	75
Carfentrazone +	0.02							
quinclorac +	0.375							
AG-98 (0.25%)		2-3 LF	93	5	95	100	95	25
Carfentrazone +	0.02							
(fenoxaprop + safener)	0.045	2-3 LF	0	0	35	38	95	25
Carfentrazone +	0.02							
bispyribac-sodium +	0.019							
AG-98 (0.25%)		2-3 LF	50	71	95	38	95	75
Clomazone <i>fb</i>	0.4	PRE						
carfentrazone +	0.02							
halosulfuron +	0.047							
AG-98 (0.25%)		2-3 LF	88	98	95	68	95	100

continued

Table 66. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Northern jointvetch (AESVI)	Rice flatsedge (CYPIR)		Hemp sesbania (SEBEX)		Yellow nutsedge (CYPES)
			6/16	6/16	7/12	6/16	7/12	8/2
			----- (%) -----					
Clomazone <i>fb</i> carfentrazone + bensulfuron + AG-98 (0.25%)	0.4 0.02 0.0625	PRE 2-3 LF	25	95	95	63	95	100
Propanil + quinclorac <i>fb</i> propanil + halosulfuron	4.0 0.25 4.0 0.047	 2-3 LF PREFL	99	96	95	99	95	100
LSD (0.05)			39	23	16	44	0	46

continued

Table 66. Section 3.

Herbicide	Rate (lb/A)	Application timing	Weed control			Effect on rice		
			Barnyardgrass (ECHCG)			Injury		Yield
			6/16	7/12	8/2	5/26	6/16	9/17
			----- (%) -----			----- (lb/A) -----		
Untreated check			0	0	0	0	0	4140
Clomazone <i>fb</i> carfentrazone + AG-98 (0.25%) <i>fb</i> carfentrazone + AG-98 (0.25%)	0.4 0.02 0.02	PRE 2-3 LF PREFL	99	93	89	6	4	6300
Clomazone <i>fb</i> carfentrazone + AG-98 (0.25%)	0.4 0.02	PRE 2-3 LF	96	95	91	6	4	6390
Clomazone <i>fb</i> carfentrazone + bentazon + AG-98 (0.25%)	0.4 0.02 0.75	PRE 2-3 LF	96	95	93	9	0	6075
Clomazone <i>fb</i> carfentrazone + (acifluorfen + bentazon) + AG-98 (0.25%)	0.4 0.02 0.75	PRE 2-3 LF	94	95	100	10	9	5940

continued

Table 66. Section 3. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control			Effect on rice		
			Barnyardgrass (ECHCG)			Injury		Yield
			6/16	7/12	8/2	5/26	6/16	9/17
			----- (%) -----			----- (lb/A) -----		
Clomazone <i>fb</i>	0.4	PRE						
carfentrazone +	0.02							
acifluorfen +	0.125							
AG-98 (0.25%)		2-3 LF	98	91	93	6	3	6165
Carfentrazone +	0.02							
propanil	3.0	2-3 LF	43	5	71	0	3	5805
Carfentrazone +	0.02							
propanil +	3.0							
thiobencarb	4.0	2-3 LF	70	78	85	0	6	6255
Carfentrazone +	0.02							
propanil +	3.0							
pendimethalin	1.0	2-3 LF	54	60	80	0	5	5310
Carfentrazone +	0.02							
(propanil + molinate)	4.5	2-3 LF	49	10	50	0	2	5760
Carfentrazone +	0.02							
quinclorac +	0.375							
AG-98 (0.25%)		2-3 LF	94	95	100	0	5	6210
Carfentrazone +	0.02							
(fenoxaprop + safener)	0.045	2-3 LF	79	25	71	0	0	5805
Carfentrazone +	0.02							
bispyribac-sodium +	0.019							
AG-98 (0.25%)		2-3 LF	56	74	93	0	6	6255
Clomazone <i>fb</i>	0.4	PRE						
carfentrazone +	0.02							
halosulfuron +	0.047							
AG-98 (0.25%)		2-3 LF	96	93	98	6	11	5895
Clomazone <i>fb</i>	0.4	PRE						
carfentrazone +	0.02							
bensulfuron +	0.0625							
AG-98 (0.25%)		2-3 LF	94	95	98	10	3	6480
Propanil +	4.0							
quinclorac <i>fb</i>	0.25	2-3 LF						
propanil +	4.0							
halosulfuron	0.047	PREFL	98	95	100	0	5	6210
LSD (0.05)			16	19	13	2	6	1125

Table 67. Halosulfuron (Permit) tank mixes, Rohwer, 1999.

TEST INFORMATION

Location	Rohwer	Planting date	June 7, 1999
Experimental Design / replications	RCB / 4	Harvest date	October 12, 1999
Plot size	5 ft by 35 ft	Crop / Variety	Rice / Jefferson
Row width / Number of rows per plot	6 in. / 8 rows	Dates of flushing	April 26, June 8, 25, and July 7, 1999
Soil type	clay loam (8% sand, 49% silt, 43% clay)	Date of flooding	July 14, 1999
% OM / pH	3.5 / 6.7		

Comments: MPOST = mid-postemergence.

Application type	MPOST
Date applied	7/2/99
Time	7:25 am
Incorporation equipment	N/A
Air/Soil temperature (F)	81 / 70
Relative humidity (%)	82
Wind (mph)	7.5
Weather	clear
Soil moisture	dry
Crop stage/Height	3 lf / 5"
Sprayer type/mph	BkPkCO ₂ / 3
Nozzle type/Size	Flat fan / 8002
Boom ht / # Noz / Spacing (in.)	22 / 3 / 19
Gpa / Psi	15 / 22
Weed species	(# leaves or height)
IPOLA	4 lf
SEBEX	6"
IPOWR	4 lf
POROL	3"
LEFPA	3"

Conclusions: Various postemergence herbicides were evaluated for effectiveness on hemp sesbania, pitted morningglory, and palmleaf morningglory. Triclopyr (Grandstand) at 0.38 lb ai/A, bensulfuron (Londax) at 0.04 lb ai/A, carfentrazone (Aim) at 0.02 lb ai/A, and halosulfuron (Permit) at 0.04 lb ai/A did not provide acceptable control of hemp sesbania. Triclopyr at 0.38 lb ai/A was the only compound that provided greater than 95% control of pitted morningglory and palmleaf morningglory. Various tank mixtures of propanil (Stam), quinclorac (Facet), carfentrazone (Aim), halosulfuron, and propanil + molinate (Arrosolo) also provided greater than 90% control of pitted and palmleaf morningglory.

Table 67. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Hemp sesbania (SEBEX)			Common purslane (POROL)		Palmleaf morningglory (IPOWR)			Barnyard- grass (ECHCG)
			7/7	7/14	8/17	7/7	7/14	7/7	7/14	8/17	8/17
Untreated check			0	0	0	0	0	0	0	0	0
Halosulfuron + AG-98 (0.5%)	0.047	MPOST	43	80	90	10	10	3	10	17	13
Triclopyr + AG-98 (0.5%)	0.38	MPOST	35	43	33	70	68	43	97	97	17
(Propanil + molinate) + AG-98 (0.5%)	4.5	MPOST	95	100	92	80	42	30	0	0	83
Propanil + AG-98 (0.5%)	4.0	MPOST	96	100	92	85	65	42	20	7	94
Bensulfuron + AG-98 (0.5)	0.0375	MPOST	43	67	20	3	37	0	37	13	0
(Propanil + molinate) + thiobencarb + AG-98 (0.5%)	4.5 3.0	MPOST	95	100	97	88	83	57	37	27	72
Propanil + quinclorac + AG-98 (0.5%)	4.0 0.38	MPOST	98	100	100	92	87	94	100	100	37
Carfentrazone + AG-98 (0.5%)	0.02	MPOST	50	63	52	83	70	96	100	97	10
Halosulfuron + triclopyr + AG-98 (0.5%)	0.047 0.38	MPOST	83	95	93	83	80	63	100	92	47
Halosulfuron + (propanil + molinate) + AG-98 (0.5%)	0.047 4.5	MPOST	95	100	95	88	52	37	27	7	52
Halosulfuron + propanil + AG-98 (0.5%)	0.047 4.0	MPOST	95	100	100	90	63	37	20	17	27
Halosulfuron + bensulfuron + AG-98 (0.5%)	0.047 0.0375	MPOST	33	72	50	10	27	3	50	27	65
Halosulfuron + (propanil + molinate) + thiobencarb + AG-98 (0.5%)	0.047 4.5 3.0	MPOST	95	100	97	92	83	47	27	20	68

continued

Table 67. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Hemp sesbania (SEBEX)			Common purslane (POROL)		Palmleaf morningglory (IPOWR)			Barnyard- grass (ECHCG)
			7/7	7/14	8/17	7/7	7/14	7/7	7/14	8/17	8/17
			----- (%) -----								
Halosulfuron + propanil + quinclorac + AG-98 (0.5%)	0.047 4.0 0.38	MPOST	98	100	100	95	72	93	100	100	82
Halosulfuron + carfentrazone + AG-98 (0.5%)	0.047 0.02	MPOST	67	72	68	93	85	97	100	98	55
Halosulfuron + propanil (Super Wham) + AG-98 (0.5%)	0.047 4.0	MPOST	96	100	100	93	63	80	37	33	77
LSD (0.05)			20	17	16	16	33	18	23	28	52

continued

Table 67. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control						Effect on rice	
			Pitted morningglory (IPOLA)			Amazon sprangletop (LEFPA)		Injury		Yield
			7/7	7/14	8/17	7/14	7/7	7/14	10/12	
			----- (%) -----						----- (lb/A) -----	
Untreated check			0	0	0	0	0	0	675	
Halosulfuron + AG-98 (0.5%)	0.047	MPOST	13	37	83	27	0	0	5400	
Triclopyr + AG-98 (0.5%)	0.38	MPOST	32	100	98	10	0	0	4995	
(Propanil + molinate) + AG-98 (0.5%)	4.5	MPOST	60	23	53	77	0	0	5940	
Propanil + AG-98 (0.5%)	4.0	MPOST	78	37	43	88	2	0	6435	
Bensulfuron + AG-98 (0.5)	0.0375	MPOST	0	50	90	28	0	0	5175	

continued

Table 67. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Pitted morningglory (IPOLA)			Amazon sprangletop (LEFPA)	Effect on rice		
			7/7	7/14	8/17	7/14	Injury 7/7	7/14	Yield 10/12
			-----			(%)	-----		(lb/A)
Propanil + molinate) + thiobencarb + AG-98 (0.5%)	4.5 3.0	MPOST	68	83	95	98	10	0	6615
Propanil + quinclorac + AG-98 (0.5%)	4.0 0.38	MPOST	94	100	100	67	13	0	6885
Carfentrazone + AG-98 (0.5%)	0.02	MPOST	96	87	98	32	3	0	4680
Halosulfuron + triclopyr + AG-98 (0.5%)	0.047 0.38	MPOST	53	83	100	60	0	0	5580
Halosulfuron + (propanil + molinate) + AG-98 (0.5%)	0.047 4.5	MPOST	58	78	60	55	0	0	7020
Halosulfuron + propanil + AG-98 (0.5%)	0.047 4.0	MPOST	83	83	93	77	7	0	7470
Halosulfuron + bensulfuron + AG-98 (0.5%)	0.047 0.0375	MPOST	3	67	100	0	0	0	6120
Halosulfuron + (propanil + molinate) + thiobencarb + AG-98 (0.5%)	0.047 4.5 3.0	MPOST	48	70	58	100	12	0	6300
Halosulfuron + propanil + quinclorac + AG-98 (0.5%)	0.047 4.0 0.38	MPOST	94	100	100	85	12	0	7920
Halosulfuron + carfentrazone + AG-98 (0.5%)	0.047 0.02	MPOST	97	97	100	17	0	0	6615
Halosulfuron + propanil (Super Wham) + AG-98 (0.5%)	0.047 4.0	MPOST	93	93	90	50	22	0	6390
LSD (0.05)			24	29	40	39	5	NS	2115

Table 68. Bensulfuron (Londax) and halosulfuron (Permit) combinations, Lodge Corner, 1999.**TEST INFORMATION**

Location	Lodge Corner	Planting date	May 3, 1999
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	7 ft by 20 ft	Crop / Variety	Rice / Bengal
Row width / Number of rows per plot	7.5 in. / 9 rows	Dates of flushing	May 15, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 8, 1999
% OM / pH	1.3 / 5.1		

Comments: PRE = preemergence; PREFL = pre flood; and POFL = post flood.

Application type	PRE	PREFL	POFL
Date applied	5/3/99	6/3/99	6/23/99
Time	4:20 pm	3:10 pm	11:30 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	81 / 70	93 / 84	83 / 80
Relative humidity (%)	36	59	82
Wind (mph)	7	7	4.5
Weather	partly cloudy	partly cloudy	cloudy
Soil moisture	moist	moist	flooded
Crop stage/Height	N/A	4 lf / 7"	tiller / 18"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	15 / 4 / 20	18 / 4 / 20	48 / 4 / 20
Gpa / Psi	10 / 21	10 / 15	10 / 22
Weed species	----- (# leaves/height) -----		
CYPES	N/A	6 lf / 8"	bloom / 18"
AESVI	N/A	3 lf / 3"	N/A

Conclusions: The objective of this study was to compare various rates of halosulfuron (Permit) tank mixed with bensulfuron (Londax) for controlling nutsedge and broadleaf weeds. Halosulfuron was more effective on nutsedge than bensulfuron, but bensulfuron was more effective on annual broadleaf and aquatic weeds. In this study, all treatments controlled yellow nutsedge. The blanket treatment of clomazone (Command) and quinclorac (Facet) suppressed most of the broadleaf weed pressure even though they were applied at reduced rates. The test area became over-grown with red rice later in the season.

Table 68.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Yellow nutsedge (CYPES)		Northern jointvetch (AESVI)	Annual grasses	Rice injury	
			6/11	6/25	6/11	6/25	6/11	6/25
			----- (%) -----					
Clomazone + quinclorac (check)	0.3 0.188	PRE	5	0	10	0	0	0
Clomazone + quinclorac <i>fb</i> halosulfuron + Agri-Dex (1%)	0.3 0.188 0.0117	PRE PREFL	25	100	79	99	3	0
Clomazone + quinclorac <i>fb</i> halosulfuron + Agri-Dex (1%)	0.3 0.188 0.0234	PRE PREFL	44	100	75	93	0	0
Clomazone + quinclorac <i>fb</i> halosulfuron + Agri-Dex (1%)	0.3 0.188 0.047	PRE PREFL	29	100	83	95	0	0
Clomazone + quinclorac <i>fb</i> bensulfuron + Agri-Dex (1%)	0.3 0.188 0.0281	PRE PREFL	25	35	70	85	0	0
Clomazone + quinclorac <i>fb</i> bensulfuron + halosulfuron + Agri-Dex (1%)	0.3 0.188 0.0281 0.0117	PRE PREFL	40	99	73	99	5	0
Clomazone + quinclorac <i>fb</i> bensulfuron + halosulfuron + Agri-Dex (1%)	0.3 0.188 0.0281 0.0234	PRE PREFL	40	94	76	89	1	0
Clomazone + quinclorac <i>fb</i> bensulfuron + propanil	0.3 0.188 0.0281 3.0	PRE PREFL	60	80	88	94	10	0
Clomazone + quinclorac <i>fb</i> propanil	0.3 0.188 3.0	PRE PREFL	58	55	88	86	10	0

continued

Table 68. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Yellow nutsedge (CYPES)		Northern jointvetch (AESVI)	Annual grasses	Rice injury	
			6/11	6/25	6/11	6/25	6/11	6/25
			----- (%) -----					
Clomazone + quinclorac <i>fb</i> propanil + halosulfuron	0.3 0.188 3.0 0.0234	PRE PREFL	59	100	94	99	10	0
Clomazone + quinclorac <i>fb</i> halosulfuron + Agri-Dex (1%)	0.3 0.188 0.0117	PRE POFL	0	0	0	69	0	0
Clomazone + quinclorac <i>fb</i> halosulfuron + Agri-Dex (1%)	0.3 0.188 0.0234	PRE POFL	0	0	0	81	0	0
Clomazone + quinclorac <i>fb</i> halosulfuron + Agri-Dex (1%)	0.3 0.188 0.047	PRE POFL	0	0	0	68	0	0
Clomazone + quinclorac <i>fb</i> bensulfuron + Agri-Dex (1%)	0.3 0.188 0.0375	PRE POFL	0	0	10	70	0	0
Clomazone + quinclorac <i>fb</i> bensulfuron + Agri-Dex (1%)	0.3 0.188 0.0375	PRE POFL	0	0	0	65	0	0
Clomazone + quinclorac <i>fb</i> bensulfuron + halosulfuron + Agri-Dex (1%)	0.3 0.188 0.0375 0.0234	PRE POFL	0	0	0	78	0	0
Clomazone + quinclorac <i>fb</i> bensulfuron + halosulfuron + propanil	0.3 0.188 0.028 0.015 3.0	PRE PREFL	63	96	88	99	14	0
Clomazone + quinclorac <i>fb</i> propanil + halosulfuron	0.3 0.188 1.0 0.047	PRE POFL	0	5	0	71	0	0
LSD (0.05)			17	18	15	21	5	NS

Table 69. Pendimethalin (Prowl) DPRE for rice weed control, Rohwer, 1999.

TEST INFORMATION

Location	Rohwer	Planting date	April 22, 1999
Experimental Design / replications	RCB / 4	Harvest date	October 12, 1999
Plot size	5 ft by 35 ft	Crop / Variety	Rice / Lemont
Row width / Number of rows per plot	6 in. / 10 rows	Dates of flushing	April 26, May 5, 11, and 27, 1999
Soil type	clay loam (8% sand, 49% silt, 43% clay)	Date of flooding	June 11, 1999
% OM / pH	3.5 / 6.7		

Comments: DPRE = delayed preemergence; and EPOST = early postemergence.

