10-1-1999

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ARKANSAS AGRICULTURAL EXPERIMENT STATION
Division of Agriculture — University of Arkansas
October 1999 — Research Series 469

Cover design and technical editing by Karen Eskew

Arkansas Agricultural Experiment Station, University of Arkansas Division of Agriculture, Fayetteville. Milo J. Shult, Vice President for Agriculture and Director; Charles J. Scifres, Associate Vice President for Agriculture. 1M 10 / 99 PM65. The Arkansas Agricultural Experiment Station follows a nondiscriminatory policy in programs and employment.

ISSN:0099-5010 CODEN:AKAMA6

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SUMMARY

Weed control is economically important for production of rice, a major crop in Arkansas. These findings summarize efforts of the team of Arkansas scientists working on weed control strategies for rice during 1998. Various technologies were evaluated in field studies involving the major weed problems and rice production systems used in the state. Results from these studies will add to the arsenal of weed control options for producers. The preliminary results reported here generally warrant further testing for more advanced findings and for the labeling of new technologies and, finally, are the basis for updating safe, effective, and economical recommendations to Arkansas rice producers.

CONTENTS

ACKNOWLEDGMENTS

The authors acknowledge the Arkansas Rice Research and Promotion Board for financial support for some of these experiments. The following companies also provided financial support and chemicals used in the studies: AgrEvo, BASF, Cedar, Cyanamid, Dow AgroSciences, DuPont, FMC, Helena, Monsanto, Rhone-Poulenc, Rohm & Haas, Terra, UAP, Valent and Zeneca.

The assistance of the following individuals is gratefully acknowledged: Howard Black, Biological Technician, Dale Bumpers National Rice Research Center; Mike Dillon, Research Technician, Lonoke; Troy Dillon, Research Technician, Lonoke; Larry Earnest, Superintendent, Southeast Research and Extension Center, Rohwer Division; Bill Fox, Research Specialist, Rice Research and Extension Center, Stuttgart; John Robinson, Director, Rice Research and Extension Center, Stuttgart; Vaughn Skinner, Farm Manager, Arkansas Agricultural Research and Extension Center, Fayetteville; Randy Spurlock, Research Technician, Rohwer; Jennifer Wells, Graduate Assistant, Arkansas Agricultural Research and Extension Center, Fayetteville; Marilyn McClelland, Research Associate, Arkansas Agricultural Research and Extension Center, Fayetteville (editing and compilation); and Marci Milus and Joyce Booth, secretarial staff.

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INTRODUCTION

Herbicidal 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 three of the state's agronomic researchers responsible for weed control in rice. Ron Talbert, located at the Arkansas Agricultural Research and Extension Center, Fayetteville, conducts research at Fayetteville, at the Rice Research and Extension Center, Stuttgart, and at the Lonoke location of the University of Arkansas at Pine Bluff. 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.

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 1998 are presented in Appendix Table 3.

METHODS

Pertinent information specific to each field test precedes each data table. Included is information on general field conditions, field maintenance, 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./ft^2 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 prepackaged mixtures are listed in tables by their component herbicides in parentheses. All herbicide rates are expressed in pounds of active ingredient (lb / A) on a broadcast basis. Adjuvant rates are expressed as percent volume / volume.

Effects of the herbicide treatments were evaluated by weed control ratings, crop injury ratings, 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
BkPkCO_2, CO_2 backpack sprayer
Cot., cotyledon
DAT, days after treatment
DF, dry flowable
DPRE, delayed preemergence
EC, emulsifiable concentrate
EPOST, early postemergence
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, before 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. Evaluation of V-10029 programs for weed control in rice, Stuttgart, 1998.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft by 20 ft
Row width / Number of rows per plot ..... 6.5 in / 9 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
%OM / pH ..... 0.9 / 5.2

Planting date ..... May 11, 1998
Harvest date ..... September 28, 1998
Crop / Variety ..... Rice / Drew
Dates of Flushing ..... May 14, 21, and June 4, 1998
Date of Flooding ..... June 16, 1998

Comments: DPRE = delayed preemergence; EPOST = early postemergence; MPOST = mid-postemergence; PREFL = preflood; EPOFL = early post-flood; POFL = post-flood; and PI = panicle initiation. Weeds were planted in rows across rice rows.