Application type	DPRE	EPOST
Date applied	5/7/99	5/17/99
Time	7:00 am	7:30 am
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	70 / 71	77 / 78
Relative humidity (%)	70	65
Wind (mph)	7	6
Weather	cloudy	N/A
Soil moisture	dry	dry
Crop stage/Height	N/A	2-3 lf / 3.5"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Flat fan / 8002	Flat fan / 8002
Boom ht / # Noz / Spacing (in.)	22 / 3 / 19	22 / 3 / 19
Gpa / Psi	15 / 22	15 / 22
Weed species	----- (# leaves or height) -----	
ECHCG	N/A	2-3 lf
SEBEX	N/A	2-3"

Conclusions: Rice was tolerant to all treatments. Hemp sesbania was controlled 14 DAT with treatments containing pendimethalin (Prowl) + quinclorac (Facet), thiobencarb (Bolero) + quinclorac, and propanil (Stam) + thiobencarb. Clomazone (Command) + quinclorac, thiobencarb + pendimethalin, pendimethalin + clomazone, clomazone alone, and pendimethalin alone failed to provide hemp sesbania control at 14 or 22 DAT. Control of hemp sesbania treated with thiobencarb + propanil declined by 50% by 22 DAT. Pendimethalin applied at 1.0, 1.24, and 1.5 lb ai/A DPRE provided excellent barnyardgrass control at 14 DAT, but began to break by 22 DAT. Clomazone alone, clomazone + quinclorac or thiobencarb, pendimethalin + clomazone or quinclorac, and thiobencarb + quinclorac each provided greater than 90% control of barnyardgrass 22 DAT. Greater than 90% season-long control of barnyardgrass was provided by clomazone, pendimethalin + quinclorac, and clomazone + quinclorac. Yields were reflective of weed control.

Table 69. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control				
			Barnyardgrass (ECHCG)			Hemp sesbania (SEBEX)	
			5/18	5/25	7/19	5/25	7/19
			----- (%) -----				
Untreated check			0	0	0	0	0
Pendimethalin	1.0	DPRE	92	68	35	8	9
Pendimethalin	1.24	DPRE	95	89	23	20	24
Pendimethalin	1.5	DPRE	97	80	44	0	5
Pendimethalin <i>fb</i> pendimethalin	1.24 0.74	DPRE EPOST	90	85	51	13	38
Pendimethalin + clomazone	1.0 0.3	DPRE	98	96	87	0	5
Clomazone	0.4	DPRE	98	97	94	21	0
Pendimethalin + quinclorac	1.0 0.25	DPRE	98	98	98	88	90
Clomazone + quinclorac	0.4 0.25	DPRE	98	96	99	38	46
Clomazone + thiobencarb	0.4 4.0	DPRE	98	96	87	50	28
Thiobencarb + pendimethalin	4.0 1.0	DPRE	98	87	33	31	30
Thiobencarb + quinclorac	4.0 0.25	DPRE	98	93	60	96	71
Thiobencarb + propanil	4.0 4.0	DPRE	93	53	0	94	51
LSD (0.05)			5	19	33	33	29

continued

Table 69. Section 2.

Herbicide	Rate (lb/A)	Application timing	Effect on rice		Yield (lb/A)
			Injury		
			5/18 ----- (%) -----	7/15 -----	
Untreated check			0	0	315
Pendimethalin	1.0	DPRE	1	0	2025
Pendimethalin	1.24	DPRE	0	0	2115
Pendimethalin	1.5	DPRE	5	0	2745
Pendimethalin <i>fb</i> pendimethalin	1.24 0.74	DPRE EPOST	0	0	2970
Pendimethalin + clomazone	1.0 0.3	DPRE	0	0	5580
Clomazone	0.4	DPRE	0	0	5805
Pendimethalin + quinclorac	1.0 0.25	DPRE	0	0	1850
Clomazone + quinclorac	0.4 0.25	DPRE	0	0	5580
Clomazone + thiobencarb	0.4 4.0	DPRE	0	0	4635
Thiobencarb + pendimethalin	4.0 1.0	DPRE	0	0	3105
Thiobencarb + quinclorac	4.0 0.25	DPRE	0	0	4500
Thiobencarb + propanil	4.0 4.0	DPRE	0	0	180
LSD (0.05)			NS	NS	1440

Table 70. Rice herbicide standards, Lonoke, 1999.

TEST INFORMATION

Location	Lonoke	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 15, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Wells
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.6 / 4.8		

Comments: PRE = preemergence; DPRE = delayed preemergence; 3-4 LF = 3-4 leaf rice; and PREFL = pre flood.

Application type	PRE	DPRE	3-4 LF	PREFL
Date applied	5/11/99	5/17/99	6/2/99	6/10/99
Time	4:40 pm	4:50 pm	8:40 am	11:00 am
Incorporation equipment	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	80 / 72	84 / 78	73 / 68	82 / 80
Relative humidity (%)	62	61	78	66
Wind (mph)	4	6	1	5
Weather	partly cloudy	cloudy	cloudy	clear
Soil moisture	dry	saturated	saturated	moist
Crop stage/Height	N/A	spiking / 0.25"	3-4 lf / 7"	1 tiller / 11"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	16 / 6 / 20	16 / 6 / 20	18 / 6 / 20	20 / 6 / 20
Gpa / Psi	10 / 21	10 / 23	10 / 18	10 / 23
Weed species	----- (# leaves/height) -----			
BRAPP	N/A	N/A	4 lf / 1"	N/A
CYPIR	N/A	N/A	4 lf / 1"	3 lf / 3-4"
MOLVE	N/A	N/A	5 lf	flowering / 0.5"

Conclusions: Many of the older, standard herbicide practices continue to provide outstanding weed control.

Table 70. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Rice flatsedge (CYPIR)	Broadleaf signalgrass (BRAPP)				Eclipta (ECLAL)	Barnyardgrass (ECHCG)	
			6/4	6/15	7/12	8/2	6/4	7/12	8/2	
			----- (%) -----							
Untreated check			0	0	0	0	0	0	0	
Propanil (Super Wham) + Penetrator Plus (1 pt/A) <i>fb</i>	4.0	2-3 LF								
propanil + Penetrator Plus (1 pt/A)	4.0	PREFL	95	93	95	100	95	95	96	
Propanil + Penetrator Plus (1 pt/A) <i>fb</i>	4.0	2-3 LF								
propanil + triclopyr + Penetrator Plus (1 pt/A)	4.0 0.25	PREFL	95	94	95	100	95	95	100	
Quinclorac + pendimethalin	0.188 1.0	DPRE	70	90	95	100	95	95	100	
Quinclorac + thiobencarb	0.188 2.0	DPRE	88	94	95	100	95	95	100	
Quinclorac + pendimethalin <i>fb</i> propanil + Penetrator Plus (1 pt/A)	0.188 1.0 3.0	DPRE PREFL	95	95	95	100	95	95	100	
Quinclorac + thiobencarb <i>fb</i> propanil + Penetrator Plus (1 pt/A)	0.188 2.0 3.0	DPRE PREFL	90	95	95	100	95	95	98	
Propanil + quinclorac + Penetrator Plus (1 pt/A)	3.0 0.17	2-3 LF	86	95	95	100	95	95	99	
Pendimethalin + quinclorac <i>fb</i> propanil + quinclorac + Penetrator Plus (1 pt/A)	1.0 0.188 2.0 0.125	DPRE 2-3 LF	95	95	95	100	95	95	100	
Clomazone <i>fb</i> propanil + Penetrator Plus (1 pt/A)	0.3 4.0	PRE PREFL	63	95	95	100	95	95	100	
Propanil + Penetrator Plus (1 pt/A) + pendimethalin	3.0 1.0	2-3 LF	68	89	95	100	95	95	100	

continued

Table 70. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control							
			Rice flatsedge (CYPIR)	Broadleaf signalgrass (BRAPP)				Eclipta (ECLAL)	Barnyardgrass (ECHCG)	
			6/4	6/15	7/12	8/2	6/4	7/12	8/2	
			----- (%) -----							
Propanil + Penetrator Plus (1 pt/A) + thiobencarb	3.0 3.0	2-3 LF	95	88	95	100	95	95	99	
Propanil + Penetrator Plus (1 pt/A) + quinclorac	3.0 0.25	2-3 LF	91	94	95	100	95	95	100	
Propanil + Penetrator Plus (1 pt/A) + clomazone	3.0 0.4	2-3 LF	84	95	95	100	95	95	100	
LSD (0.05)			18	3	1	1	1	1	2	

continued

Table 70. Section 2.

Herbicide	Rate (lb/A)	Application timing	Carpetweed	Effect on rice			Yield 9/15 (lb/A)
			(MOLVE) control	Injury		6/15	
			6/15	5/26	7/12		
			----- (%) -----				
Untreated check			0	0	0	0	525
Propanil (Super Wham) + Penetrator Plus (1 pt/A) <i>fb</i> propanil + Penetrator Plus (1 pt/A)	4.0 4.0	2-3 LF PREFL	95	0	5	0	8370
Propanil + Penetrator Plus (1 pt/A) <i>fb</i> propanil + triclopyr + Penetrator Plus (1 pt/A)	4.0 4.0 0.25	2-3 LF PREFL	95	0	10	0	8190
Quinclorac + pendimethalin	0.188 1.0	DPRE	60	5	0	0	8100
Quinclorac + thiobencarb	0.188 2.0	DPRE	40	6	0	0	8550

continued

Table 70. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Carpetweed	Effect on rice			Yield 9/15 (lb/A)
			(MOLVE) control	Injury			
			6/15	5/26	6/15	7/12	
			-----	(%)	-----		
Quinclorac + pendimethalin <i>fb</i> propanil + Penetrator Plus (1 pt/A)	0.188 1.0 3.0	DPRE PREFL	95	5	0	0	8550
Quinclorac + thiobencarb <i>fb</i> propanil + Penetrator Plus (1 pt/A)	0.188 2.0 3.0	DPRE PREFL	84	8	0	0	8820
Propanil + quinclorac + Penetrator Plus (1 pt/A)	3.0 0.17	2-3 LF	95	0	0	0	9225
Pendimethalin + quinclorac <i>fb</i> propanil + quinclorac + Penetrator Plus (1 pt/A)	1.0 0.188 2.0 0.125	DPRE 2-3 LF	95	9	0	0	8685
Clomazone <i>fb</i> propanil + Penetrator Plus (1 pt/A)	0.3 4.0	PRE PREFL	53	4	10	0	8370
Propanil + Penetrator Plus (1 pt/A) + pendimethalin	3.0 1.0	2-3 LF	95	1	18	0	8550
Propanil + Penetrator Plus (1 pt/A) + thiobencarb	3.0 3.0	2-3 LF	95	3	0	0	8325
Propanil + Penetrator Plus (1 pt/A) + quinclorac	3.0 0.25	2-3 LF	94	1	3	0	8595
Propanil + Penetrator Plus (1 pt/A) + clomazone	3.0 0.4	2-3 LF	95	3	8	0	8640
LSD (0.05)			15	2	13	NS	900

Table 71. Preemergence combinations for weed control in rice, Lonoke, 1999.**TEST INFORMATION**

Location	Lonoke	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 15, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Wells
Row width / Number of rows per plot	7.5 in. / rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.3 / 5.1		

Comments: PRE = preemergence; DPRE = delayed preemergence; and 2-3 LF = 2 to 3-leaf rice.

Application type	PRE	DPRE	2-3 LF
Date applied	5/11/99	5/17/99	6/2/99
Time	4:40 pm	4:30 pm	8:00 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	80 / 72	91 / 79	68 / 66
Relative humidity (%)	62	49	87
Wind (mph)	4	5	4
Weather	partly cloudy	partly cloudy	cloudy
Soil moisture	dry	saturated	saturated
Crop stage/Height	N/A	spiking	3-4 lf / 7"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	16 / 6 / 20	16 / 6 / 23	18 / 6 / 20
Gpa / Psi	10 / 21	10 / 23	10 / 18
Weed species	----- [# leaves/height (in.)]-----		
BRAPP	N/A	N/A	4 lf / 0.5"
CYPIR	N/A	N/A	4 lf / 1"
MOLVE	N/A	N/A	4 lf / 0.25"

Conclusions: MP-44 reduced rate standards of pendimethalin (Prowl) + quinclorac (Facet) and thiobencarb (Bolero) + quinclorac provided excellent control.

Table 71. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Broadleaf signalgrass (BRAPP)					Eclipta (ECLAL)	Barnyardgrass (ECHCG)
			5/26	6/4	6/15	7/12	8/2	6/4	8/2
			----- (%) -----						
Untreated check			0	0	0	0	0	0	0
Quinclorac	0.375	PRE	100	98	94	100	100	98	100
Quinclorac + Agri-Dex (1%)	0.375	2-3 LF	70	48	91	80	100	100	100
Clomazone	0.3	PRE	94	99	81	100	95	100	98
Clomazone	0.4	PRE	90	99	89	100	100	100	100
Quinclorac + clomazone	0.188 0.3	PRE	100	98	90	100	100	100	100
Quinclorac + clomazone	0.25 0.3	PRE	98	99	94	100	100	100	100
Clomazone <i>fb</i> quinclorac + Agri-Dex (1%)	0.4 0.25	PRE 2-3 LF	95	100	93	100	100	100	100
Quinclorac + pendimethalin	0.188 1.0	DPRE	100	100	91	100	99	100	100
Quinclorac + thiobencarb	0.188 3.0	DPRE	100	100	91	100	95	100	100
Pendimethalin	1.0	PRE	88	38	28	0	0	0	0
Pendimethalin	1.5	PRE	93	43	35	15	0	0	23
Pendimethalin	1.0	DPRE	95	55	38	5	5	0	20
Pendimethalin	1.5	DPRE	93	53	48	31	0	0	21
Pendimethalin <i>fb</i> pendimethalin	1.0 1.0	DPRE 2-3 LF	90	48	43	18	3	0	23
Pendimethalin + clomazone	1.0 0.3	DPRE	88	100	73	100	100	100	99
Clomazone	0.3	DPRE	80	98	59	66	45	100	73
Pendimethalin <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	1.0 0.019	DPRE 2-3 LF	91	58	65	66	39	25	96
LSD (0.05)			17	10	11	30	21	9	32

continued

Table 71. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control					
			Rice flatsedge (CYPIR)				Carpetweed (MOLVE)	
			6/4	6/15	7/12	8/2	6/4	6/15
			----- (%) -----					
Untreated check			0	0	0	96	0	0
Quinclorac	0.375	PRE	88	25	48	38	18	0
Quinclorac + Agri-Dex (1%)	0.375	2-3 LF	30	30	48	31	0	38
Clomazone	0.3	PRE	0	0	4	6	0	0
Clomazone	0.4	PRE	20	0	15	15	25	0
Quinclorac + clomazone	0.188 0.3	PRE	63	13	25	28	10	13
Quinclorac + clomazone	0.25 0.3	PRE	83	23	76	69	10	0
Clomazone <i>fb</i> quinclorac + Agri-Dex (1%)	0.4 0.25	PRE 2-3 LF	33	38	68	69	38	30
Quinclorac + pendimethalin	0.188 1.0	DPRE	95	84	88	91	90	81
Quinclorac + thiobencarb	0.188 3.0	DPRE	96	93	96	94	85	55
Pendimethalin	1.0	PRE	78	55	18	0	80	84
Pendimethalin	1.5	PRE	80	61	53	0	88	94
Pendimethalin	1.0	DPRE	78	45	56	3	80	76
Pendimethalin	1.5	DPRE	83	55	44	0	88	93
Pendimethalin <i>fb</i> pendimethalin	1.0 1.0	DPRE 2-3 LF	75	54	81	3	88	93
Pendimethalin + clomazone	1.0 0.3	DPRE	55	18	19	18	90	64
Clomazone	0.3	DPRE	0	0	38	28	0	8
Pendimethalin <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	1.0 0.019	DPRE 2-3 LF	88	86	100	94	93	93
LSD (0.05)			21	29	34	33	19	26

continued

Table 71. Section 3.

Herbicide	Rate (lb/A)	Application timing	Hemp sesbania (SEBEX) control		Effect on rice			Yield 9/15 (lb/A)
			7/12	8/2	Injury			
					8/26 (%)	6/4	6/15	
Untreated check			0	73	0	0	0	4320
Quinclorac	0.375	PRE	100	100	18	5	0	7920
Quinclorac + Agri-Dex (1%)	0.375	2-3 LF	100	100	0	0	0	8010
Clomazone	0.3	PRE	78	50	11	10	0	6750
Clomazone	0.4	PRE	84	59	25	13	0	6885
Quinclorac + clomazone	0.188 0.3	PRE	98	98	8	11	0	7470
Quinclorac + clomazone	0.25 0.3	PRE	100	100	8	8	0	8820
Clomazone <i>fb</i> quinclorac + Agri-Dex (1%)	0.4 0.25	PRE 2-3 LF	100	100	23	13	0	8325
Quinclorac + pendimethalin	0.188 1.0	DPRE	99	100	23	9	0	8280
Quinclorac + thiobencarb	0.188 3.0	DPRE	100	100	20	9	0	8190
Pendimethalin	1.0	PRE	41	0	0	0	0	3960
Pendimethalin	1.5	PRE	68	40	0	0	0	4410
Pendimethalin	1.0	DPRE	70	41	0	0	0	5310
Pendimethalin	1.5	DPRE	88	23	0	0	0	6075
Pendimethalin <i>fb</i> pendimethalin	1.0 1.0	DPRE 2-3 LF	91	66	0	0	0	5580
Pendimethalin + clomazone	1.0 0.3	DPRE	80	46	15	10	0	6885
Clomazone	0.3	DPRE	88	43	11	10	0	6345
Pendimethalin <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	1.0 0.019	DPRE 2-3 LF	100	98	0	0	0	7830
LSD (0.05)			29	43	6	4	0	1350

Table 72. Different rates of preemergence herbicides in rice to be followed by wheat, Lonoke, 1999.**TEST INFORMATION**

Location	Lonoke	Planting date	May 10, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 17, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Wells
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type	Calloway silt loam (8% sand, 75% silt, 16% clay)	Date of flooding	June 18, 1999
% OM / pH	1.3 / 5.1		

Comments: PPI = preemergence incorporated; PRE = preemergence; and PREFL = pre flood.

Application type	PPI	PRE	PREFL
Date applied	5/10/99	5/10/99	6/4/99
Time	10:15 am	2:10 pm	5:00 pm
Incorporation equipment	field cultivator	N/A	N/A
Air/Soil temperature (F)	86 / 70	85 / 75	94 / 86
Relative humidity (%)	50	35	52
Wind (mph)	4.5	7	4
Weather	partly cloudy	partly cloudy	mostly cloudy
Soil moisture	dry	moist	dry
Crop stage/Height	N/A	N/A	4 lf / 5"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	16 / 6 / 20	16 / 6 / 20	20 / 6 / 20
Gpa / Psi	10 / 19	10 / 19	10 / 18

Conclusions: Grass pressure in this study was very light and grass data are poor. The test will be planted to wheat to evaluate any herbicide carryover.

Table 72. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Broadleaf signalgrass (BRAPP)				Rice flatsedge (CYPIR)	Barnyardgrass (ECHCG)	
			6/4	6/15	7/12	8/2	6/4	7/12	8/2
			(%)						
[Acifluorfen + bentazon (Storm), 1.5 lb/A + AG-98 (0.25%) was applied PREFL to entire test on 6/4:									
Check			0	0	0	0	0	98	96
Clomazone	0.1	PPI	58	60	86	79	0	95	83
Clomazone	0.2	PPI	88	81	100	100	0	100	100
Clomazone	0.3	PPI	98	93	100	100	0	100	100
Clomazone	0.4	PPI	95	93	100	100	0	100	100
Clomazone	0.5	PPI	100	94	100	100	0	100	100
Clomazone	0.6	PPI	100	95	100	100	0	100	100
Clomazone	0.1	PRE	25	55	70	69	0	94	73
Clomazone	0.2	PRE	33	64	100	100	0	100	100
Clomazone	0.3	PRE	97	81	100	98	0	100	100
Clomazone	0.4	PRE	100	86	100	100	0	99	100
Clomazone	0.5	PRE	99	93	100	100	0	100	100
Clomazone	0.6	PRE	100	93	100	100	0	99	100
Quinclorac	0.25	PPI	99	90	100	100	85	100	100
Quinclorac	0.375	PPI	100	94	100	100	80	100	100
Quinclorac	0.25	PRE	99	89	100	100	73	100	100
Quinclorac	0.375	PRE	100	90	100	100	88	100	100
Quinclorac + clomazone	0.188 0.3	PPI	100	93	100	100	68	100	100
Quinclorac + clomazone	0.188 0.3	PRE	99	90	100	100	79	100	100
LSD (0.05)			10	7	10	17	12	5	17

continued

Table 72. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control					Yield 9/17 (lb/A)
			Amazon		Effect on rice			
			Carpetweed (MOLVE) 6/4	sprangletop (LEFPA) 8/2	Injury			
			----- (%) -----			5/26	6/4	
[Acifluorfen + bentazon (Storm), 1.5 lb/A + AG-98 (0.25%) was applied PREFL to entire test on 6/4:								
Check			0	100	0	0	0	7605
Clomazone	0.1	PPI	0	75	3	0	0	8640
Clomazone	0.2	PPI	0	100	1	5	0	8055
Clomazone	0.3	PPI	0	100	8	24	15	7920
Clomazone	0.4	PPI	0	100	8	31	14	7335
Clomazone	0.5	PPI	0	100	9	40	24	8010
Clomazone	0.6	PPI	0	100	11	53	35	7605
Clomazone	0.1	PRE	0	100	0	0	0	8145
Clomazone	0.2	PRE	0	100	4	0	0	8415
Clomazone	0.3	PRE	0	100	4	8	0	7965
Clomazone	0.4	PRE	0	100	9	11	0	7695
Clomazone	0.5	PRE	0	100	8	20	10	8010
Clomazone	0.6	PRE	0	100	9	28	8	7110
Quinclorac	0.25	PPI	10	98	5	8	8	8280
Quinclorac	0.375	PPI	0	100	8	8	8	8100
Quinclorac	0.25	PRE	0	100	8	3	5	8145
Quinclorac	0.375	PRE	0	100	6	13	8	7380
Quinclorac + clomazone	0.188 0.3	PPI	0	100	6	24	13	8100
Quinclorac + clomazone	0.188 0.3	PRE	0	100	6	6	3	6795
LSD (0.05)			6	16	3	7	7	1035

Table 73. Postemergence herbicides with varied preemergence herbicide options, Rohwer, 1999.

TEST INFORMATION

Location	Rohwer	Planting date	April 21, 1999
Experimental Design / replications	RCB / 4	Harvest date	October 12, 1999
Plot size	5 ft by 35 ft	Crop / Variety	Rice / Lemont
Row width / Number of rows per plot	6 in. / 8 rows	Dates of flushing	April 26, May 3, 11, and 27, 1999
Soil type	clay loam (8% sand, 49% silt, 43% clay)	Date of flooding	June 11, 1999
% OM / pH	3.5 / 6.7		

Comments: PRE = preemergence, and PREFL = preflood.

Application type	PRE	PREFL
Date applied	4/23/99	6/6/99
Time	8:30 am	11:30 am
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	60 / 56	80 / 80
Relative humidity (%)	45	65
Wind (mph)	4	6
Weather	clear	N/A
Soil moisture	dry	dry
Crop stage/Height	N/A	4-5 lf / 6"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Flat fan / 8002	Flat fan / 8002
Boom ht / # Noz / Spacing (in.)	22 / 3 / 19	22 / 3 / 19
Gpa / Psi	15 / 22	15 / 25
Weed species	----- (# leaves) -----	
IPOLA	N/A	4-5 lf
SEBEX	N/A	2-5 lf
ECHCG	N/A	2-5 lf

Conclusions: Clomazone (Command) alone provided 100% control of barnyardgrass but little broadleaf activity. PREFL applications that did not include a PRE compound did not provide acceptable control of barnyardgrass due to size of the grass at the time of application. Hemp sesbania and morningglory were controlled with combinations of propanil (Stam), quinclorac (Facet), pendimethalin (Prowl), bispyribac-sodium (Regiment), and propanil + molinate (Arrosolo) applied PREFL. Barnyardgrass control in treatments without clomazone was less than 50%.

Table 73.

Herbicide	Rate (lb/A)	Application timing	Weed control						Rice yield (lb/A)
			Barnyardgrass (ECHCG)		Pitted morningglory (IPOLA)		Hemp sesbania (SEBEX)		
			6/8	7/19	6/8	7/19	6/8	7/19	
Untreated check			0	0	0	0	0	0	585
Clomazone <i>fb</i> propanil	0.5 4.0	PRE PREFL	100	84	0	100	8	100	7875
Clomazone <i>fb</i> propanil + quinclorac	0.5 4.0 0.25	PRE PREFL	100	97	0	100	0	100	7065
Clomazone <i>fb</i> propanil + pendimethalin	0.5 4.0 1.0	PRE PREFL	100	91	0	100	0	100	6885
Clomazone <i>fb</i> propanil + bispyribac-sodium	0.5 4.0 0.02	PRE PREFL	100	97	0	99	0	100	7110
Clomazone <i>fb</i> (propanil + molinate)	0.5 6.0	PRE PREFL	100	99	0	99	0	100	6705
Propanil	4.0	PREFL	0	0	0	100	0	100	3600
Propanil + quinclorac	4.0 0.25	PREFL	0	45	0	100	0	100	5085
Propanil + pendimethalin	4.0 1.0	PREFL	0	0	0	99	0	100	2970
Propanil + bispyribac-sodium	4.0 0.02	PREFL	0	0	0	99	0	100	4050
(Propanil + molinate)	6.0	PREFL	0	45	0	99	0	100	4050
LSD (0.05)			0	8	NS	1	6	0	1170

Table 74. Potential antagonism with grass and broadleaf herbicides, Lonoke, 1999.

TEST INFORMATION

Location	Lonoke	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 17, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Bengal
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.4 / 4.8		

Comments: 4-5 LF = 4-5 leaf rice.

Application type	4-5 LF
Date applied	6/4/99
Time	4:30 pm
Incorporation equipment	N/A
Air/Soil temperature (F)	93 / 86
Relative humidity (%)	51
Wind (mph)	5
Weather	partly cloudy
Soil moisture	dry
Crop stage/Height	4-5 lf / 4"
Sprayer type/mph	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	20 / 6 / 20
Gpa / Psi	10 / 22
Weed species	[# leaves/height (in.)]
BRAPP	8 lf / 4"
MOLVE	7 lf / 0"
CYPIR	4 lf / 2"
SEBEX	3 lf / 3"

Conclusions: This study was established to determine if there was a potential for antagonism with the new graminicides that might be labeled in the future for rice. Grass was at a 4- to 5-leaf stage when these treatments were applied. When fenoxaprop + safener (Ricestar) was tank-mixed with the broadleaf materials, antagonism was observed with acifluorfen + bentazon (Storm), acifluorfen (Blazer), triclopyr (Grandstand), bensulfuron (Londax), halosulfuron (Permit), and propanil for barnyardgrass control. When cyhalofop-butyl (Clincher) was tank-mixed with the broadleaf materials, antagonism was observed with acifluorfen + bentazon, bentazon (Basagran), acifluorfen, triclopyr, bensulfuron, halosulfuron, carfentrazone (Aim), and propanil for barnyardgrass control. Rice treated with clefoxydim (Aura) was severely injured after the application, but the rice recovered. Efficacy of clefoxydim was slower when tank-mixed than when applied alone. However, over time the treatments showed no sign of antagonism except when clefoxydim was tank-mixed with propanil for barnyardgrass control.

Table 74. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Broadleaf signalgrass (BRAPP)				Rice flatsedge (CYPIR)				Eclipta (ECLAL)
			6/12	6/17	7/12	8/2	6/12	6/17	7/12	8/2	8/2
-----								----- (%) -----			
Untreated check			0	0	0	0	0	0	0	0	0
(Fenoxaprop + safener) + Agri-Dex (1%) + (acifluorfen + bentazon)	0.08	4-5 LF	83	78	100	90	98	95	100	100	90
(Fenoxaprop + safener) + Agri-Dex (1%) + bentazon	0.08	4-5 LF	81	91	100	96	85	80	95	68	68
(Fenoxaprop + safener) + Agri-Dex (1%) + acifluorfen	0.08	4-5 LF	88	82	100	98	96	91	90	84	54
(Fenoxaprop + safener) + Agri-Dex (1%) + triclopyr	0.08	4-5 LF	43	71	83	64	20	64	69	31	99
(Fenoxaprop + safener) + Agri-Dex (1%) + bensulfuron	0.08	4-5 LF	43	68	100	68	38	57	87	88	94
(Fenoxaprop + safener) + Agri-Dex (1%) + halosulfuron	0.08	4-5 LF	18	43	57	36	71	83	100	100	100
(Fenoxaprop + safener) + Agri-Dex (1%) + carfentrazone	0.08	4-5 LF	64	86	98	100	0	30	50	0	73
(Fenoxaprop + safener) + Agri-Dex (1%) + propanil	0.08	4-5 LF	91	81	98	100	61	67	100	85	79
(Fenoxaprop + safener) + Agri-Dex (1%)	0.08	4-5 LF	68	85	100	94	0	0	0	0	0
Cyhalofop-butyl + Agri-Dex (2.5%) + (acifluorfen + bentazon)	0.25	4-5 LF	66	70	93	76	100	93	100	100	100
Cyhalofop-butyl + Agri-Dex (2.5%) + bentazon	0.25	4-5 LF	34	55	100	88	71	58	97	99	55
Cyhalofop-butyl + Agri-Dex (2.5%) + acifluorfen	0.25	4-5 LF	45	68	82	45	96	78	88	85	76

continued

Table 74. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Broadleaf signalgrass (BRAPP)				Rice flatsedge (CYPIR)				Eclipta (ECLAL)
			6/12	6/17	7/12	8/2	6/12	6/17	7/12	8/2	8/2
			----- (%) -----								
Cyhalofop-butyl + Agri-Dex (2.5%) + triclopyr	0.25 0.38	4-5 LF	13	18	47	33	8	20	0	23	99
Cyhalofop-butyl + Agri-Dex (2.5%) + bensulfuron	0.25 0.063	4-5 LF	39	52	97	75	34	57	98	84	95
Cyhalofop-butyl + Agri-Dex (2.5%) + halosulfuron	0.25 0.063	4-5 LF	13	32	52	20	73	80	98	80	100
Cyhalofop-butyl + Agri-Dex (2.5%) + carfentrazone	0.25 0.02	4-5 LF	50	73	97	86	14	45	50	31	74
Cyhalofop-butyl + Agri-Dex (2.5%) + propanil	0.25 4.0	4-5 LF	95	85	98	100	31	58	67	65	78
Cyhalofop-butyl + Agri-Dex (2.5%)	0.25	4-5 LF	48	68	100	96	0	0	0	0	0
Clefoxydim + Agri-Dex (1%) + (acifluorfen + bentazon)	0.089 0.75	4-5 LF	94	90	100	100	100	93	100	100	95
Clefoxydim + Agri-Dex (1%) + bentazon	0.089 0.75	4-5 LF	87	90	100	100	89	73	100	100	80
Clefoxydim + Agri-Dex (1%) + acifluorfen	0.089 0.25	4-5 LF	61	82	97	95	93	85	91	88	58
Clefoxydim + Agri-Dex (1%) + triclopyr	0.089 0.38	4-5 LF	93	90	99	99	30	59	63	0	99
Clefoxydim + Agri-Dex (1%) + bensulfuron	0.089 0.063	4-5 LF	90	87	100	100	68	77	91	90	95
Clefoxydim + Agri-Dex (1%) + halosulfuron	0.089 0.063	4-5 LF	65	67	100	100	73	87	100	100	100
Clefoxydim + Agri-Dex (1%) + carfentrazone	0.089 0.02	4-5 LF	89	93	100	100	14	50	52	30	99

continued

Table 74. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Broadleaf signalgrass (BRAPP)				Rice flatsedge (CYPIR)				Eclipta (ECLAL)
			6/12	6/17	7/12	8/2	6/12	6/17	7/12	8/2	8/2
			----- (%) -----								
Clefoxydim + Agri-Dex (1%) + propanil	0.089 4.0	4-5 LF	99	85	96	100	36	62	75	65	85
Clefoxydim + Agri-Dex (1%)	0.089	4-5 LF	95	97	100	100	0	0	0	0	0
LSD (0.05)			17	10	12	17	20	8	20	27	19

continued

Table 74. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control							Yield 9/17 (lb/A)
			Barnyardgrass (ECHCG)		Amazon sprangletop (LEFPA)	Effect on rice				
			7/12	8/2	8/2	Injury				
Untreated check			0	0	0	0	0	0	0	2520
(Fenoxaprop + safener) + Agri-Dex (1%) + (acifluorfen + bentazon)	0.08 0.75	4-5 LF	71	64	85	28	8	0	0	7020
(Fenoxaprop + safener) + Agri-Dex (1%) + bentazon	0.08 0.75	4-5 LF	97	90	100	8	3	0	0	6660
(Fenoxaprop + safener) + Agri-Dex (1%) + acifluorfen	0.08 0.25	4-5 LF	78	71	95	36	11	0	0	7020
(Fenoxaprop + safener) + Agri-Dex (1%) + triclopyr	0.08 0.38	4-5 LF	73	66	92	16	8	0	0	5940
(Fenoxaprop + safener) + Agri-Dex (1%) + bensulfuron	0.08 0.063	4-5 LF	72	64	96	4	2	0	0	6570
(Fenoxaprop + safener) + Agri-Dex (1%) + halosulfuron	0.08 0.063	4-5 LF	72	39	98	5	5	0	0	6210

continued

Table 74. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control				Effect on rice				Yield 9/17 (lb/A)
			Barnyardgrass (ECHCG)		Amazon sprangletop (LEFPA)	Injury					
			7/12	8/2	8/2	6/12	6/17	7/12	8/2		
(Fenoxaprop + safener) + Agri-Dex (1%) + carfentrazone	0.08 0.02	4-5 LF	90	80	100	8	0	0	0	4770	
(Fenoxaprop + safener) + Agri-Dex (1%) + propanil	0.08 4.0	4-5 LF	57	0	98	14	7	0	0	6705	
(Fenoxaprop + safener) + Agri-Dex (1%)	0.08	4-5 LF	85	89	99	10	3	0	0	5445	
Cyhalofop-butyl + Agri-Dex (2.5%) + (acifluorfen + bentazon)	0.25 0.75	4-5 LF	72	60	65	28	11	0	0	6930	
Cyhalofop-butyl + Agri-Dex (2.5%) + bentazon	0.25 0.75	4-5 LF	71	65	49	5	1	0		6480	
Cyhalofop-butyl + Agri-Dex (2.5%) + acifluorfen	0.25 0.25	4-5 LF	71	56	79	39	11	0	0	6480	
Cyhalofop-butyl + Agri-Dex (2.5%) + triclopyr	0.25 0.38	4-5 LF	58	20	38	31	26	0	0	3375	
Cyhalofop-butyl + Agri-Dex (2.5%) + bensulfuron	0.25 0.063	4-5 LF	72	63	59	4	6	0	0	6435	
Cyhalofop-butyl + Agri-Dex (2.5%) + halosulfuron	0.25 0.063	4-5 LF	53	20	25	5	7	0	0	5580	
Cyhalofop-butyl + Agri-Dex (2.5%) + carfentrazone	0.25 0.02	4-5 LF	83	73	93	11	5	0	0	5400	
Cyhalofop-butyl + Agri-Dex (2.5%) + propanil	0.25 4.0	4-5 LF	61	0	100	10	3	0	0	6030	
Cyhalofop-butyl + Agri-Dex (2.5%)	0.25	4-5 LF	93	94	99	5	0	0	0	4815	
Clefoxydim + Agri-Dex (1%) + (acifluorfen + bentazon)	0.089 0.75	4-5 LF	95	100	84	55	23	0	0	7155	

continued

Table 74. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control							Yield 9/17 (lb/A)	
			Barnyardgrass (ECHCG)		Amazon sprangletop (LEFPA)		Effect on rice				
			7/12	8/2	8/2	Injury					
			6/12	6/17	7/12	8/2					
Clefoxydim + Agri-Dex (1%) + bentazon	0.089 0.75	4-5 LF	90	100	73	5	4	0	0	5895	
Clefoxydim + Agri-Dex (1%) + acifluorfen	0.089 0.25	4-5 LF	92	89	80	64	27	0	0	6615	
Clefoxydim + Agri-Dex (1%) + triclopyr	0.089 0.38	4-5 LF	82	99	100	56	23	0	0	6525	
Clefoxydim + Agri-Dex (1%) + bensulfuron	0.089 0.063	4-5 LF	100	100	96	61	40	0	0	6660	
Clefoxydim + Agri-Dex (1%) + halosulfuron	0.089 0.063	4-5 LF	96	98	63	50	30	0	0	6345	
Clefoxydim + Agri-Dex (1%) + carfentrazone	0.089 0.02	4-5 LF	100	99	99	54	38	0	0	5175	
Clefoxydim + Agri-Dex (1%) + propanil	0.089 4.0	4-5 LF	57	0	79	44	27	0	0	5535	
Clefoxydim + Agri-Dex (1%)	0.089	4-5 LF	100	100	100	61	55	3	0	2970	
LSD (0.05)			10	12	19	10	7	2	NS	1890	

Table 75. Comparison of imazethapyr (Pursuit) activity among several red rice accessions, IMI rice (AS 3510) and commercial rice, Stuttgart, 1999.