Application type	DPRE	EPOST	MPOST	PREFL	EPOFL	POFL	PI
Date applied	5/18/98	5/28/98	6/3/98	6/9/98	6/18/98	6/23/98	6/30/98
Time	11:00 am	4:00 pm	12:00 pm	12:00 pm	9:00 am	11:30 am	2:30 pm
Incorporation equipment	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Air / Soil temperature (F)	92 / 82	80 / 80	89 / 100	85 / 82	82 / 81	98 / 90	91 / 80
Relative humidity (%)	45	90	65	75	65	45	65
Wind (mph)	4	1	5	5	3	5	6
Weather	clear	cloudy	partly cloudy	cloudy	mostly clear	clear	partly cloudy
Soil moisture	wet	wet	dry	moist	flooded	flooded	flooded
Crop stage / Height	N/A	2-3 lf / 6"	3-4 lf / 7"	4-6 lf / 9"	1-2 tiller / 12"	2-3 tiller / 14"	5-6 tiller / 20"
Sprayer type / mph	Bk Pk CO_2 / 3	Bk Pk CO_2 / 3	Hooded BM / 3	Hooded BM / 3	Bk Pk CO_2 / 3	Bk Pk CO_2 / 3	Bk Pk CO_2 / 3
Nozzle type / Size	Teejet / XR11002	Teejet / XR11002	Teejet / XR11002	Teejet / XR11002	Teejet / XR11002	Teejet / TJ11002	Teejet / TJ11002
Boom ht / # Noz / Spacing (in.)	15 / 3 / 18	15 / 3 / 18	15 / 3 / 18	15 / 3 / 18	15 / 3 / 18	15 / 3 / 18	15 / 3 / 18
Gpa / Psi	15 / 24	15 / 24	15 / 22	15 / 22	15 / 24	15 / 24	15 / 24
Weed species (density)	----------	----------	----------	(# leaves / height)	----------	----------	----------
R-ECHCG (15 / ft)	N/A	2-3 lf / 1-1.5"	3-4 lf / 3-4"	5-6 lf / 4-6"	2-3 till / 8-10"	3-4 till / 12"	2-3 till / 14-16"
ECHCG (12 / ft)	N/A	2-3 lf / 1"	3-4 lf / 3-4"	5-6 lf / 4-6"	2-3 till / 8-10"	3-4 till / 12"	2-3 till / 14-16"
SEBEX (9 / ft)	N/A	2-3 lf / 2-3"	3-4 lf / 3-5"	5-6 lf / 6"	6-9 lf / 14"	9-11 lf / 22"	11-13 lf / 31"

continued

	DPRE	EPOST	MPOST	PREFL	EPOFL	POFL	PI
AESVI(4/ft)	N/A	2-3lf/2-3"	3-4lf/2-4"	4-5lf/4"	7-10lf/6-9"	12-15lf/12-15"	14-16lf/17-19"
IAQTA(3/ft)	N/A	cot.-1lf/0.5-1.5"	2-3lf/1-2"	3lf/1-2"	N/A	N/A	N/A
IPOWR(5/ft)	N/A	cot.-1lf/1-1.5"	2-3lf/1-2"	5-8lf/3-4"	8-10lf/8-12"	10-12lf/12-14"	12-14lf/27"

Conclusions: V-10029 (bispyribac-sodium) alone or in a herbicide program is an excellent alternative for control of propanil-resistant and susceptible barnyardgrass. V-10029 also controlled hemp sesbania, northern jointvetch, and smallflower morningglory, but will need to be used in herbicide programs for controlling palmleaf morningglory. The ability of V-10029 to control barnyardgrass at later timings gives producers a salvage option for control if early-season failure occurs.

Table 1. Section 1.

			Weed control													
			Resistant barnyardgrass (R-ECHCG)				Barnyardgrass (ECHCG)					Hemp sesbania (SEBEX)				
Herbicide	Rate	Application timing	6/8	6/18	6/22	7/2	6/2	6/18	6/22	7/2	7/21	6/8	6/18	6/22	7/2	7/21
	(lb/A)		(%)													
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0	0	0
V-10029 + Kinetic (0.125%)	0.018	PREFL	0	88	86	80	0	85	79	83	91	0	95	98	98	98
V-10029 + Kinetic (0.125%)	0.02	PREFL	0	90	86	81	0	88	81	79	93	0	98	99	99	98
(Propanil + molinate)	6.0	PREFL	0	0	33	61	0	0	43	66	63	0	99	100	91	95
V-10029 + Kinetic (0.125%) fb triclopyr	0.02 + 0.28	MPOST POFL	39	75	78	88	0	79	81	91	93	68	100	100	99	100
(Propanil + molinate) fb triclopyr	4.5 + 0.28	MPOST POFL	34	74	71	89	0	71	75	90	91	92	98	92	94	98

continued

Table 1. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control: Resistant barnyardgrass (R-ECHCG) 6/8	6/18	6/22	7/2	Barnyardgrass (ECHCG) 6/2	6/18	6/22	7/2	7/21	Hemp sesbania (SEBEX) 6/8	6/18	6/22	7/2	7/21
	(lb / A)		(%)													
Pendimethalin fb V-10029 + Kinetic (0.125%)	1.0 / 0.018	DPRE / MPOST	97	98	97	99	97	98	97	99	99	58	97	99	97	99
Pendimethalin fb V-10029 + Kinetic (0.125%)	1.0 / 0.02	DPRE / MPOST	97	98	97	99	98	98	97	99	96	58	92	98	92	98
Pendimethalin fb (propanil + molinate)	1.0 / 4.5	DPRE / MPOST	97	98	97	99	98	98	97	100	95	95	98	96	87	85
Propanil fb V-10029 + Kinetic (0.125%)	3.0 / 0.02	DPRE / MPOST	73	95	97	96	81	97	97	99	100	51	96	99	97	96
Thiobencarb fb (propanil + molinate)	3.0 / 4.5	DPRE / MPOST	74	97	97	97	86	97	97	98	95	95	98	100	95	93
Thiobencarb + propanil fb V-10029 + thiobencarb + Kinetic (0.125%)	2.0 / 3.0 / 0.02 / 2.0	EPOST / MPOST	79	97	93	98	89	97	94	99	94	100	100	100	99	99
Thiobencarb + propanil fb thiobencarb + propanil	2.0 / 3.0 / 2.0 / 3.0	EPOST / MPOST	66	83	71	85	81	86	81	94	78	100	100	100	97	98
Pendimethalin fb V-10029 + bensulfuron + Kinetic (0.125%)	1.0 / 0.02 / 0.038	DPRE / MPOST	94	98	98	98	97	98	98	100	99	66	97	99	98	98
Pendimethalin fb bensulfuron + (propanil+molinate)	1.0 / 0.038 / 4.5	DPRE / MPOST	96	91	94	97	98	95	96	97	91	95	98	96	96	100