TEST INFORMATION

Location	Stuttgart	Planting date	May 25, 1999
Experimental Design / replications	Split plot / 3	Harvest date	July 30, 1999
Plot size	7 in. by 10 ft	Crop / Variety	Rice / Kaybonnet
Row width / Number of rows per plot	7 / 1 row	Date of flooding	June 28, 1999
Soil type	Crowley silt loam (8% sand, 75% silt, 16% clay)		
% OM / pH	1.3 / 5.5		

Comments: POST = postemergence. All plots were treated June 10 with propanil, 4.0 lb ai/A + quinclorac, 0.5 lb ai/A to control unwanted weeds.

Application type	POST
Date applied	6/15/99
Time	9:30 am
Incorporation equipment	N/A
Air temperature (F)	76
Relative humidity (%)	62
Wind (mph)	10
Weather	partly cloudy
Soil moisture	wet
Crop stage/Height	3-5 lf / 6-10"
Sprayer type/mph	BkPkCO ₂ / 2
Nozzle type/Size	Flat fan / 8001
Boom ht / # Noz / Spacing (in.)	20 / 3 / 20
Gpa / Psi	10 / 23

Conclusions: Several red rice accessions and rice types were evaluated for tolerance to three rates of imazethapyr (Pursuit). Rates of 0.063 and 0.125 lb/A controlled all red rice accessions at least 97% by late July (6 WAT). The 0.031 lb/A rate controlled the blackhull accessions 1995-10, 1995-8 from Arkansas, and TX4 from Texas to a level of 68, 63, and 70%, respectively, compared to 95% or greater control of other red rice accessions by this rate. At all rates, imazethapyr injured 'IMI-resistant' rice 28% or less, apparently stimulated production of new tillers, and also delayed heading and reduced plant height (data not shown). Kaybonnet white rice and Katy RR (a long-grain, presumed hybrid of rice and red rice) were as sensitive to imazethapyr as the most sensitive red rice accessions. The three slightly tolerant blackhull red rice accessions mentioned above have shown similar elevated tolerance to imazethapyr in previous field experiments. These results suggest that blackhull red rice types may possibly be slightly more tolerant to imazethapyr than are the strawhull red rice types (the StgS accession from Stuttgart, AR and Katy RR were the only strawhull types included in this study). If this is so, long-term production of IMI-rice with imazethapyr might tend to shift red rice populations more toward blackhull types.

Table 75.

Herbicide	Rate (lb/A)	Application timing	Plant number (no./m)	Plant height (cm)	Plant stage (leaf no.)	Control			Tiller density (no/m row)	Total dry weight (g/m row)
						6/28	7/13	7/27		
						----- (%) -----				
StgS										
Untreated			38.2	20.9	3.9	0	0	0	210.0	242.6
Imazethapyr	0.031	POST				48	100	98	2.3	0.5
Imazethapyr	0.063	POST				53	100	100	0.0	0.0
Imazethapyr	0.125	POST				62	100	98	2.0	0.2
StgB										
Untreated			30.0	24.1	4.1	0	0	0	220.3	177.8
Imazethapyr	0.031	POST				50	97	95	8.7	1.1
Imazethapyr	0.063	POST				53	100	100	0.0	0.0
Imazethapyr	0.125	POST				58	100	98	2.3	0.2
1995-10										
Untreated			34.5	24.6	4.1	0	0	0	139.7	163.1
Imazethapyr	0.031	POST				33	78	68	76.7	35.9
Imazethapyr	0.063	POST				47	97	100	0.0	0.0
Imazethapyr	0.125	POST				42	100	100	0.0	0.0
1995-8										
Untreated			30.9	20.7	3.7	0	0	0	195.3	149.6
Imazethapyr	0.031	POST				33	75	63	94.3	26.0
Imazethapyr	0.063	POST				45	100	100	0.0	0.0
Imazethapyr	0.125	POST				52	98	98	4.3	0.6
MS4										
Untreated			22.2	16.7	3.8	0	0	0	149.0	71.5
Imazethapyr	0.031	POST				43	95	98	7.3	1.1
Imazethapyr	0.063	POST				57	100	100	0.0	0.0
Imazethapyr	0.125	POST				58	100	100	0.0	0.0

continued

Table 75. Continued.

Herbicide	Rate (lb/A)	Application timing	Plant number (no./m)	Plant height (cm)	Plant stage (leaf no.)	Control			Tiller density (no/m row)	Total dry weight (g/m row)
						6/28	7/13	7/27		
						-----	(%)	-----		
TX4										
Untreated			28.3	23.5	4.0	0	0	0	203.0	175.4
Imazethapyr	0.031	POST				33	78	70	99.0	28.3
Imazethapyr	0.063	POST				53	100	100	0.0	0.0
Imazethapyr	0.125	POST				43	98	97	12.3	1.8
Kaybonnet										
Untreated			37.4	16.4	3.7	0	0	0	71.7	47.4
Imazethapyr	0.031	POST				58	98	98	2.0	0.6
Imazethapyr	0.063	POST				60	98	100	0.0	0.0
Imazethapyr	0.125	POST				65	100	100	0.0	0.0
Katy RR										
Untreated			32.2	17.0	3.9	0	0	0	121.0	71.6
Imazethapyr	0.031	POST				52	100	100	0.0	0.0
Imazethapyr	0.063	POST				60	100	100	0.0	0.0
Imazethapyr	0.125	POST				53	100	100	0.0	0.0
IMI-Resistant										
Untreated			22.7	16.4	3.7	0	0	0	47.3	118.6
Imazethapyr	0.031	POST				8	13	27	150.7	185.5
Imazethapyr	0.063	POST				20	13	28	114.7	144.2
Imazethapyr	0.125	POST				17	15	28	112.3	143.0
LSD (0.05)			7.5	1.6	0.2	15	5	8	39.5	51.4

Table 76. Sensitivity of red rice accessions to molinate PPI in a greenhouse study, Stuttgart, 1999.**TEST INFORMATION**

Procedures: One-quart plastic pots (4.5 in. deep by 4.5 in. diameter at the top) were filled with Crowley silt loam from the field. Pots were oversprayed with 4 or 8 lb ai/A molinate (Ordram 8E) using a CO₂ backpack sprayer (three - 8001 flat fan nozzles spaced 20 in. apart, 20 in. from soil surface; 23 psi) at 10 gpa water carrier. Soil was dumped into large tubs, mixed thoroughly, and put back into pots before planting seven seeds per pot at a depth of 0.5 in. on 21 July 1999. Pots were placed in a greenhouse at approximately 32 C (89 F) day and 25 C (77 F) night under natural light (approximately 13.5 hr. day length). Emergence of seedlings and visual control were observed. Plants were harvested for dry weight 4 weeks after treatment.

Conclusions: In previous field experiments we observed that certain white rice cultivars or lines (Indica types in particular) were much more sensitive to molinate (Ordram) than were the commercial white rice cultivars typically grown in Arkansas. Likewise, we have observed that red rice ecotypes differ in their susceptibility to glufosinate (Liberty) and imazethapyr (Pursuit). In this study, we evaluated sensitivity of numerous red rice ecotypes, a suspected rice x red rice hybrid, and several white rice cultivars to molinate at 4 and 8 lb ai/A, preplant incorporated (PPI). Red rice usually was more sensitive than commercial white rice cultivars, but two red rice lines (11D and 13A) were as tolerant as Kaybonnet to molinate at 8.0 lb/A. The suspected hybrid (Katy RR) was as tolerant as the most tolerant white rice lines and red rice ecotypes. The Indica white rice type, PI 312777, was as sensitive as the most sensitive red rice ecotypes.

Table 76.

Accession or cultivar	Molinate, 4 lb/A				Molinate, 8 lb/A				Untreated
	Emergence		Dry weight	Control 4 WAT	Emergence		Dry weight	Control 4 WAT	check Dry weight
	1 WAT	4 WAT			1 WAT	4 WAT			
	----- (% of UTC) -----			(%)	----- (% of UTC) -----			(%)	(g)
Strawhull types									
StgS	4	4	0	99	0	4	0	100	0.97
2B	2	2	2	91	0	0	0	100	1.13
3B	9	6	1	95	6	0	0	100	0.75
4A	12	4	4	85	0	0	0	100	0.73
7	2	7	1	96	4	4	0	99	0.94
9B	0	0	0	100	0	0	0	100	0.71
11B	4	6	6	84	0	0	0	100	0.80
11D	31	50	32	62	17	40	11	70	1.18
12B	19	58	36	51	0.91
13A	28	44	34	51	20	8	3	83	0.90
13G	2	0	0	100	0	4	1	95	0.83
14C	13	12	8	93	4	0	0	100	0.91
16B	8	0	0	100	0	0	0	100	0.81
16E	4	6	4	97	0	0	0	100	0.98
17A	2	2	0	99	0	0	0	100	0.88
20E	4	8	0	97	4	4	0	98	0.83
LA3	0	2	1	94	0	0	0	100	0.88

continued

Table 76. Continued.

Accession or cultivar	Molinate, 4 lb/A				Molinate, 8 lb/A				Untreated
	Emergence		Dry weight	Control 4 WAT	Emergence		Dry weight	Control 4 WAT	check
	1 WAT	4 WAT			1 WAT	4 WAT			Dry weight
----- (% of UTC) -----		----- (% of UTC) -----		----- (% of UTC) -----		----- (% of UTC) -----		(g)	
Blackhull types									
StgB	2	6	1	98	0	0	0	100	1.21
5A	10	25	9	77	12	0	0	100	0.76
8	22	44	15	66	0	4	1	91	0.91
10A	2	0	0	100	4	0	0	100	1.21
14F	8	2	1	93	0	0	0	100	1.17
17C	1	0	0	100	0	4	0	99	1.03
18E	0	2	0	98	0	0	0	100	0.68
1995-8	0	10	2	89	0	0	0	100	0.66
1995-10	2	4	2	87	11	4	4	99	1.12
MS4	4	6	3	98	4	0	0	100	0.65
TX4	5	2	1	94	5	0	0	100	0.81
White rice types									
Kaybonnet	56	71	41	51	15	13	4	80	0.60
M202	53	100	32	56	6	61	13	78	0.74
PI 312777	0	8	0	98	4	4	1	98	0.93
IMI.-Res.	44	63	28	61	0	16	5	89	0.79
Cross (suspected)									
Katy RR	64	74	41	44	12	24	11	73	0.83
LSD 0.05	17	17	9	13	17	17	9	13	--

Table 77. Grass control with fenoxaprop + safener (Ricestar), clefoxydim (Aura), and cyhalofop-butyl (Clincher), Lonoke, 1999.

TEST INFORMATION

Location	Lonoke	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 17, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Bengal
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.4 / 4.8		

Comments: 2-3 LF = 2-3 leaf rice; and PREFL = pre-flood.

Application type	2-3 LF	PREFL
Date applied	6/2/99	6/9/99
Time	9:40 am	5:25 pm
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	73 / 68	98 / 80
Relative humidity (%)	88	36
Wind (mph)	2	6
Weather	cloudy	mostly cloudy
Soil moisture	moist	moist
Crop stage/Height	3 lf / 7"	early tillering / 11"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	18 / 6 / 20	21 / 6 / 20
Gpa / Psi	10 / 12	10 / 22
Weed species	----- [leaves/height (in.)] -----	
BRAPP	4 lf / 1.5"	4 tiller / 9"
MOLVE	7 lf	N/A
CYPCP	5 lf / 1"	N/A
R-ECHCG	3 lf / 4"	4 lf / 8"
ECHCG	4 lf / 3 "	1 tiller / 8-12"

Conclusions: Most early treatments and sequential treatments provided excellent control. Most of the PREFL treatments, especially cyhalofop-butyl (Clincher), provided control lower than expected, indicating these herbicides may not control grasses over as broad a range of growth stages as hoped.

Table 77. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Barnyardgrass (ECHCG)								Amazon sprangletop (LEFPA)
			Resistant				Susceptible				
			6/10	6/17	7/12	8/2	6/10	6/17	7/12	8/2	
Untreated check			0	0	0	0	0	0	0	0	
(Fenoxaprop + safener) + Agri-Dex (1%)	0.04	2-3 LF	35	50	71	68	51	65	80	74	100
(Fenoxaprop + safener) + Agri-Dex (1%)	0.06	2-3 LF	44	66	90	85	56	84	95	90	100
(Fenoxaprop + safener) + Agri-Dex (1%)	0.08	2-3 LF	61	78	100	98	63	93	98	98	100
Cyhalofop-butyl + Agri-Dex (2.5%)	0.125	2-3 LF	29	50	89	78	29	51	83	75	94
Cyhalofop-butyl + Agri-Dex (2.5%)	0.188	2-3 LF	38	51	100	93	38	54	99	93	100
Cyhalofop-butyl + Agri-Dex (2.5%)	0.25	2-3 LF	48	65	100	95	41	71	100	99	100
Clefoxydim + Agri-Dex (1%)	0.0445	2-3 LF	51	58	80	66	49	69	76	65	63
Clefoxydim + Agri-Dex (1%)	0.067	2-3 LF	58	70	86	75	68	79	84	75	71
Clefoxydim + Agri-Dex (1%)	0.089	2-3 LF	60	80	91	84	69	88	100	90	100
(Fenoxaprop + safener) + Agri-Dex (1%)	0.04	PREFL	0	30	65	45	0	30	60	45	100
(Fenoxaprop + safener) + Agri-Dex (1%)	0.06	PREFL	0	32	78	58	0	32	72	58	100
(Fenoxaprop + safener) + Agri-Dex (1%)	0.08	PREFL	0	33	69	58	0	33	65	55	100
Cyhalofop-butyl + Agri-Dex (2.5%)	0.125	PREFL	0	20	51	43	0	20	51	43	45
Cyhalofop-butyl + Agri-Dex (2.5%)	0.188	PREFL	0	24	65	50	0	24	59	50	55
Cyhalofop-butyl + Agri-Dex (2.5%)	0.25	PREFL	0	20	71	63	0	20	71	63	70
Clefoxydim + Agri-Dex (1%)	0.0445	PREFL	0	30	71	49	0	43	66	46	75
Clefoxydim + Agri-Dex (1%)	0.067	PREFL	0	33	75	60	0	33	69	56	84
Clefoxydim + Agri-Dex (1%)	0.089	PREFL	0	34	84	69	0	34	75	63	93

continued

Table 77. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control								Amazon sprangletop (LEFPA) 8/2
			Barnyardgrass (ECHCG)								
			Resistant				Susceptible				
			6/10	6/17	7/12	8/2	6/10	6/17	7/12	8/2	
(Fenoxaprop + safener) + Agri-Dex (1%) <i>fb</i>	0.04	2-3 LF	-----								
(fenoxaprop + safener) + Agri-Dex (1%)	0.04	PREFL	33	56	79	65	38	55	76	64	93
(Fenoxaprop + safener) + Agri-Dex (1%) <i>fb</i>	0.06	2-3 LF	-----								
(fenoxaprop + safener) + Agri-Dex (1%)	0.06	PREFL	44	68	98	81	50	74	95	83	100
(Fenoxaprop + safener) + Agri-Dex (1%) <i>fb</i>	0.08	2-3 LF	-----								
(fenoxaprop + safener) + Agri-Dex (1%)	0.08	PREFL	46	70	99	94	41	73	99	93	100
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.125	2-3 LF	-----								
cyhalofop-butyl + Agri-Dex (2.5%)	0.125	PREFL	38	59	99	99	29	63	100	100	93
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.188	2-3 LF	-----								
cyhalofop-butyl + Agri-Dex (2.5%)	0.188	PREFL	43	65	100	100	38	65	100	100	100
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.25	2-3 LF	-----								
cyhalofop-butyl + Agri-Dex (2.5%)	0.25	PREFL	43	65	100	100	33	68	100	100	100
Clefoxydim + Agri-Dex (1%) <i>fb</i>	0.0445	2-3 LF	-----								
clefoxydim + Agri-Dex (1%)	0.0445	PREFL	48	73	83	79	45	75	80	75	100
Clefoxydim + Agri-Dex (1%) <i>fb</i>	0.067	2-3 LF	-----								
clefoxydim + Agri-Dex (1%)	0.067	PREFL	58	93	100	99	73	95	100	99	100
Clefoxydim + Agri-Dex (1%) <i>fb</i>	0.089	2-3 LF	-----								
clefoxydim + Agri-Dex (1%)	0.089	PREFL	75	96	100	100	80	96	100	100	100
LSD (0.05)			13	12	10	11	16	14	8	11	16

continued

Table 77. Section 2.

Herbicide	Rate (lb/A)	Application timing	Broadleaf signalgrass (BRAPP) control				Effect on rice				Yield 9/17
			6/10	6/17	7/12	8/2	Injury				
							6/10	6/17	7/12	8/2	
Untreated check			0	0	0	0	0	0	0	0	2970
(Fenoxaprop + safener) + Agri-Dex (1%)	0.04	2-3 LF	98	78	100	100	13	3	0	0	7110
(Fenoxaprop + safener) + Agri-Dex (1%)	0.06	2-3 LF	100	86	100	100	14	5	0	0	7380
(Fenoxaprop + safener) + Agri-Dex (1%)	0.08	2-3 LF	100	93	100	100	13	6	3	0	7380
Cyhalofop-butyl + Agri-Dex (2.5%)	0.125	2-3 LF	30	64	100	100	1	0	0	0	7020
Cyhalofop-butyl + Agri-Dex (2.5%)	0.188	2-3 LF	38	75	100	100	5	0	0	0	6300
Cyhalofop-butyl + Agri-Dex (2.5%)	0.25	2-3 LF	70	81	100	100	6	3	0	0	7740
Clefoxydim + Agri-Dex (1%)	0.0445	2-3 LF	44	68	100	63	5	3	0	0	6975
Clefoxydim + Agri-Dex (1%)	0.067	2-3 LF	46	70	100	76	8	1	0	0	6120
Clefoxydim + Agri-Dex (1%)	0.089	2-3 LF	90	90	100	100	20	9	0	0	6750
(Fenoxaprop + safener) + Agri-Dex (1%)	0.04	PREFL	0	35	100	93	0	5	0	0	4230
(Fenoxaprop + safener) + Agri-Dex (1%)	0.06	PREFL	0	38	100	100	0	3	0	0	6705
(Fenoxaprop + safener) + Agri-Dex (1%)	0.08	PREFL	0	46	100	100	0	4	0	0	6390
Cyhalofop-butyl + Agri-Dex (2.5%)	0.125	PREFL	0	20	100	85	0	3	0	0	4680
Cyhalofop-butyl + Agri-Dex (2.5%)	0.188	PREFL	0	24	100	100	0	3	0	0	6985
Cyhalofop-butyl + Agri-Dex (2.5%)	0.25	PREFL	0	20	100	100	0	5	0	0	6525
Clefoxydim + Agri-Dex (1%)	0.0445	PREFL	0	30	100	63	0	9	0	0	6345
Clefoxydim + Agri-Dex (1%)	0.067	PREFL	0	33	100	73	0	6	0	0	6660
Clefoxydim + Agri-Dex (1%)	0.089	PREFL	0	34	100	90	0	10	0	0	7065

continued

Table 77. Section 2.

Herbicide	Rate (lb/A)	Application timing	Broadleaf signalgrass (BRAPP) control				Effect on rice				Yield 9/17
			6/10	6/17	7/12	8/2	Injury				
							6/10	6/17	7/12	8/2	
(Fenoxaprop + safener) + Agri-Dex (1%) <i>fb</i>	0.04	2-3 LF					----- (%) -----				
(fenoxaprop + safener) + Agri-Dex (1%)	0.04	PREFL	99	91	100	100	13	6	0	0	6705
(Fenoxaprop + safener) + Agri-Dex (1%) <i>fb</i>	0.06	2-3 LF					----- (%) -----				
(fenoxaprop + safener) + Agri-Dex (1%)	0.06	PREFL	99	93	100	100	10	1	0	0	6840
(Fenoxaprop + safener) + Agri-Dex (1%) <i>fb</i>	0.08	2-3 LF					----- (%) -----				
(fenoxaprop + safener) + Agri-Dex (1%)	0.08	PREFL	99	90	100	100	10	5	0	0	6750
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.125	2-3 LF					----- (%) -----				
cyhalofop-butyl + Agri-Dex (2.5%)	0.125	PREFL	43	70	100	100	6	1	0	0	6975
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.188	2-3 LF					----- (%) -----				
cyhalofop-butyl + Agri-Dex (2.5%)	0.188	PREFL	54	94	100	100	9	4	0	0	7155
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.25	2-3 LF					----- (%) -----				
cyhalofop-butyl + Agri-Dex (2.5%)	0.25	PREFL	73	85	100	100	3	0	0	0	7065
Clefoxydim + Agri-Dex (1%) <i>fb</i>	0.0445	2-3 LF					----- (%) -----				
clefoxydim + Agri-Dex (1%)	0.0445	PREFL	58	89	100	100	8	3	0	0	7155
Clefoxydim + Agri-Dex (1%) <i>fb</i>	0.067	2-3 LF					----- (%) -----				
clefoxydim + Agri-Dex (1%)	0.067	PREFL	95	91	100	100	13	8	0	0	7290
Clefoxydim + Agri-Dex (1%) <i>fb</i>	0.089	2-3 LF					----- (%) -----				
clefoxydim + Agri-Dex (1%)	0.089	PREFL	99	96	100	100	18	19	0	0	7245
LSD (0.05)			18	11	1	11	6	6	1	NS	1035

Table 78. Grass control with fenoxaprop + safener (Ricestar), clefoxydim (Aura), and cyhalofop-butyl (Clincher), Stuttgart, 1999.

TEST INFORMATION

Location	Stuttgart	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 6, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Drew
Row width / Number of rows per plot	6.5 in. / 9 rows	Dates of flushing	May 25, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of Flooding	July 2, 1999
% OM / pH	1.4 / 4.8		

Comments: 2-3 LF = 2-3 leaf rice.

Application type	2-3 LF	PREFL
Date applied	6/2/99	6/18
Time	1:30 pm	7:00 am
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	82 / 86	69 / 70
Relative humidity (%)	82	66
Wind (mph)	2	3
Weather	partly cloudy	N/A
Soil moisture	excessive	moist
Crop stage/Height	2-3 lf / 6"	2 tiller / 11"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	XR Teejet / 11001VS	XR Teejet / 11001VS
Boom ht / # Noz / Spacing (in.)	19 / 6 / 20	15 / 6 / 20
Gpa / Psi	10 / 41	10 / 42
Weed species	----- [# leaves/height (in.)] -----	
R-ECHCG	2-3 lf / 1.5"	4-6 lf, 3 tiller / 8-10"
ECHCG	2 lf / 0.5-0.75"	4-6 lf / 6-8"
BRAPP	3-4 lf / 3-5"	5-9 lf / 3-7"

Conclusions: This protocol had three different rates at three different timings. At the 2-3 LF timing, fenoxaprop + safener (Ricestar) from 0.04 to 0.08 lb ai/A looked excellent for broadleaf signalgrass and barnyardgrass (propanil-resistant and -susceptible) control. Cyhalofop-butyl (Clincher) at 0.125 to 0.25 lb ai/A and clefoxydim (Aura) at 0.67 to 0.89 lb ai/A also looked excellent for broadleaf signalgrass and barnyardgrass control. At the PREFL timing, none of the fenoxaprop + safener, cyhalofop-butyl, or clefoxydim treatments looked acceptable for barnyardgrass control. Broadleaf signalgrass control with fenoxaprop + safener at 0.04 to 0.08 lb ai/A and cyhalofop at 0.188 to 0.25 lb ai/A was excellent. However, clefoxydim did not give adequate control of broadleaf signalgrass control even at the 0.089 lb ai/A rate. Two applications (2-3 LF and PREFL) of fenoxaprop + safener at 0.04 lb ai/A or higher provided excellent control of broadleaf signalgrass and barnyardgrass. Excellent control of broadleaf signalgrass and barnyardgrass was also achieved with two applications of cyhalofop-butyl at 0.125 lb ai/A or higher and clefoxydim at 0.067 lb ai/A or higher.

Table 78. Section 1.

Herbicide	Rate	Application timing (lb/A)	Barnyardgrass (ECHCG) control										
			Resistant					Susceptible					
			6/11	6/18	6/23	7/14	8/11	6/11	6/18	6/23	7/14	8/11	
Untreated check			0	0	0	0	0	0	0	0	0	0	0
(Fenoxaprop + safener) + Agri-Dex (1%)	0.04	2-3 LF	68	79	94	96	94	90	80	85	95	94	
(Fenoxaprop + safener) + Agri-Dex (1%)	0.06	2-3 LF	66	86	94	100	99	89	89	89	99	99	
(Fenoxaprop + safener) + Agri-Dex (1%)	0.08	2-3 LF	84	89	95	100	93	100	83	83	100	93	
Cyhalofop-butyl + Agri-Dex (2.5%)	0.125	2-3 LF	50	69	93	100	95	60	68	85	100	95	
Cyhalofop-butyl + Agri-Dex (2.5%)	0.188	2-3 LF	40	69	93	95	93	51	66	79	95	93	
Cyhalofop-butyl + Agri-Dex (2.5%)	0.25	2-3 LF	40	74	91	98	100	50	68	78	98	100	
Clefoxydim + Agri-Dex (1%)	0.0445	2-3 LF	50	68	80	74	74	51	63	69	74	74	
Clefoxydim + Agri-Dex (1%)	0.067	2-3 LF	88	94	93	99	86	90	78	79	96	86	
Clefoxydim + Agri-Dex (1%)	0.089	2-3 LF	89	94	95	100	93	100	85	80	95	93	
(Fenoxaprop + safener) + Agri-Dex (1%)	0.04	PREFL	0	0	30	39	38	0	0	30	39	38	
(Fenoxaprop + safener) + Agri-Dex (1%)	0.06	PREFL	0	0	30	45	45	0	0	30	45	45	
(Fenoxaprop + safener) + Agri-Dex (1%)	0.08	PREFL	0	0	30	56	50	0	0	30	56	50	
Cyhalofop-butyl + Agri-Dex (2.5%)	0.125	PREFL	0	0	30	43	30	0	0	30	43	30	
Cyhalofop-butyl + Agri-Dex (2.5%)	0.188	PREFL	0	0	30	50	48	0	0	30	50	48	
Cyhalofop-butyl + Agri-Dex (2.5%)	0.25	PREFL	0	0	30	56	58	0	0	30	56	58	
Clefoxydim + Agri-Dex (1%)	0.0445	PREFL	0	0	30	48	51	0	0	30	54	51	
Clefoxydim + Agri-Dex (1%)	0.067	PREFL	0	0	30	59	55	0	0	30	59	55	
Clefoxydim + Agri-Dex (1%)	0.089	PREFL	0	0	30	60	56	0	0	30	60	56	

continued

Table 78. Section 1. Continued.

Herbicide	Rate	Application timing (lb/A)	Barnyardgrass (ECHCG) control										
			Resistant					Susceptible					
			6/11	6/18	6/23	7/14	8/11	6/11	6/18	6/23	7/14	8/11	
(Fenoxaprop + safener) + Agri-Dex (1%) <i>fb</i>	0.04	2-3 LF											
(fenoxaprop + safener) + Agri-Dex (1%)	0.04	PREFL	50	70	93	100	100	61	76	85	100	100	
(Fenoxaprop + safener) + Agri-Dex (1%) <i>fb</i>	0.06	2-3 LF											
(fenoxaprop + safener) + Agri-Dex (1%)	0.06	PREFL	68	85	95	100	100	88	85	89	100	100	
(Fenoxaprop + safener) + Agri-Dex (1%) <i>fb</i>	0.08	2-3 LF											
(fenoxaprop + safener) + Agri-Dex (1%)	0.08	PREFL	71	90	95	100	100	83	84	89	100	100	
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.125	2-3 LF											
cyhalofop-butyl + Agri-Dex (2.5%)	0.125	PREFL	45	61	90	100	100	48	60	85	100	100	
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.188	2-3 LF											
cyhalofop-butyl + Agri-Dex (2.5%)	0.188	PREFL	48	70	94	100	100	56	63	84	100	100	
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.25	2-3 LF											
cyhalofop-butyl + Agri-Dex (2.5%)	0.25	PREFL	50	68	93	100	100	56	65	80	100	100	
Clefoxydim + Agri-Dex (1%) <i>fb</i>	0.0445	2-3 LF											
clefoxydim + Agri-Dex (1%)	0.0445	PREFL	53	69	91	86	89	71	69	83	88	89	
Clefoxydim + Agri-Dex (1%) <i>fb</i>	0.067	2-3 LF											
clefoxydim + Agri-Dex (1%)	0.067	PREFL	83	95	95	100	99	86	85	86	100	99	
Clefoxydim + Agri-Dex (1%) <i>fb</i>	0.089	2-3 LF											
clefoxydim + Agri-Dex (1%)	0.089	PREFL	98	95	95	100	100	98	83	90	100	100	
LSD (0.05)			12	9	5	10	13	14	11	7	11	13	

continued

Table 78. Section 2.

Herbicide	Rate (lb/A)	Application timing	Broadleaf signalgrass (BRAPP) control					Effect on rice					Yield 9/6 (lb/A)
			6/11	6/18	6/23	7/14	8/11	Injury					
			----- (%) -----					6/11	6/18	6/23	7/14	8/11	
Untreated check			0	0	0	0	0	0	0	0	0	0	2913
(Fenoxaprop + safener) + Agri-Dex (1%)	0.04	2-3 LF	89	81	84	99	100	18	0	0	0	0	8265
(Fenoxaprop + safener) + Agri-Dex (1%)	0.06	2-3 LF	100	86	90	100	100	21	0	0	0	0	7707
(Fenoxaprop + safener) + Agri-Dex (1%)	0.08	2-3 LF	100	74	81	100	100	23	0	0	0	0	9224
Cyhalofop-butyl + Agri-Dex (2.5%)	0.125	2-3 LF	66	68	84	100	100	8	0	0	0	0	7795
Cyhalofop-butyl + Agri-Dex (2.5%)	0.188	2-3 LF	54	70	81	99	100	6	0	0	0	0	7986
Cyhalofop-butyl + Agri-Dex (2.5%)	0.25	2-3 LF	53	66	76	100	100	6	0	0	0	0	8600
Clefoxydim + Agri-Dex (1%)	0.0445	2-3 LF	66	61	74	90	88	5	1	0	0	0	7738
Clefoxydim + Agri-Dex (1%)	0.067	2-3 LF	91	70	83	100	100	39	3	0	0	0	7349
Clefoxydim + Agri-Dex (1%)	0.089	2-3 LF	100	85	80	100	100	46	1	0	0	0	7815
(Fenoxaprop + safener) + Agri-Dex (1%)	0.04	PREFL	0	0	30	93	96	0	0	0	0	0	5454
(Fenoxaprop + safener) + Agri-Dex (1%)	0.06	PREFL	0	0	30	96	95	0	0	0	0	0	5581
(Fenoxaprop + safener) + Agri-Dex (1%)	0.08	PREFL	0	0	30	96	99	0	0	0	0	0	6296
Cyhalofop-butyl + Agri-Dex (2.5%)	0.125	PREFL	0	0	30	98	70	0	0	0	0	0	4489
Cyhalofop-butyl + Agri-Dex (2.5%)	0.188	PREFL	0	0	30	95	90	0	0	0	0	0	5403
Cyhalofop-butyl + Agri-Dex (2.5%)	0.25	PREFL	0	0	30	95	99	0	0	0	0	0	5289
Clefoxydim + Agri-Dex (1%)	0.0445	PREFL	0	0	30	76	61	0	0	0	0	0	6577
Clefoxydim + Agri-Dex (1%)	0.067	PREFL	0	0	30	75	70	0	0	0	0	0	5898
Clefoxydim + Agri-Dex (1%)	0.089	PREFL	0	0	30	69	63	0	0	0	0	0	5981

continued

Table 78. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Broadleaf signalgrass (BRAPP) control					Effect on rice					Yield 9/6 (lb/A)
			6/11	6/18	6/23	7/14	8/11	Injury					
			----- (%) -----					6/11	6/18	6/23	7/14	8/11	
(Fenoxaprop + safener) + Agri-Dex (1%) <i>fb</i>	0.04	2-3 LF											
(fenoxaprop + safener) + Agri-Dex (1%)	0.04	PREFL	65	70	85	100	100	14	0	0	0	0	8237
(Fenoxaprop + safener) + Agri-Dex (1%) <i>fb</i>	0.06	2-3 LF											
(fenoxaprop + safener) + Agri-Dex (1%)	0.06	PREFL	94	81	88	100	100	19	0	0	0	0	8268
(Fenoxaprop + safener) + Agri-Dex (1%) <i>fb</i>	0.08	2-3 LF											
(fenoxaprop + safener) + Agri-Dex (1%)	0.08	PREFL	88	80	88	100	100	24	0	0	0	0	8248
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.125	2-3 LF											
cyhalofop-butyl + Agri-Dex (2.5%)	0.125	PREFL	60	68	88	100	100	9	0	0	0	0	8217
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.188	2-3 LF											
cyhalofop-butyl + Agri-Dex (2.5%)	0.188	PREFL	60	65	83	100	100	4	0	0	0	0	8232
Cyhalofop-butyl + Agri-Dex (2.5%) <i>fb</i>	0.25	2-3 LF											
cyhalofop-butyl + Agri-Dex (2.5%)	0.25	PREFL	69	65	81	100	100	4	0	0	0	0	8013
Clefoxydim + Agri-Dex (1%) <i>fb</i>	0.0445	2-3 LF											
clefoxydim + Agri-Dex (1%)	0.0445	PREFL	63	65	80	93	90	4	1	0	0	0	7804
Clefoxydim + Agri-Dex (1%) <i>fb</i>	0.067	2-3 LF											
clefoxydim + Agri-Dex (1%)	0.067	PREFL	81	83	85	100	100	35	3	0	0	0	7362
Clefoxydim + Agri-Dex (1%) <i>fb</i>	0.089	2-3 LF											
clefoxydim + Agri-Dex (1%)	0.089	PREFL	98	78	88	100	100	41	0	0	0	0	7839
LSD (0.05)			19	10	7	7	13	6	2	0	0	0	1525

Table 79. Program approach using grass herbicides, Lonoke, 1999.**TEST INFORMATION**

Location	Lonoke	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 17, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Bengal
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.4 / 4.8		

Comments: 2-3 LF = 2-3 leaf rice; and PREFL = pre flood.