continued

Table 1. Section 1. Continued.

			Weed control													
			Resistant barnyardgrass (R-ECHCG)				Barnyardgrass (ECHCG)					Hemp sesbania (SEBEX)				
Herbicide	Rate	Application timing	6/8	6/18	6/22	7/2	6/2	6/18	6/21	7/2	7/21	6/8	6/18	6/22	7/2	7/21
	(lb/A)		----------(%)----------													
Pendimethalin fb	1.0	DPRE														
V-10029 +	0.02															
bensulfuron +	0.038															
Kinetic (0.125%)		POFL	97	88	86	99	98	90	88	97	100	14	5	8	58	100
Pendimethalin fb	1.0	DPRE														
bensulfuron	0.038	POFL	97	91	93	94	98	91	95	98	89	0	0	0	44	79
Pendimethalin fb	1.0	DPRE														
V-10029 +	0.02															
Kinetic (0.125%)		POFL	98	93	94	100	98	92	94	96	100	0	10	0	49	98
Pendimethalin fb	1.0	DPRE														
molinate	4.0	POFL	94	93	93	99	97	93	93	98	95	0	0	0	16	0
Pendimethalin fb	1.0	DPRE														
V-10029 +	0.02															
triclopyr +	0.28															
Kinetic (0.125%)		POFL	97	88	93	100	98	90	94	98	98	35	20	5	71	100
Pendimethalin fb	1.0	DPRE														
molinate fb	4.0	EPOFL														
triclopyr	0.28	PI	97	92	94	99	98	94	94	98	100	0	3	0	25	100
LSD (0.05)			9	7	7	7	4	7	6	6	6	12	11	6	11	6

continued

Table 1. Section 2. Continued.

Herbicide	Rate	Application timing	Weed control											
			Northern jointvetch (AESVI)					Palmleaf morningglory (IPOWR)					Smallflower morningglory (IAQTA)	
			6/8	6/18	6/22	7/2	7/21	6/8	6/18	6/22	7/2	7/21	6/8	6/18
	(lb/A)		(%)											
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0
V-10029 + Kinetic (0.125%)	0.018	PREFL	0	97	96	88	94	0	10	8	28	8	0	100
V-10029 + Kinetic (0.125%)	0.02	PREFL	0	100	99	94	94	0	0	0	15	0	0	100
(Propanil + molinate)	6.0	PREFL	0	99	99	94	93	0	0	0	20	19	0	100
V-10029 + Kinetic (0.125%)	0.02	MPOST												
fb triclopyr	0.28	POFL	66	98	100	98	99	0	5	8	95	98	0	100
(Propanil + molinate)	4.5	MPOST												
fb triclopyr	0.28	POFL	91	94	91	94	99	0	0	0	95	96	0	100
Pendimethalin fb V-10029 + Kinetic (0.125)	1.0 0.018	DPRE MPOST	58	99	100	96	99	0	0	0	25	0	0	100
Pendimethalin fb V-10029 + Kinetic (0.125%)	1.0 0.02	DPRE MPOST	59	98	98	90	98	0	0	0	28	0	0	100
Pendimethalin fb (propanil + molinate)	1.0 4.5	DPRE MPOST	91	98	93	86	50	0	0	0	18	0	18	100
Propanil fb V-10029 + Kinetic (0.125%)	3.0 0.02	DPRE MPOST	51	99	100	93	96	0	0	0	33	0	0	100
Thiobencarb fb (propanil + molinate)	3.0 4.5	DPRE MPOST	93	98	90	70	85	0	0	0	18	0	5	100

continued

Table 1. Section 2. Continued.

Herbicide	Rate	Application timing	Weed control: Northern jointvetch (AESVI) 6/8	6/18	6/22	7/2	7/21	Palmleaf morningglory (IPOWR) 6/8	6/18	6/22	7/2	7/21	Smallflower morningglory (IAQTA) 6/8	6/18
	(lb/A)		----------(%)----------											
Thiobencarb + propanil fb V-10029 + thiobencarb + Kinetic (0.125%)	2.0 3.0 0.02 2.0	EPOST MPOST	98	100	99	90	96	93	100	100	98	94	96	100
Thiobencarb + propanil fb thiobencarb + propanil	2.0 3.0 2.0 3.0	EPOST MPOST	100	100	100	100	96	99	95	100	100	96	100	100
Pendimethalin fb V-10029 + bensulfuron + Kinetic (0.125%)	1.0 0.02 0.038	DPRE MPOST	58	99	99	89	100	0	0	55	33	38	0	100
Pendimethalin fb bensulfuron + (propanil + molinate)	1.0 0.038 4.5	DPRE MPOST	90	98	91	85	99	0	0	0	23	0	0	100
Pendimethalin fb V-10029 + bensulfuron + Kinetic (0.125%)	1.0 0.02 0.038	DPRE POFL	25	13	21	71	99	0	0	0	49	56	0	100
Pendimethalin fb bensulfuron	1.0 0.038	DPRE POFL	0	0	0	40	54	0	0	0	51	76	0	100
Pendimethalin fb V-10029 + Kinetic (0.125%)	1.0 0.02	DPRE POFL	0	0	0	43	100	0	0	0	50	0	0	100
Pendimethalin fb molinate	1.0 4.0	DPRE POFL	18	5	3	13	0	0	0	0	13	0	0	100