Application type	2-3 LF	PREFL
Date applied	6/2/99	6/14/99
Time	11:10 am	9:45 am
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	74 / 68	77 / 76
Relative humidity (%)	91	82
Wind (mph)	0	6
Weather	cloudy	cloudy
Soil moisture	saturated	moist
Crop stage/Height	4 lf / 6"	2 tiller / 12"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	18 / 6 / 20	24 / 6 / 20
Gpa / Psi	10 / 12	10 / 12
Weed species	----- [# leaves/height (in.)] -----	
BRAPP	6 lf / 3"	N/A
MOLVE	7 lf	N/A
CYPIR	5 lf / 1"	N/A
CYPCP	N/A	5 lf / 4.5"

Conclusions: Good grass control was achieved with most treatments. Good overall weed control was achieved when grass and broadleaf herbicides were combined in a program approach. Severe early injury occurred with some of the clefoxydim tank mixtures.

Table 79. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Broadleaf signalgrass (BRAPP)				Rice flatsedge (CYPIR)				Amazon sprangletop (LEFPA)
			6/10	6/17	7/12	8/2	6/10	6/17	7/12	8/2	8/2
Untreated check			0	0	0	0	0	0	0	0	0
(Fenoxaprop + safener) + Agri-Dex (1%)	0.06	2-3 LF	94	95	100	100	0	0	0	0	78
Cyhalofop-butyl + Agri-Dex (2.5%)	0.188	2-3 LF	89	84	100	100	0	0	0	0	96
Clefoxydim + Agri-Dex (1%)	0.067	2-3 LF	83	95	100	97	2	1	1	0	96
(Fenoxaprop + safener) + Agri-Dex (1%) + pendimethalin	0.06 1.0	2-3 LF	86	93	100	100	0	0	0	0	99
Cyhalofop-butyl + Agri-Dex (2.5%) + pendimethalin	0.188 1.0	2-3 LF	76	79	100	100	0	0	65	35	77
Clefoxydim + Agri-Dex (1%) + pendimethalin	0.067 1.0	2-3 LF	85	84	100	100	0	13	25	25	99
(Fenoxaprop + safener) + Agri-Dex (1%) + thiobencarb	0.06 3.0	2-3 LF	95	89	100	100	25	43	65	75	100
Cyhalofop-butyl + Agri-Dex (2.5%) + thiobencarb	0.188 3.0	2-3 LF	85	83	100	98	13	40	55	85	94
Clefoxydim + Agri-Dex (1%) + thiobencarb	0.067 3.0	2-3 LF	83	94	100	100	0	43	60	21	96
Propanil <i>fb</i> (fenoxaprop + safener) + Agri-Dex (1%)	3.0 0.06	2-3 LF PREFL	100	95	100	100	83	94	100	100	100
Propanil <i>fb</i> cyhalofop-butyl + Agri-Dex (2.5%)	3.0 0.188	2-3 LF PREFL	99	94	100	100	78	96	100	100	100
Propanil <i>fb</i> clefoxydim + Agri-Dex (1%)	3.0 0.067	2-3 LF PREFL	99	94	100	100	76	91	100	100	100
(Propanil + molinate) <i>fb</i> (fenoxaprop + safener) + Agri-Dex (1%)	4.5 0.06	2-3 LF PREFL	100	95	100	100	81	95	100	100	100

continued

Table 79. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Broadleaf signalgrass (BRAPP)				Rice flatsedge (CYPIR)				Amazon sprangletop (LEFPA)
			6/10	6/17	7/12	8/2	6/10	6/17	7/12	8/2	8/2
			----- (%) -----								
(Propanil + molinate) fb	4.5	2-3 LF									
cyhalofop-butyl + Agri-Dex (2.5%)	0.188	PREFL	100	95	100	100	93	100	100	98	100
(Propanil + molinate) fb	4.5	2-3 LF									
clefoxydim + Agri-Dex (1%)	0.067	PREFL	100	95	100	100	91	99	100	100	100
Propanil + quinclorac	3.0 0.25	2-3 LF	100	95	100	100	88	98	100	100	100
LSD (0.05)			9	6	0	2	15	20	28	28	23

continued

Table 79. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Barnyardgrass (ECHCG)			Eclipta (ECLAL)	Effect on rice				
			6/17	7/12	8/2	8/2	Injury				Yield
			----- (%) -----								
Untreated check			0	0	0	0	0	0	0	0	3195
(Fenoxaprop + safener) + Agri-Dex (1%)	0.06	2-3 LF	95	98	98	0	10	9	5	0	6075
Cyhalofop-butyl + Agri-Dex (2.5%)	0.188	2-3 LF	89	96	95	0	5	9	4	0	5985
Clefoxydim + Agri-Dex (1%)	0.067	2-3 LF	95	97	97	2	12	14	0	0	6210
(Fenoxaprop + safener) + Agri-Dex (1%) + pendimethalin	0.06 1.0	2-3 LF	94	96	98	78	6	15	4	0	5895
Cyhalofop-butyl + Agri-Dex (2.5%) + pendimethalin	0.188 1.0	2-3 LF	84	100	99	75	5	9	0	0	6435
Clefoxydim + Agri-Dex (1%) + pendimethalin	0.067 1.0	2-3 LF	85	93	100	74	66	24	8	0	5985

continued

Table 79. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control				Effect on rice				Yield 8/2 (lb/A)
			Barnyardgrass (ECHCG)			Eclipta (ECLAL)	Injury				
			6/17	7/12	8/2	8/2 (%)	6/10	6/17	7/12	8/2	
(Fenoxaprop + safener) + Agri-Dex (1%) + thiobencarb	0.06 3.0	2-3 LF	90	85	81	25	4	9	0	0	5895
Cyhalofop-butyl + Agri-Dex (2.5%) + thiobencarb	0.188 3.0	2-3 LF	86	81	78	0	0	6	3	0	6030
Clefoxydim + Agri-Dex (1%) + thiobencarb	0.067 3.0	2-3 LF	95	99	94	0	78	30	14	0	5850
Propanil <i>fb</i> (fenoxaprop + safener) + Agri-Dex (1%)	3.0 0.06	2-3 LF PREFL	53	96	98	100	0	0	0	0	6795
Propanil <i>fb</i> cyhalofop-butyl + Agri-Dex (2.5%)	3.0 0.188	2-3 LF PREFL	54	99	91	100	0	0	0	0	6480
Propanil <i>fb</i> clefoxydim + Agri-Dex (1%)	3.0 0.067	2-3 LF PREFL	50	80	75	100	4	0	0	0	6570
(Propanil + molinate) <i>fb</i> (fenoxaprop + safener) + Agri-Dex (1%)	4.5 0.06	2-3 LF PREFL	50	96	100	100	0	0	0	0	6390
(Propanil + molinate) <i>fb</i> cyhalofop-butyl + Agri-Dex (2.5%)	4.5 0.188	2-3 LF PREFL	56	100	98	100	0	0	0	0	6300
(Propanil + molinate) <i>fb</i> clefoxydim + Agri-Dex (1%)	4.5 0.067	2-3 LF PREFL	55	80	69	100	3	3	0	0	6435
Propanil + quinclorac	3.0 0.25	2-3 LF	95	100	100	100	4	0	0	0	6300
LSD (0.05)			6	8	10	30	6	6	6	NS	630

Table 80. Post-flood grass control, Lonoke, 1999.

TEST INFORMATION

Location	Lonoke	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 17, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Bengal
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.4 / 4.8		

Comments: POFL = post flood.

Application type	POFL
Date applied	6/21/99
Time	5:00 pm
Incorporation equipment	N/A
Air/Soil temperature (F)	93 / 80
Relative humidity (%)	33
Wind (mph)	5
Weather	clear
Soil moisture	flooded
Crop stage/Height	3 tiller / 15"
Sprayer type/mph	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	25 / 6 / 20
Gpa / Psi	10 / 16
Weed species	[# leaves/height (in.)]
BRAPP	4 tiller / 12"
CYPCP	4 lf / 10"

Conclusions: No treatments for grass control were applied with the POFL salvage stage. Cyhalofop-butyl (Clincher) was the only treatment that provided acceptable control and it was outstanding.

Table 80.

Herbicide	Rate (lb/A)	Application timing	Weed control						
			Broadleaf signalgrass (BRAPP)		Barnyardgrass (ECHCG)		Effect on rice		Yield 9/17 (lb/A)
			7/12	8/2	7/12	8/2	Injury		
			----- (%) -----						7/12
Untreated check			0	0	0	0	0	0	2745
(Fenoxaprop + safener) + Agri-Dex (1%)	0.08	POFL	88	80	48	38	0	0	4860
Cyhalofop-butyl + Agri-Dex (2.5%)	0.25	POFL	100	100	88	98	0	0	6390
Clefoxydim + Agri-Dex (1%)	0.089	POFL	13	23	50	28	0	0	3870
Bispyribac-sodium + Kinetic (0.125%)	0.019	POFL	0	8	64	79	0	0	2565
Propanil	4.0	POFL	55	38	48	38	0	0	4410
(Propanil + molinate)	6.0	POFL	54	33	48	33	0	0	4455
LSD (0.05)			18	15	33	24	NS	NS	630

Table 81. Clefoxydim (Aura) for annual grass control, Rohwer, 1999.

TEST INFORMATION

Location	Rohwer	Planting date	May 12, 1999
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	5 ft by 17 ft	Crop / Variety	Rice / Lemont
Row width / Number of rows per plot	6 in. / 8 rows	Dates of flushing	April 26, May 4, 11, and 27, 1999
Soil type	clay loam (8% sand, 49% silt, 43% clay)	Date of flooding	June 11, 1999
% OM / pH	3.5 / 6.7		

Comments: EPOST = early postemergence; and PI = panicle initiation.

Application type	EPOST	PI
Date applied	5/17/99	6/19/99
Time	8:30 am	9:45 am
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	79 / 78	75 / 75
Relative humidity (%)	61	65
Wind (mph)	7	N/A
Weather	partly cloudy	N/A
Crop stage/Height	2-3 lf / 3"	4-5 lf / 6"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Flat fan / 8002	Flat fan / 8002
Boom ht / # Noz / Spacing (in.)	22 / 3 / 19	22 / 3 / 19
Gpa / Psi	15 / 22	15 / 25
Weed species	----- (# leaves) -----	
IPOLA	2-3 lf	4-5 lf
SEBEX	2-3 lf	4-5 lf
ECHCG	2-3 lf	4-5 lf

Conclusions: There was no injury from EPOST or PREFL treatments. Clefoxydim (Aura) and fenoxaprop + safener (Ricestar) applied POST provided greater than 95% control of barnyardgrass. PREFL applications were too late to provide barnyardgrass control. EPOST treatments that included triclopyr (Grandstand) did not control hemp sesbania. PREFL treatments with triclopyr controlled hemp sesbania 100%.

Table 81. Section 1.

Herbicide	Rate	Application timing (lb/A)	Weed control			
			Pitted morningglory (IPOLA)		Hemp sesbania (SEBEX)	
			6/7	6/7	7/2	7/14
			----- (%) -----			
Untreated check			0	0	0	0
Clefoxydim + Agri-Dex (0.25%)	0.067	EPOST	0	0	5	0
Clefoxydim + Agri-Dex (0.25%)	0.094	PI	0	0	0	0
(Fenoxaprop + safener)	0.045	EPOST	0	0	0	13
(Fenoxaprop + safener)	0.045	PI	0	0	0	0
Triclopyr + clefoxydim + Agri-Dex (0.25%)	0.38 0.094	PI	0	0	0	100
Triclopyr + clefoxydim + Agri-Dex (0.25%)	0.38 0.067	PI	0	0	0	100
(Fenoxaprop + safener) + triclopyr	0.045 0.38	EPOST	20	0	60	66
(Fenoxaprop + safener) + triclopyr	0.045 0.38	PI	0	0	0	100
LSD (0.05)			NS	NS	NS	13

continued

Table 81. Section 2.

Herbicide	Rate (lb/A)	Application timing	Barnyardgrass (ECHCG) control			Rice injury		
			5/20	6/8	7/15	5/20	6/8	7/15
			----- (%) -----					
Untreated check			0	0	0	0	0	0
Clefoxydim + Agri-Dex (0.25%)	0.067	EPOST	48	96	93	0	0	0
Clefoxydim + Agri-Dex (0.25%)	0.094	PI	20	0	13	0	0	0
(Fenoxaprop + safener)	0.045	EPOST	20	100	92	0	0	0
(Fenoxaprop + safener)	0.045	PI	25	0	28	0	0	0
Triclopyr + clefoxydim + Agri-Dex (0.25%)	0.38 0.094	PI	35	0	8	0	0	0
Triclopyr + clefoxydim + Agri-Dex (0.25%)	0.38 0.067	PI	33	0	0	0	0	0
(Fenoxaprop + safener) + triclopyr	0.045 0.38	EPOST	24	96	79	0	0	0
(Fenoxaprop + safener) + triclopyr	0.045 0.38	PI	23	0	0	0	0	0
LSD (0.05)			53	4	18	NS	NS	NS

Table 82. Early postemergence herbicides for control of grasses and broadleaves, Rohwer, 1999.

TEST INFORMATION

Location	Rohwer	Planting date	April 22, 1999
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	5 ft by 17 ft	Crop / Variety	Rice / Lemont
Row width / Number of rows per plot	6 in. / 9 rows	Dates of flushing	April 26, May 3, 11, and 27, 1999
Soil type	clay loam (8% sand, 49% silt, 43% clay)	Date of flooding	June 10, 1999
% OM / pH	3.5 / 6.7		

Comments: EPOST = early postemergence; and PREFL = pre flood.

Application type	EPOST	PREFL
Date applied	5/17/99	6/7/99
Time	8:00 am	11:00 am
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	60 / 50	84 / 80
Relative humidity (%)	60	90
Wind (mph)	6	4
Weather	partly cloudy	N/A
Soil moisture	N/A	N/A
Crop stage/Height	2-3 lf / 3"	4-5 lf / 6"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Flat fan / 8002	Flat fan / 8002
Boom ht / # Noz / Spacing (in.)	22 / 3 / 19	22 / 3 / 19
Gpa / Psi	15 / 22	15 / 24
Weed species	----- (# leaves) -----	
ECHCG	2-3 lf	4-5 lf
SEBEX	1-3 lf	4-6 lf
IPOLA	1-3 lf	1-3 lf

Conclusions: Both injury and weed control were generally higher in reps 1 and 4 than in 2 and 3. Some individual plots exhibited as high as 30% injury 8 days following the EPOST application but, when averaged over all reps, injury from herbicide treatments did not differ from untreated plots. At 21 DAT, propanil (Stam) alone at 4.0 lb ai/A and propanil + triclopyr (Grandstand) applied EPOST provided poor control of barnyardgrass. Triclopyr in combination with propanil + molinate (Arrosolo), propanil + pendimethalin (Prowl), propanil + quinclorac (Facet), (propanil + molinate) + quinclorac, propanil + thiobencarb (Bolero), and propanil + molinate + thiobencarb provided greater than 80% control of barnyardgrass 21 DAT. Bispyribac-sodium (Regiment) applied EPOST provided 82% control of barnyardgrass 21 DAT. The extremely heavy population of barnyardgrass broke through all treatments, and none were commercially acceptable by late season.

Table 82.