continued

Table 1. Section 2. Continued.

Herbicide	Rate	Application timing	Weed control: Northern jointvetch (AESVI) 6/8	6/18	6/22	7/2	7/21	Palmleaf morningglory (IPOWR) 6/8	6/18	6/22	7/2	7/21	Smallflower morningglory (IAQTA) 6/8	6/18
	(lb/A)		(%)											
Pendimethalin fb	1.0	DPRE												
V-10029 +	0.02													
triclopyr +	0.28													
Kinetic (0.125%)		POFL	29	3	10	80	100	0	0	0	90	100	0	100
Pendimethalin fb	1.0	DPRE												
molinate fb	4.0	EPOFL												
triclopyr	0.28	PI	6	0	3	23	100	0	0	0	18	100	0	100
LSD (0.05)			12	6	8	11	11	3	6	7	18	9	8	1

continued

Table 1. Section 3.

Herbicide	Rate	Application timing	Rice injury 6/8	6/18	6/22	7/2	Rice yield 9/28
	(lb/A)		(%)				(lb/A)
Untreated check			0	0	0	0	2249
V-10029 + Kinetic	0.018						
(0.125%)		PREFL	0	9	1	0	4904
V-10029 + Kinetic	0.02						
(0.125%)		PREFL	0	9	1	0	6168
(Propanil + molinate)	6.0	PREFL	0	1	0	0	4202
V-10029 +	0.02						
Kinetic (0.125%)		MPOST					
fb triclopyr	0.28	POFL	3	0	0	0	8056
(Propanil + molinate)	4.5	MPOST					
fb triclopyr	0.28	POFL	3	1	0	0	7765

continued

Table 1. Section 3. Continued.

Herbicide	Rate	Application timing	Rice injury 6/8	6/18	6/22	7/2	Rice yield 9/28
	(lb/A)		----------(%)----------				(lb/A)
Pendimethalin fb V-10029 + Kinetic (0.125)	1.0 fb 0.018	DPRE fb MPOST	0	0	0	0	8424
Pendimethalin fb V-10029 + Kinetic (0.125%)	1.0 fb 0.02	DPRE fb MPOST	1	1	0	0	7809
Pendimethalin fb (propanil + molinate)	1.0 fb 4.5	DPRE fb MPOST	1	0	0	0	8430
Propanil fb V-10029 + Kinetic (0.125%)	3.0 fb 0.02	DPRE fb MPOST	0	1	0	0	8801
Thiobencarb fb (propanil + molinate)	3.0 fb 4.5	DPRE fb MPOST	5	0	0	0	8181
Thiobencarb + propanil fb V-10029 + thiobencarb + Kinetic (0.125%)	2.0 + 3.0 fb 0.02 + 2.0	EPOST fb MPOST	11	1	1	0	7748
Thiobencarb + propanil fb thiobencarb + propanil	2.0 + 3.0 fb 2.0 + 3.0	EPOST fb MPOST	11	0	0	0	7836
Pendimethalin fb V-10029 + bensulfuron + Kinetic (0.125%)	1.0 fb 0.02 + 0.038	DPRE fb MPOST	0	0	0	0	7751

continued

Table 1. Section 3. Continued.

Herbicide	Rate	Application timing	Rice injury 6/8	6/18	6/22	7/2	Rice yield 9/28
	(lb/A)		----------(%)----------				(lb/A)
Pendimethalin fb bensulfuron + (propanil + molinate)	1.0 0.038 4.5	DPRE MPOST	3	0	0	0	8151
Pendimethalin fb V-10029 + bensulfuron + Kinetic (0.125%)	1.0 0.02 0.038	DPRE POFL	0	1	0	0	8775
Pendimethalin fb bensulfuron	1.0 0.038	DPRE POFL	0	0	0	0	7683
Pendimethalin fb V-10029 + Kinetic (0.125%)	1.0 0.02	DPRE POFL	0	0	0	0	7782
Pendimethalin fb molinate	1.0 4.0	DPRE POFL	0	0	0	0	6026
Pendimethalin fb V-10029 + triclopyr + Kinetic (0.125%)	1.0 0.02 0.28	DPRE POFL	0	0	0	0	9183
Pendimethalin fb molinate fb triclopyr	1.0 4.0 0.28	DPRE EPOFL PI	0	0	0	0	8483
LSD (0.05)			2	2	NS	NS	788

Table 2. Carfentrazone (Aim) applied EPOST alone and in tank-mixes with standard rice herbicides, Stuttgart, 1998.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft by 16 ft
Row width / Number of rows per plot ..... 6.5 in / 9 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
%OM / pH ..... 0.9 / 5.2

Planting date ..... May 12, 1998
Harvest date ..... September 28, 1998
Crop / Variety ..... Rice / Drew
Dates of Flushing ..... May 14, 21, and June 4, 1998
Date of Flooding ..... June 16, 1998

Comments: EPOST = early postemergence; and PREFL = preflood.