Herbicide	Application		Weed control								
			Barnyardgrass			Hemp sesbania		Pitted		Rice	
			(ECHCG)			(SEBEX)		(IPOLA)		injury	
Rate	timing	5/25	6/7	8/24	5/25	8/24	5/25	6/7	5/25	6/7	
(lb/A)		----- (%) -----									
Untreated check			0	0	0	0	50	0	0	0	0
Triclopyr +	0.19										
propanil	4.0	EPOST	41	25	8	100	75	42	78	1	0
Triclopyr +	0.19										
(propanil +molinate)	4.5	EPOST	90	87	28	100	62	100	98	2	0
Triclopyr +	0.19										
propanil +	4.0										
pendimethalin	1.0	EPOST	82	89	45	100	32	100	86	12	9
Triclopyr +	0.19										
(propanil +molinate)	4.5										
+ pendimethalin	1.0	EPOST	94	96	45	100	35	100	88	18	6
Triclopyr +	0.19										
propanil +	4.0										
quinclorac	0.25	EPOST	65	89	38	100	98	94	100	6	6
Triclopyr +	0.19										
(propanil + molinate)	4.5										
+ quinclorac	0.25	EPOST	89	92	60	100	98	100	100	1	4
Triclopyr +	0.19										
propanil +	4.0										
thiobencarb	3.0	EPOST	92	95	36	100	48	100	96	20	4
Triclopyr +	0.19										
(propanil + molinate)	4.5										
+ thiobencarb	3.0	EPOST	98	96	70	100	20	100	100	11	6
Triclopyr +	0.19										
propanil +	4.0										
halosulfuron	0.032	EPOST	58	60	22	100	72	99	75	15	8
Propanil +	4.0										
pendimethalin	1.0	EPOST	91	86	29	100	48	100	30	14	2

continued

Table 82. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Barnyardgrass (ECHCG)			Hemp sesbania (SEBEX)		Pitted morningglory (IPOLA)		Rice injury	
			5/25	6/7	8/24	5/25	8/24	5/25	6/7	5/25	6/7
			----- (%) -----								
Propanil <i>fb</i>	4.0	EPOST									
triclopyr +	0.25										
bispyribac-sodium	0.02										
+ Kinetic (0.25%)		PREFL	40	28	40	100	100	51	71	4	0
Propanil <i>fb</i>	4.0	EPOST									
triclopyr +	0.25										
carfentrazone +	0.01										
AG-98 (0.25%)		PREFL	60	40	10	100	100	100	100	10	4
Propanil <i>fb</i>	4.0	EPOST									
triclopyr +	0.25										
acifluorfen +	0.12										
AG-98 (0.25%)		PREFL	45	40	18	100	100	100	58	9	0
Propanil <i>fb</i>	4.0	EPOST									
triclopyr +	0.25										
propanil	1.0	PREFL	56	52	20	98	98	75	98	10	2
Propanil <i>fb</i>	4.0	EPOST									
triclopyr	0.25	PREFL	49	45	18	100	88	72	90	8	2
(Fenoxaprop +											
safener) <i>fb</i>	0.133	EPOST									
triclopyr +	0.25										
(fenoxaprop +											
safener)	0.133	PREFL	80	82	36	88	72	38	0	4	0
Propanil <i>fb</i>	4.0	EPOST									
triclopyr +	0.25										
(fenoxaprop +											
safener)	0.133	PREFL	70	40	6	100	100	82	75	4	0
LSD (0.05)			30	27	33	8	45	33	40	NS	NS

Table 83. Tankmixes for broadleaf weed control in rice, Rohwer, 1999.**TEST INFORMATION**

Location	Rohwer	Planting date	April 24, 1999
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	5 ft by 17 ft	Crop / Variety	Rice / Lemont
Row width / Number of rows per plot	6 in. / 8 rows	Dates of flushing	April 26, May 5, 11, and 27, 1999
Soil type	silty clay (8% sand, 49% silt, 43% clay)	Date of flooding	June 10, 1999
% OM / pH	3.5 / 6.7		

Comments: EPOST = early postemergence; MPOST = mid-postemergence; and PREFL = pre flood.

Application type	EPOST	MPOST	PREFL
Date applied	5/15/99	5/26/99	6/7/99
Time	7:30 am	8:30 am	10:00 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	79 / 78	70 / 71	80 / 79
Relative humidity (%)	60	90	90
Wind (mph)	6	4	2
Weather	partly cloudy	cloudy	N/A
Soil moisture	dry-wet	dry	dry
Crop stage/Height	2-3 lf / 4"	3-4 lf / 6"	5 lf / 9"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Flat fan / 8002	Flat fan / 8002	Flat fan / 8002
Boom ht / # Noz / Spacing (in.)	22 / 3 / 19	22 / 3 / 19	22 / 3 / 19
Gpa / Psi	15 / 22	15 / 23	15 / 24
Weed species	-----	(# leaves) -----	-----
ECHCG	2-3 lf	2-4 lf	2-5 lf
SEBEX	2-3 lf	2-4 lf	2-5 lf
IPOLA	2 lf	2-4 lf	2-6 lf

Conclusions: All treatments were safe to rice except triclopyr (Grandstand) + propanil + molinate (Arrosolo) applied EPOST, which caused 16% injury at 10 DAT. The rice recovered well with no visible injury later in the season. The triclopyr + (propanil + molinate) EPOST treatment also provided 98% control of barnyardgrass 10 DAT. All other treatments failed to provide acceptable barnyardgrass control. All EPOST treatments provided excellent control of hemp sesbania at 10 DAT. However, by 23 DAT control had dropped to 62% with propanil alone applied EPOST. Propanil alone at 4.0 lb ai/A and triclopyr alone at 0.19 lb ai/A provided 88% and 40% control, respectively, at 10 DAT, and 38% and 58% control, respectively, at 23 DAT for palmleaf morningglory control. At 23 DAT the triclopyr + (propanil + molinate) tankmix continued to provide excellent barnyardgrass control. However, by late season, even this treatment was providing less than 70% barnyardgrass control. By late season, the EPOST treatments had begun to lose effectiveness. MPOST and EPOST treatments continued to provide better control of hemp sesbania.

Table 83.

Herbicide	Rate (lb/A)	Application timing	Weed control								
			Barnyardgrass (ECHCG)			Hemp sesbania (SEBEX)			Pitted morningglory (IPOLA)		Rice injury
			5/25	6/7	8/24	5/25	6/7	8/24	5/25	6/7	5/25
			----- (%) -----								
Untreated check			0	0	0	0	0	0	0	0	0
Triclopyr + AG-98 (0.25%)	0.25 0.19	MPOST	0	18	8	0	98	88	0	100	0
Triclopyr + propanil	0.19 4.0	EPOST	64	28	20	100	95	70	100	92	25
Triclopyr + (propanil + molinate)	0.19 6.0	EPOST	98	96	66	100	98	20	100	100	16
Triclopyr + propanil	0.25 4.0	MPOST	0	78	46	0	100	68	0	100	0
Triclopyr + propanil <i>fb</i>	0.19 4.0	EPOST									
Triclopyr + propanil	0.25 1.0	PREFL	58	34	21	100	98	91	100	100	6
Triclopyr + propanil <i>fb</i>	0.25 4.0	MPOST									
Triclopyr + propanil	0.25 1.0	PREFL	0	68	28	0	100	100	0	100	0
Triclopyr + AG-98 (0.25%)	0.25	PREFL	0	0	8	0	0	100	0	0	0
Triclopyr + AG-98 (0.25%)	0.38	PREFL	0	0	5	0	0	98	0	0	0
Triclopyr + propanil	0.25 1.0	PREFL	0	0	8	0	0	100	0	0	0
Triclopyr + propanil	0.38 1.0	PREFL	0	0	8	0	0	100	0	0	0
Triclopyr + (propanil + molinate)	0.25 1.5	PREFL	0	0	10	0	0	100	0	0	0
Propanil	4.0	EPOST	79	52	12	100	62	65	100	38	6
Triclopyr + AG-98 (0.25%)	0.19	EPOST	5	6	0	94	90	100	94	58	0
LSD (0.05)			17	26	28	1	20	28	19	23	NS

Table 84. Rice flatsedge control, Lonoke, 1999.**TEST INFORMATION**

Location	Lonoke	Planting date	May 11, 1999
Experimental Design / replications	RCB / 4	Harvest date	September 16, 1999
Plot size	10 ft by 20 ft	Crop / Variety	Rice / Wells
Row width / Number of rows per plot	7.5 in. / 14 rows	Dates of flushing	May 13, 14, 21, 22, and June 8, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 18, 1999
% OM / pH	1.3 / 5.1		

Comments: PRE = preemergence; and PREFL = pre flood.

Application type	PRE	PREFL
Date applied	5/11/99	6/10/99
Time	4:25 pm	9:30 am
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	80 / 72	82 / 80
Relative humidity (%)	62	73
Wind (mph)	4	5
Weather	partly cloudy	clear
Soil moisture	dry	moist
Crop stage/Height	N/A	1 tiller / 11"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	16 / 6 / 20	21 / 6 / 20
Gpa / Psi	10 / 21	10 / 17
Weed species	----- (# leaves/height) -----	
CYPIR (52/sq ft)	N/A	4-6 lf / 3-4"

Conclusions: The entire study was treated with clomazone (Command) for grass control and to "create" a rice flatsedge infestation, which was dense and uniform. The two primary treatments that did not control flatsedge were triclopyr (Grandstand) and carfentrazone (Aim) applied alone. The rice emerged to an excellent stand and grew rapidly. By the end of the season, the rice flatsedge was non-competitive even in the checks.

Table 84. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control				
			Rice flatsedge (CYPIR)			Broadleaf signalgrass (BRAPP)	Barnyardgrass (ECHCG)
			6/15	7/12	8/2	8/2	8/2
			----- (%) -----				
Clomazone	0.4	PRE	0	0	63	100	96
Clomazone <i>fb</i> propanil + Penetrator Plus (1 pt/A)	0.4 4.0	PRE					
Clomazone <i>fb</i> (acifluorfen + bentazon) + AG-98 (0.25%)	0.4 0.75	PREFL	68	98	100	100	100
Clomazone <i>fb</i> propanil + Penetrator Plus (1 pt/A) + (acifluorfen + bentazon)	0.4 4.0 0.75	PRE PREFL	95	100	100	100	100
Clomazone <i>fb</i> bensulfuron	0.4 0.019	PRE PREFL	13	99	100	100	100
Clomazone <i>fb</i> bensulfuron	0.4 0.037	PRE PREFL	23	100	100	100	100
Clomazone <i>fb</i> propanil + bensulfuron + Penetrator Plus (1 pt/A)	0.4 4.0 0.037	PRE PREFL	65	100	100	100	100
Clomazone <i>fb</i> halosulfuron + AG-98 (0.25%)	0.4 0.031	PRE PREFL	20	100	100	100	100
Clomazone <i>fb</i> halosulfuron + AG-98 (0.25%)	0.4 0.047	PRE PREFL	18	100	100	100	100
Clomazone <i>fb</i> propanil + halosulfuron + Penetrator Plus (1 pt/A)	0.4 4.0 0.047	PRE PREFL	75	100	100	100	100
Clomazone <i>fb</i> propanil + triclopyr + Penetrator Plus (1 pt/A)	0.4 4.0 0.25	PRE PREFL	81	100	100	100	100
Clomazone <i>fb</i> triclopyr + AG-98 (0.25%)	0.4 0.25	PRE PREFL	15	90	90	98	100

continued

Table 84. Section 1. Continued.

Herbicide	Rate (lb/A)	Application timing	Weed control				
			Rice flatsedge (CYPIR)			Broadleaf signalgrass (BRAPP)	Barnyardgrass (ECHCG)
			6/15	7/12	8/2	8/2	8/2
----- (%) -----							
Clomazone <i>fb</i> triclopyr + AG-98 (0.25%)	0.4 0.375	PRE PREFL	20	99	96	96	100
Clomazone <i>fb</i> propanil + quinclorac + Penetrator Plus (1 pt/A)	0.4 4.0 0.125	PRE PREFL	88	100	100	100	100
Clomazone <i>fb</i> quinclorac + Agri-Dex (1%)	0.4 0.25	PRE PREFL	15	91	86	100	100
Clomazone <i>fb</i> carfentrazone + AG-98 (0.25%)	0.4 0.02	PRE PREFL	19	78	64	100	96
Clomazone <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	0.4 0.019	PRE PREFL	8	96	98	100	100
Clomazone <i>fb</i> propanil + carfentrazone + Penetrator Plus (1 pt/A)	0.4 4.0 0.02	PRE PREFL	80	100	100	100	100
LSD (0.05)			8	3	17	3	3

continued

Table 84. Section 2.

Herbicide	Rate (lb/A)	Application timing	Hemp sesbania (SEBEX) control	Effect on rice		
			8/2	Injury		Yield
			8/2	6/15	7/12	9/16
----- (%) -----						
(lb/A)						
Clomazone	0.4	PRE	93	0	0	7965
Clomazone <i>fb</i> propanil + Penetrator Plus (1 pt/A)	0.4 4.0	PRE PREFL	100	10	0	8190

continued

Table 84. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Hemp sesbania	Effect on rice		
			(SEBEX) control 8/2	Injury		Yield
			-----	(%) -----		(lb/A)
Clomazone <i>fb</i> (acifluorfen + bentazon) + AG-98 (0.25%)	0.4 0.75	PRE PREFL	100	18	0	6885
Clomazone <i>fb</i> propanil + Penetrator Plus (1 pt/A) + (acifluorfen + bentazon)	0.4 4.0 0.75	PRE PREFL	100	16	0	8370
Clomazone <i>fb</i> bensulfuron	0.4 0.019	PRE PREFL	100	0	0	8505
Clomazone <i>fb</i> bensulfuron	0.4 0.037	PRE PREFL	100	0	0	7650
Clomazone <i>fb</i> propanil + bensulfuron + Penetrator Plus (1 pt/A)	0.4 4.0 0.037	PRE PREFL	100	8	0	8775
Clomazone <i>fb</i> halosulfuron + AG-98 (0.25%)	0.4 0.031	PRE PREFL	100	0	0	8550
Clomazone <i>fb</i> halosulfuron + AG-98 (0.25%)	0.4 0.047	PRE PREFL	100	0	0	7245
Clomazone <i>fb</i> propanil + halosulfuron + Penetrator Plus (1 pt/A)	0.4 4.0 0.047	PRE PREFL	100	10	0	8370
Clomazone <i>fb</i> propanil + triclopyr + Penetrator Plus (1 pt/A)	0.4 4.0 0.25	PRE PREFL	100	15	0	8370
Clomazone <i>fb</i> triclopyr + AG-98 (0.25%)	0.4 0.25	PRE PREFL	100	0	0	7785
Clomazone <i>fb</i> triclopyr + AG-98 (0.25%)	0.4 0.375	PRE PREFL	100	0	0	8505

continued

Table 84. Section 2. Continued.

Herbicide	Rate (lb/A)	Application timing	Hemp sesbania	Effect on rice		Yield 9/16 (lb/A)
			(SEBEX) control 8/2	Injury		
				6/15	7/12	
			-----	(%)	-----	
Clomazone <i>fb</i> propanil + quinclorac + Penetrator Plus (1 pt/A)	0.4 4.0 0.125	PRE PREFL	100	13	0	7560
Clomazone <i>fb</i> quinclorac + Agri-Dex (1%)	0.4 0.25	PRE PREFL	100	0	0	8640
Clomazone <i>fb</i> carfentrazone + AG-98 (0.25%)	0.4 0.02	PRE PREFL	100	3	0	6885
Clomazone <i>fb</i> bispyribac-sodium + Kinetic (0.125%)	0.4 0.019	PRE PREFL	100	0	0	8325
Clomazone <i>fb</i> propanil + carfentrazone + Penetrator Plus (1 pt/A)	0.4 4.0 0.02	PRE PREFL	100	10	0	8550
LSD (0.05)			3	3	0	1350

Table 85. Preflood nutsedge control, Lodge Corner, 1999.

TEST INFORMATION

Location	Lodge Corner	Planting date	May 3, 1999
Experimental Design / replications	RCB / 4	Harvest date	N/A
Plot size	7 ft by 20 ft	Crop / Variety	Rice / Bengal
Row width / Number of rows per plot	7.5 in. / 9 rows	Dates of flushing	May 15, 1999
Soil type . Crowley silt loam (8% sand, 75% silt, 16% clay)		Date of flooding	June 8, 1999
% OM / pH	1.3 / 5.1		

Comments: PRE = preemergence; 2-3 LF = 2-3 lf rice; and PREFL = preflood.

Application type	PRE	2-3 LF	PREFL
Date applied	5/3/99	5/24/99	6/3/99
Time	3:50 pm	4:00 pm	2:35 pm
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	81 / 70	85 / 79	93 / 84
Relative humidity (%)	38	32	59
Wind (mph)	6.5	2.5	3
Weather	partly cloudy	clear	partly cloudy
Soil moisture	moist	damp	moist
Crop stage/Height	N/A	3-4 lf / 7"	4 lf / 8"
Sprayer type/mph	BkPkCO ₂ / 3	BkPkCO ₂ / 3	BkPkCO ₂ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	15 / 4 / 20	18 / 4 / 20	18 / 4 / 20
Gpa / Psi	10 / 21	10 / 19	10 / 15
Weed species	----- (# leaves/height) -----		
CYPES	N/A	4-6 lf / 6"	7 lf / 12"
SEBEX	N/A	1 lf / 0.5"	N/A
AESVI	N/A	N/A	4 lf / 3.5"

Conclusions: This study was conducted at Lodge Corner in a heavy infestation of yellow nutsedge. Most treatments provided good overall weed control, but halosulfuron (Permit) alone is better than bensulfuron (Londax) alone on this species.

Table 85. Section 1.

Herbicide	Application		Weed control						
			Yellow nutsedge (CYPES)				Hemp sesbania (SEBEX)		
			5/24	6/11	6/25	8/3	5/24	6/11	6/25
	Rate (lb/A)	timing	----- (%) -----						
Untreated check			0	0	0	13	0	0	0
Propanil <i>fb</i>	4.0	2-3 LF							
propanil	4.0	PREFL	0	61	76	83	0	83	95
Propanil <i>fb</i>	4.0	2-3 LF							
(propanil + molinate)	6.0	PREFL	0	54	78	88	0	74	100
Propanil <i>fb</i>	4.0	2-3 LF							
propanil +	4.0								
bensulfuron	0.0281	PREFL	0	61	83	95	0	91	95
Propanil <i>fb</i>	4.0	2-3 LF							
propanil +	4.0								
halosulfuron	0.032	PREFL	0	75	99	100	0	85	100
Propanil <i>fb</i>	4.0	2-3 LF							
[bensulfuron + propanil									
(Duet)] +	4.031								
Penetrator Plus (1 pt/A)		PREFL	0	58	54	68	0	100	95
Clomazone <i>fb</i>	0.4	PRE							
bensulfuron +	0.0375								
propanil	3.0	PREFL	35	55	56	95	65	99	100
Clomazone <i>fb</i>	0.4	PRE							
(bensulfuron +									
propanil) +	3.023								
Penetrator Plus (1 pt/A)		PREFL	28	45	53	81	61	98	100
Clomazone <i>fb</i>	0.4	PRE							
propanil +	3.0								
bensulfuron +	0.023								
Penetrator Plus (1 pt/A)		PREFL	23	43	23	56	81	94	95
LSD (0.05)			19	21	31	35	28	15	9

continued

Table 85. Section 2.