Application type	EPOST	PREFL
Date applied	5/28/98	6/9/98
Time	4:00 pm	10:00 pm
Incorporation equipment	N/A	N/A
Air / Soil temperature (F)	80 / 80	85 / 82
Relative humidity (%)	90	75
Wind (mph)	1	5
Weather	cloudy	cloudy
Soil moisture	moist	moist
Crop stage / Height	2-3 lf / 6"	4-6 lf / 9"
Sprayer type / mph	BkPkCO_2 / 3	Hooded BM / 3
Nozzle type / Size	Teejet / XR11002	Teejet / XR11002
Boom ht / # Noz / Spacing (in.)	15 / 3 / 18	15 / 3 / 18
Gpa / Psi	15 / 24	15 / 22
Weed species (density)	---------- (# leaves / height) ----------	
ECHCG (9 / ft^2)	2-3 lf / 1.5-2"	5-6 lf / 4-6"
SEBEX (9 / row ft)	2-3 lf / 2-3"	5-6 lf / 4-6"
AESVI (4 / row ft)	2-3 lf / 1-2"	5-6 lf / 2-4"
IAQTA (3 / row ft)	cot.-1 lf / 0.5-1.5"	3 lf / 1-2"
IPOWR (5 row ft)	cot. - 1 lf / 1.5-2"	5-8 lf / 3-4"
ECLAL (12 / ft^2)	cot.-1 lf / 0.1"	3-6 lf / 2-3"

Conclusions: Carfentrazone at 0.02 lb/A alone or tank-mixed with thiobencarb at 4.0 lb/A, quinclorac at 0.38 lb/A, pendimethalin at 1.0 lb/A, fenoxaprop at 0.063 lb/A, or propanil at 3.0 lb/A at the EPOST timing controlled the broadleaf weed spectrum present. Carfentrazone will need to be tank-mixed with quinclorac, fenoxaprop, or propanil to prevent yield loss from inadequate control of barnyardgrass infestations in rice.

Table 2. Section 1.

			Weed control								
			Barnyardgrass (ECHCG)				Smallflower morningglory (IAQTA)			Common purslane (POROL)	Eclipta (ECLAL)
Herbicide	Rate	Application timing	6/2	6/8	6/26	7/21	6/2	6/8	6/17	6/2	6/8
	(lb/A)		(%)								
Untreated check			0	0	0	0	0	0	0	0	0
Carfentrazone + AG-98 (0.25%)	0.02	EPOST	40	68	48	0	100	100	100	100	99
Carfentrazone + thiobencarb	0.02 4.0	EPOST	66	80	89	58	100	99	100	100	98
Carfentrazone + quinclorac + AG-98 (0.25%)	0.02 0.38	EPOST	95	93	96	100	100	100	100	100	100
Carfentrazone + pendimethalin	0.02 0.75	EPOST	48	75	60	29	100	99	100	100	100
Carfentrazone + fenoxaprop	0.02 0.063	EPOST	91	98	97	100	100	100	100	100	100
Carfentrazone +propanil	0.02 + 3.0	EPOST	89	98	95	75	90	100	100	100	100
Halosulfuron + Induce (0.25%)	0.06	EPOST	13	72	48	25	23	55	14	64	95
Bensulfuron +Agri-Dex (1%)	0.038	EPOST	5	40	46	48	18	71	99	68	93
Propanil + bensulfuron fb propanil + bensulfuron	3.0+0.019 3.0+0.019	EPOST PREFL	0	55	68	61	68	95	100	66	94
LSD (0.05)			17	20	18	23	18	17	13	19	6

continued

Table 2. Section 2.

Herbicide	Rate	Application timing	Weed control: Palmleaf morningglory (IPOWR) 6/2	6/8	6/17	7/21	Hemp sesbania (SEBEX) 6/2	6/8	6/17	6/26	7/21
	(lb/A)		(%)								
Untreated check			0	0	0	0	0	0	0	0	0
Carfentrazone + AG-98 (0.25%)	0.02	EPOST	100	100	99	100	100	100	99	99	100
Carfentrazone + thiobencarb	0.02 4.0	EPOST	100	99	100	100	100	98	100	99	100
Carfentrazone + quinclorac + AG-98 (0.25%)	0.02 0.38	EPOST	100	100	100	100	100	100	100	99	100
Carfentrazone + pendimethalin	0.02 0.75	EPOST	100	99	100	100	100	100	100	98	100
Carfentrazone + fenoxaprop	0.02 0.063	EPOST	100	100	100	100	100	100	100	99	100
Carfentrazone + propanil	0.02 + 3.0	EPOST	100	100	100	100	100	100	100	99	100
Halosulfuron + Induce (0.25%)	0.06	EPOST	18	38	10	100	61	96	100	99	98
Bensulfuron + Agri-Dex (1%)	0.038	EPOST	24	59	99	100	46	96	100	99	100
Propanil + bensulfuron fb propanil + bensulfuron	3.0 + 0.019 3.0 + 0.019	EPOST PREFL	28	91	100	100	31	98	100	99	100
LSD (0.05)			9	15	9	0	4	9	1	1	2

continued

Table 2. Section 3.

Herbicide	Rate	Application timing	Weed control: Northern jointvetch (AESVI) 6/2	6/8	6/17	6/26	7/21	Rice injury 6/2	6/8	6/17	6/26	Rice yield
	(lb/A)		(%)					(%)				(lb/A)
Untreated check			0	0	0	0	0	0	0	0	0	2094
Carfentrazone + AG-98 (0.25%)	0.02	EPOST	93	100	93	89	100	20	9	0	0	1792
Carfentrazone + thiobencarb	0.02 4.0	EPOST	99	98	90	65	94	20	9	0	0	6427
Carfentrazone + quinclorac + AG-98 (0.25%)	0.02 0.38	EPOST	100	100	100	98	100	18	8	0	0	8031
Carfentrazone + pendimethalin	0.02 0.75	EPOST	93	100	90	50	86	0	9	0	0	4322
Carfentrazone + fenoxaprop	0.02 0.063	EPOST	88	100	85	45	73	34	21	0	0	8070
Carfentrazone +propanil	0.02 + 3.0	EPOST	100	100	98	99	98	19	10	0	0	7233
Halosulfuron + Induce (0.25%)	0.06	EPOST	68	95	100	92	98	0	8	0	0	5649
Bensulfuron +Agri-Dex (1%)	0.038	EPOST	49	95	98	97	100	4	5	0	0	4883
Propanil + bensulfuron fb propanil + bensulfuron	3.0+0.019 3.0+0.019	EPOST PREFL	48	96	100	99	100	0	8	0	0	5774
LSD (0.05)			12	4	8	21	12	10	6	NS	NS	1315

Table 3. Comparison of clomazone (Command) and standard programs under non-flushed conditions, Stuttgart, 1998.

TEST INFORMATION

Location	Stuttgart
Experimental Design / replications	RCB / 4
Plot size	6 ft by 16 ft
Row width / Number of rows per plot	6.5 in / 9 rows
Soil type	Crowley silt loam (8% sand, 75% silt, 16% clay)
%OM / pH	0.9 / 5.2
Planting date	May 12, 1998
Harvest date	September 29, 1998
Crop / Variety	Rice / Drew
Dates of Flushing	June 4 and 9, 1998
Date of Flooding	June 16, 1998

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

Application type	PPI	PRE	DPRE
Date applied	May 11, 1998	May 12, 1998	May 18, 1998
Time	7:00 pm	10:00 am	12:00 pm
Incorporation equipment	Triple-K	N/A	N/A
Air / Soil temperature (F)	75 / 80	82 / 80	92 / 90
Relative humidity (%)	85	65	45
Wind (mph)	3	5	4
Weather	mostly clear	clear	clear
Soil moisture	moist	moist	dry
Crop stage / Height	N/A	N/A	Spike / 1"
Sprayer type / mph	BkPkCO$_2$ / 3	BkPkCO$_2$ / 3	BkPkCO$_2$ / 3
Nozzle type / Size	Teejet / XR11002	Teejet / XR11002	Teejet / XR11002
Boom ht / # Noz / Spacing (in.)	15 / 3 / 18	15 / 3 / 18	15 / 3 / 18
Gpa / Psi	15 / 24	15 / 24	15 / 24
Weed species (density)	----------(# leaves / height)----------		
ECHCG (50 / ft^2)	N/A	N/A	N/A

Conclusions: Clomazone gave season-long control of barnyardgrass at 0.4 lb ai / A with decreased control at 0.2 lb / A by July 20. Chlorosis ratings show higher injury with PPI applications and less injury at PRE and DPRE timings. Decreased control of barnyardgrass had a significant effect on yield, with clomazone at 0.4 lb/A giving the highest rough rice yields regardless of application timing.

Table 3. Section 1.

Herbicide	Rate	Application timing	Weed control: Barnyardgrass (ECHCG) Propanil-susceptible 6/2	6/11	6/18	7/20	P-Resistant 6/11	Rice flatsedge (CYPIR) 6/18	7/20	Eclipta (ECLAL) 6/11	Amazon sprangletop (LEFPA) 7/20
		(lb/A)	(%)								
Untreated check			0	0	0	0	0	0	99	0	50
Clomazone	0.2	PPI	92	84	94	76	88	89	62	67	99
Clomazone	0.4	PPI	98	99	99	98	86	91	67	68	99
Clomazone	0.2	PRE	89	71	74	49	73	70	65	70	99
Clomazone	0.4	PRE	99	94	98	99	96	87	67	73	99
Clomazone	0.2	DPRE	91	85	90	84	90	92	87	94	99
Clomazone	0.4	DPRE	98	95	99	99	92	96	58	80	99
Quinclorac	0.375	DPRE	98	99	94	99	91	97	95	95	61
Pendimethalin	1.0	DPRE	90	74	81	66	86	96	99	75	99
Thiobencarb	4.0	DPRE	93	56	71	69	23	90	97	53	99
LSD (0.05)			8	25	18	26	20	14	28	38	27

continued

Table 3. Section 2.