Herbicide	Rate (lb/A)	Application timing	Weed control			Rice injury		
			Northern jointvetch (AESVI)	Annual grasses	Barnyardgrass (ECHCG)	5/24	6/11	6/25
			6/25	6/25	8/3	----- (%) -----		
Untreated check			0	0	13	0	0	0
Propanil <i>fb</i>	4.0	2-3 LF						
propanil	4.0	PREFL	95	90	100	0	11	0
Propanil <i>fb</i>	4.0	2-3 LF						
(propanil + molinate)	6.0	PREFL	100	80	100	0	11	0
Propanil <i>fb</i>	4.0	2-3 LF						
propanil +	4.0							
bensulfuron	0.0281	PREFL	95	94	100	0	8	0
Propanil <i>fb</i>	4.0	2-3 LF						
propanil +	4.0							
halosulfuron	0.032	PREFL	100	95	100	0	10	0
Propanil <i>fb</i>	4.0	2-3 LF						
[bensulfuron + propanil								
(Duet)] +	4.031							
Penetrator Plus (1 pt/A)		PREFL	95	83	100	0	15	0
Clomazone <i>fb</i>	0.4	PRE						
bensulfuron +	0.0375							
propanil	3.0	PREFL	100	96	100	4	19	0
Clomazone <i>fb</i>	0.4	PRE						
(bensulfuron +								
propanil) +	3.023							
Penetrator Plus (1 pt/A)		PREFL	100	73	100	9	15	0
Clomazone <i>fb</i>	0.4	PRE						
propanil +	3.0							
bensulfuron +	0.023							
Penetrator Plus (1 pt/A)		PREFL	95	81	100	6	14	0
LSD (0.05)			9	16	12	3	10	0

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

Common name	Trade name (formulation ^y)	Company	Chemical name
acifluorfen	Blazer (2 SL)	BASF	5-[2-chloro-4-(trifluoromethyl)phenoxy]-2-nitrobenzoic acid
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
AG-98 (surfactant)	–	Rohm & Haas	–
Agri-Dex (crop oil)	Agri-Dex	Helena	–
bensulfuron	Londax (60 DF)	DuPont	2-[[[[[4,6-dimethoxy-2-pyrimidinyl]amino]carbonyl]amino]sulfonyl]methyl]benzoic acid
(bensulfuron + propanil)	Duet (4 F)	Riceco	(see individual components)
(bensulfuron + propanil + molinate)	Super Duet (4 F)	Riceco	(see individual components)
bentazon	Basagr ⁿ (4 SL)	BASF	3-(1-methylethyl)-(1 <i>H</i>)-2,1,3-benzothiadiazin-4(3 <i>H</i>)-one 2,2-dioxide
bispyribac-sodium (formerly V-10029)	Regiment (80 WP)	Valent	sodium 2,6-bis[[4,6-dimethoxy-pyrimidin-2-yl]oxy]benzoate
carfentrazone	Aim (40 DF)	FMC	<i>N</i> -[2,4-dichloro-5-(4-(difluoromethyl)-4,5-dihydro-3-methyl-5-oxo-1 <i>H</i> -1,2,4-triazol)-1-ylphenyl]-methanesulfonamide
clefoxydim (BAS 625H)	Aura (1.67 EC)	BASF	2-[1-(2-(4-chlorophenoxy)propoxyimino)butyl]-3-oxo-5-thione-3-ylcyclohex-1-enol
CGA-279233	– (1.67 F)	Novartis	–
CGA-279233 A10007A	– (75 WG)	Novartis	–
CGA-279233 A10007C	– (75 WG)	Novartis	–
clomazone	Command (3 ME)	FMC	2-[(2-chlorophenyl)methyl]-4,4-dimethyl-3-isoxazolidinone
Crop Oil Plus (adjuvant)	Crop Oil Plus	Wilfarm	
cyhalofop (formerly DE-537)	Clincher (2.38 EC)	Dow AgroSciences	(<i>R</i>)-2-[4-(4-cyano-2-fluorophenoxy)phenoxy]propanoic acid
Eth-N-Gard (adjuvant)	Eth-N-Gard	Wilfarm	
fenoxaprop	Whip (1EC); Whip 360 (0.57 EC)	AgrEvo	(+)-2-[4-[(6-chloro-2-benzoxazolyl)oxy]phenoxy]propanoic acid
fenoxaprop + safener	Ricestar (1.2 EC)	AgrEvo	(see fenoxaprop)

continued

Appendix Table 1. Continued.

Common name	Trade name (formulation ^y)	Company	Chemical name
glufosinate	Liberty (1.67 EC)	AgrEvo	2-amino-4-(hydroxymethylphosphinyl)butanoic acid
glyphosate	Roundup Ultra (4 SL)	Monsanto	<i>N</i> -(phosphonomethyl)glycine
halosulfuron	Permit (75 DF)	Monsanto	3-chloro-5-[[[(4,6-dimethoxy-2-pyrimidinyl)amino]carbonyl]amino]-sulfonyl]-1-methyl-1H-pyrazole-4-carboxylic acid
Hasten (adjuvant)	Hasten	Wilfarm	
Hi-Per-Oil (adjuvant)	Hi-Per-Oil	Wilfarm	
imazamox	Raptor	Cyanamid	2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-5-(methoxymethyl)-3-pyridinecarboxylic acid
imazapic	Cadre	Cyanamid	(±)-2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-5-methyl-3-pyridinecarboxylic acid
imazaquin	Scepter	Cyanamid	2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-quinolinecarboxylic acid
imazethapyr	Pursuit (2 EC, 70 WG)	Cyanamid	2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-5-ethyl-3-pyridinecarboxylic acid
Kinetic (surfactant)	Kinetic	Helena	–
molinatate	Ordram (15 G)	Zeneca	S-ethyl hexahydro-1H-azepine-1-carbothioate
nicosulfuron	Accent	DuPont	2-[[[(4,6-dimethoxy-2-pyrimidinyl)amino]carbonyl]amino]sulfonyl]- <i>N,N</i> -dimethyl-3-pyridinecarboxamide
paraquat	Gramoxone Extra	Zeneca	1,1'-dimethyl-4,4'-bipyridinium ion
pendimethalin	Prowl (3.3 EC); Pentagon (60 DF)	Cyanamid	<i>N</i> -(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine
Penetrator Plus (crop oil / surfactant)	Penetrator Plus	Helena	–
Peptoil (adjuvant)	Peptoil	Wilfarm	
Placement (adjuvant)	Placement	Wilfarm	
Pro-Pak (adjuvant)	Pro-Pak	Wilfarm	
propanil	Stam 4M (4 EC); Stam 80DF; Super Wham (4 EC)	Rohm & Haas; Cedar	<i>N</i> -(3,4-dichlorophenyl)propanamide
(propanil + molinate)	Arrosolo (3 + 3 EC)	Zeneca	(see individual components)
quinclorac	Facet (75 DF; 1.5 G)	BASF	3,7-dichloro-8-quinolinecarboxylic acid
thiobencarb	Bolero (8 EC; 10 G)	Valent	S-[(4-chlorophenyl)methyl]diethylcarbamoithioate
TRA0255 (adjuvant)	–		
triclopyr	Grandstand (3 SL)	Dow AgroSciences	[(3,5,6-trichloro-pyridinyl)oxy]acetic acid
WDA-191 (adjuvant)	WDA-191	Wilfarm	
WDA-194 (adjuvant)	WDA-194	Wilfarm	

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

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

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

Common name	Bayer code ^z	Scientific name
Amazon sprangletop	LEFPA	<i>Leptochloa panicoides</i> (Presl) Hitchc.
Annual sedge	CYPCP	<i>Cyperus compressus</i> L.
Barnyardgrass	ECHCG	<i>Echinochloa crus-galli</i> (L.) Beauv.
Bearded sprangletop	LEFFA	<i>Leptochloa fascicularis</i> (Lam.) Gray
Broadleaf signalgrass	BRAPP	<i>Brachiaria platyphylla</i> (Griseb.) Nash.
Carpetweed	MOLVE	<i>Mollugo verticillata</i> L.
Common purslane	POROL	<i>Portulaca oleracea</i> L.
Ducksalad	HELTI	<i>Heteranthera limosa</i> (Sw.) Willd.
Eclipta	ECLAL	<i>Eclipta prostrata</i> L.
Entireleaf morningglory	IPOGH	<i>Ipomoea hederacea</i> var. <i>integriuscula</i>
Falsepimpernel	LIDAE	<i>Lindernia anagallidea</i> (Michx.) Pennell
Hemp sesbania	SEBEX	<i>Sesbania exaltata</i> (Raf.) Rydb.
Ivyleaf morningglory	IPOHE	<i>Ipomoea hederacea</i> (L.) Jacq.
Morningglory species	IPOSS	<i>Ipomoea</i> spp.
Northern jointvetch	AESVI	<i>Aeschynomene virginica</i> (L.) B.S.P.
Palmleaf morningglory	IPOWR	<i>Ipomoea wrightii</i> Gray
Pink ammannia	AMMTE	<i>Ammannia latifolia</i> L.
Pitted morningglory	IPOLA)	<i>Ipomoea lacunosa</i> L.
Purple ammannia	AMMCO	<i>Ammannia coccinea</i> Rottb.
Red rice	ORYSA	<i>Oryza sativa</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.
Water hyssop	BAOIN	<i>Bacopa innominata</i> (Gomez Musa) Alain
Yellow nutsedge	CYPES	<i>Cyperus esculentus</i> L.

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

Appendix Table 3. Climatological data, Lonoke Extension Center, Lonoke, 1999.

Day	May			June			July			August		
	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	74	48		88	64	0.97	87	74		100		
2	76	46		84			90	75		97		
3	80	55		89			91	74		94		
4	80	58	0.55	90			90	72		97		
5	79	64	1.30	90	68		91	71		94	70	
6	76	51		90	68		92	71	0.40	96	70	
7	77	45		89	67		92	70	0.12	100	70	
8	85	46		90	68		92	73		97	74	
9	85	50		88	66		90	75		94	77	
10	78	57		90	67		88	71	1.01	96	73	
11	77	63		87	67		77	65	0.32	104	74	
12	79	58		85	69		80	61		101	75	
13	76	53		97	69	0.13	83	59		105	67	
14	76	46		82	69	T ^z	85	64		94	60	
15	83	57		80	64		89	69		88	57	
16	85	65		80	57		89	69		95	59	
17	83	70	0.10	77	62		89	71		101	64	
18	79	61	0.88	78	58		91	70		102	66	
19	77	50		83	56		93	71		102	66	
20	80	53		85	66		93	72		98	68	
21	80	58	0.45	87	62		94	72		89	59	
22	86	64		88	71		95	72		95	65	
23	84	65	0.12	85	69	0.20	97	72		92	71	
24	80	55		88	69	0.54	97	74		94	62	0.67
25	78	57		87	69	0.06	98		1.45	99	62	
26	76	62		86	72	0.52	98		T	94	65	
27	73	48		90	72		95			96	65	T
28	80	54		88	78		96			95	68	
29	85	54		85	69	0.45	98			96	66	
30	83	64	T	82	66	0.67	96			95	72	
31	75	68	0.13				95			93	69	

^z T = trace.

Appendix Table 4. Climatological data, Pine Tree Branch Experiment Station, Colt, 1999.

Day	May			June			July			August		
	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	71	46		80	68	0.03	83	71		95	77	
2	76	48		87	67	0.06	87	76		96	73	
3	79	57		87	67	0.14	90	74		91	67	
4	81	63		91	74	T ^z	92	75		92	65	
5	76	63	0.40	90	73		91	74		91	68	
6	82	58	0.34	92	73		93	74		92	70	
7	73	52		92	69		93	72		93	73	
8	76	51		93	72		91	71		96	77	
9	82	54		93	72		92			89	72	0.33
10	86	63		93	72		92	75		89		
11	85	65		93	76		86	69	0.27	93	72	
12	78	60		90	70		77	64	0.09	95	77	
13	79	57		83	72		81	61		96		
14	77	54		88	70		82	60		95	64	0.10
15	76	58		83	64		86	64		83	58	
16	85	62		81	59		90	72		85		
17	88	71		78	60		90	70		92		
18	87	62	0.92	77	54		89	72		94	67	
19	75	54		81	59		92	76		96	69	
20	78	57		85	65		93	75		94	63	
21	83	65		86	67		92	74		87	63	
22	81	68	0.06	88	67		93	75		85	62	
23	85	67	0.19	89	73		93	76		91	65	
24	83	57		80	72	0.68	95	77		81	68	1.54
25	80	57		86	71	0.14	97	76		89		
26	77	61	0.05	85	73	0.03	95	76	0.04	86	65	
27	78	52		82	72	1.22	96	77		87	65	
28	80	58		89	74		96	72		97	68	
29	83	62		87	73	0.01	96	74		91	66	
30	87	67		81	69	0.16	99	78		91	67	
31	85	68					96	78		88	57	

^z T = trace.

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

Day	May			June			July			August		
	Temp.		Rain-fall	Temp.		Rain-fall	Temp.		Rain-fall	Temp.		Rain-fall
	Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.	
(°F)	(°F)	(in.)	(°F)	(°F)	(in.)	(°F)	(°F)	(in.)	(°F)	(°F)	(in.)	
1	73	50		81	68	0.02	87	71		96	75	
2	78	52		89	65	0.33	91	76		97	77	
3	85	60	0.02	92	72		92	74		94	69	
4	83	62		94	73		93		0.16	93	68	
5	78	67	0.45	97	74		93	73		94	72	
6	85	57	0.32	95	74		93	73		92	71	
7	78	52		96	70		94	75	0.04	94	71	
8	80	54		94	70		94	73	0.62	98	72	
9	88	53		94	71		92	74		97	77	
10	90	63		94	68		91	74		93	72	
11	87	66		95	69		91	73	0.70	92	75	
12	75	58		95	69	0.05	80	66		100	77	
13	86	60		84	70	0.07	82	64		98	75	
14	82	52		93	69	1.32	85	68		99	71	
15	86	59		85	67	0.03	86	71		86	63	
16	90	63		83	66		91	70		86	60	
17	92	70		84	66		91	71		93	60	
18	90	63	0.49	80	58		91	72		95	63	
19	79	54		81	55		92	74		98	69	
20	82	60		86	55		92	74		101	69	
21	82	67		88	55		93	73		90	63	
22	90	66		87	68		93	72		89	65	
23	78	65	0.22	91	75		93	74		94	65	
24	87	63		86	73	0.38	95	74		94	73	0.30
25	84	61		90	71	0.12	97	76		91	70	0.10
26	89	66		83	72	0.62	97	77		91	66	
27	83	60		86	72	0.87	96	78		94	73	
28	84	62		91	72		97	78		92	70	
29	86	66		90	78	0.04	97	77		95	68	
30	91	66	0.06	90	70	0.15	98	76		96	68	
31	87	66	1.27				98	76		94	60	

Appendix Table 6. Climatological data, Rice Research and Extension Center, Stuttgart, 1999.

Day	May			June			July			August		
	Temp.		Rain- fall	Temp.		Rain- fall	Temp.		Rain- fall	Temp.		Rain- fall
	Max.	Min.		Max.	Min.		Max.	Min.		Max.	Min.	
(°F)	(°F)	(in.)	(°F)	(°F)	(in.)	(°F)	(°F)	(in.)	(°F)	(°F)	(in.)	
1	73	53		80	68		86	72		96	70	
2	75	55		88	65	0.56	90	75		97	76	
3	80	55		84	69	0.18	91	75		92	69	
4	82	62		91	75		93	75		92	68	
5	76	66	0.41	94	73		93	76		93	69	
6	82	56	1.31	93	74		94	76		94	72	
7	75	53	T ^z	94	72	0.08	95	76		95	73	
8	80	55		94	72		93	75		89	74	
9	86	61		94	72	0.32	94	76		96	74	
10	87	64		92	72		92	75		90	75	0.16
11	83	65		92	73		91	70	2.34	93	74	
12	77	62		91	72		76	66	0.22	100	75	
13	81	57		88	72	0.89	80	65		99	75	
14	77	55	0.37	88	71	0.06	84	65		97	68	
15	82	58		84	68		87	68		85	62	
16	88	69		82	63		90	72		86	62	
17	89	72		83	64		91	72		93	63	
18	88	68		82	61		93	74		96	64	
19	88	68		82	61		92	75		98	66	
20	86	68		87	71		93	75		99	68	
21	83	65		89	69		93	74		99	65	
22	81	62	0.05	90	68		92	75		90	64	
23	76	61	0.10	91	73	0.02	94	75		93	64	
24	81	60	T	91	73	0.14	95	70		91	68	0.18
25	83	62		91	71	0.55	98	77		90	67	
26	82	65	T	85	74	0.32	97	78		90	66	
27	79	58		85	69	0.15	96	79		93	70	
28	82	60		91	79		98	76		93	69	
29	85	63		89	77		99	76		97	70	
30	87	67		89	70	1.18	99	78		96	71	
31	84	62					99	77		94	59	

^z T = trace.