Herbicide	Rate	Application timing	Rice injury: Chlorosis 5/26	6/2	6/11	6/18	7/20	Biomass reduction 5/26	6/2	6/11	6/18	7/20	Rice yield 9/29
		(lb/A)	(%)										(lb/A)
Untreated check			0	0	0	0	0	0	0	0	0	0	781
Clomazone	0.2	PPI	25	9	6	1	0	0	0	4	1	0	6058
Clomazone	0.4	PPI	55	28	15	11	0	0	0	6	3	0	7757
Clomazone	0.2	PRE	8	3	0	0	0	0	0	0	0	0	5100
Clomazone	0.4	PRE	13	3	3	0	0	0	0	1	0	0	7142
Clomazone	0.2	DPRE	1	0	0	0	0	0	0	0	0	0	6018
Clomazone	0.4	DPRE	8	3	10	0	0	0	0	0	0	0	7796
Quinclorac	0.375	DPRE	0	0	0	0	0	0	0	0	0	0	6716
Pendimethalin	1.0	DPRE	0	0	0	0	0	0	0	3	0	0	5747
Thiobencarb	4.0	DPRE	0	0	0	0	0	0	0	0	0	0	6109
LSD (0.05)			8	6	3	2	NS	NS	NS	4	NS	NS	1682

Table 4. Weed control with glufosinate (Liberty) in rice, Stuttgart, 1998.

TEST INFORMATION

Location	Stuttgart
Experimental Design / replications	RCB / 4
Plot size	6 ft by 16 ft
Row width / Number of rows per plot	6.5 in / 9 rows
Soil type	Crowley silt loam (8% sand, 75% silt, 16% clay)
%OM / pH	0.9 / 5.2
Planting date	May 12, 1998
Harvest date	August 3, 1998
Crop / Variety	Rice / Drew
Dates of Flushing	May 14, 21, and June 4, 1998
Date of Flooding	June 16, 1998

Comments: EPOST = early postemergence and PREFL = preflood.

Application type	EPOST	PREFL
Date applied	May 28, 1998	June 9, 1998
Time	4:00 pm	10:00 am
Incorporation equipment	N/A	N/A
Air / Soil temperature (F)	80 / 80	85 / 82
Relative humidity (%)	90	75
Wind (mph)	1	5
Weather	cloudy	cloudy
Soil moisture	moist	moist
Crop stage / Height	2-3 lf / 6"	4-6 lf / 8"
Sprayer type / mph	BkPkCO_2 / 3	Hooded BM / 3
Nozzle type / Size	Teejet / XR11002	Teejet / XR11002
Boom ht / # Noz / Spacing (in.)	15 / 3 / 18	15 / 3 / 18
Gpa / Psi	15 / 24	15 / 22
Weed species (density)	---------- (# leaves / height) ----------	
R-ECHCG (15 / row ft)	2-3 lf / 1.5"	5-6 lf / 4-6"
ECHCG (12 / row ft)	2-3 lf / 1.5"	5-6 lf / 4-6"
SEBEX (9 / row ft)	2-3 lf / 3"	5-6 lf / 6"
AESVI (4 / row ft)	2-3 lf / 2.5"	4-5 lf / 4"
IAQTA (3 / row ft)	cot. - 1 lf / 1-2"	3 lf / 1-2"
IPOWR (5 / row ft)	cot. - 1 lf / 1.5-2"	3-5 lf / 3-4"
ECLAL (12 / ft^2)	cot. - 1 lf / 0.1"	3-6 lf / 2-4"

Conclusions: Glufosinate at all rates and timings provided excellent season-long weed control of all weeds present except northern jointvetch. Northern jointvetch was controlled only by glufosinate at 0.25 and 0.35 lb/A applied at the PREFL timing. Glufosinate at all rates and timings was better than the standard of 3 lb/A propanil fb 3 lb/A propanil on smallflower morningglory, palmleaf morningglory, and propanil-resistant barnyardgrass. The highest yielding treatments in this study were glufosinate fb glufosinate at 0.375 lb/A applied EPOST fb PREFL and glufosinate at 0.25 lb/A applied EPOST and EPOST fb PREFL

Table 4. Section 1.

			Weed control									
			Barnyardgrass (ECHCG)								Palmleaf morningglory (IPOWR)	
			Resistant				Susceptible					
Herbicide	Rate	Application timing	6/2	6/8	6/26	7/21	6/2	6/8	6/26	7/21	6/2	6/8
	(lb/A)		(%)									
Untreated check			0	0	0	0	0	0	0	0	0	0
Glufosinate	0.25	EPOST	85	100	97	96	93	100	99	98	99	100
Glufosinate	0.25	PREFL			94	93			98	96		
Glufosinate fb	0.25	EPOST										
glufosinate	0.25	PREFL	91	100	99	100	100	99	99	100	96	98
Glufosinate	0.375	EPOST	96	100	99	98	99	100	99	96	98	100
Glufosinate	0.375	PREFL			94	100			96	100		
Glufosinate fb	0.375	EPOST										
glufosinate	0.375	PREFL	91	100	99	100	98	100	99	100	99	100
Propanil fb	3.0	EPOST										
propanil	3.0	PREFL	8	20	0	15	91	98	84	95	33	58
LSD (0.05)			11	5	6	7	8	4	12	4	12	5

continued

Table 4. Section 2.

			Weed control									
			Hempsesbania (SEBEX)				Northern jontvetch (AESVI)				Smallflower morningglory (IAQTA)	
Herbicide	Rate	Application timing	6/2	6/8	6/26	7/21	6/2	6/8	6/26	7/21	6/2	7/21
	(lb/A)		(%)									
Untreated check			0	0	0	0	0	0	0	0	0	0
Glufosinate	0.25	EPOST	100	100	99	98	100	99	35	31	96	100
Glufosinate	0.25	PREFL			99	100			87	98		98
Glufosinate fb	0.25	EPOST										
glufosinate	0.25	PREFL	100	100	99	100	96	100	62	64	100	100
Glufosinate	0.375	EPOST	100	100	99	100	99	100	33	48	95	100
Glufosinate	0.375	PREFL			99	99			75	89		100
Glufosinate fb	0.375	EPOST										
glufosinate	0.375	PREFL	100	100	99	99	98	100	72	74	100	100
Propanil fb	3.0	EPOST										
propanil	3.0	PREFL	100	100	99	100	99	100	82	100	99	23
LSD(0.05)			1	1	1	2	5	2	28	24	5	4

continued

Table 4. Section 3.

			Weed control								
			Common purslane (POROL)		Eclipta (ECLAL)		Rice injury				Rice yield
Herbicide	Rate	Application timing	6/2	6/8	6/8	6/26	6/2	6/8	6/26	7/21	8/3
	(lb/A)		(%)								(lb/A)
Untreated check			0	0	0	0	0	0	0	0	2432
Glufosinate	0.25	EPOST	100	100	100	98	18	18	0	0	6117
Glufosinate	0.25	PREFL				99			0	0	5775
Glufosinate fb	0.25	EPOST									
glufosinate	0.25	PREFL	100	100	100	99	18	16	0	0	5780
Glufosinate	0.375	EPOST	100	100	100	99	25	23	0	0	5545

continued

Table 4. Section 3. Continued.

Herbicide	Rate	Application timing	Weed control: Common purslane (POROL) 6/2	Common purslane (POROL) 6/8	Eclipta (ECLAL) 6/8	Eclipta (ECLAL) 6/26	Rice injury 6/2	Rice injury 6/8	Rice injury 6/26	Rice injury 7/21	Rice yield 8/3
	(lb/A)		(%)								(lb/A)
Glufosinate	0.375	PREFL				97			0	0	5536
Glufosinate fb glufosinate	0.375 fb 0.375	EPOST fb PREFL	100	100	100	99	29	21	0	0	6585
Propanil fb propanil	3.0 fb 3.0	EPOST fb PREFL	100	98	99	96	1	13	0	0	5554
LSD(0.05)			1	3	2	3	14	9	NS	NS	530

Table 5. Levee control with clomazone (Command) and quinclorac (Facet), Stuttgart, 1998.

TEST INFORMATION

Location	Stuttgart
Experimental Design/replications	RCB / 4
Plot size	6 ft by 26 ft
Row width / Number of rows per plot	6.5 in / 9 rows
Soil type	Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH	1.0 / 5.2
Planting date	May 11, 1998
Harvest date	September 30, 1998
Crop/Variety	Rice/Drew
Dates of Flushing	May 14, 21, and June 4, 1998
Date of Flood	June 9, 1998

Comments: PPI= preplant incorporated; PRE = preemergence.

Application type	PPI	PRE
Date applied	May 11, 1998	May 13, 1998
Time	7:00 pm	9:00 am
Incorporation equipment	Triple-K	N/A
Air/Soil temperature (F)	75/80	81/78
Relative humidity (%)	85	75
Wind (mph, direction)	3	3
Weather	mostly clear	mostly clear
Soil moisture	moist	moist
Crop stage/Height	N/A	N/A
Sprayer type/mph	BkPkCO_2 / 3	BkPkCO_2 / 3
Nozzle type/Size	Teejet / XR11002	Teejet / XR11002
Boom ht / # Noz / Spacing (in.)	15 / 3 / 18	15 / 3 / 18
Gpa / Psi	15/24	15/24
Weed species (density)	---------- (# leaves / height) ----------	
ECHCG (25/ft^2)	N/A	N/A

Conclusions: All herbicide treatments were ineffective for season-long control of barnyardgrass on the levee. Herbicide rates of clomazone at 0.2 lb/A and quinclorac at 0.25 lb/A were too low to control barnyardgrass on levees.

Table 5. Section 1.

Herbicide	Rate	Application timing	Barnyardgrass (ECHCG) control											
			5/27		6/2		6/11		6/18		7/1		7/21	
			Plot	Levee	Plot	Levee	Plot	Levee	Plot	Levee	Plot	Levee	Plot	Levee
	(lb/A)		----------(%)----------											
Untreated check			0	0	0	0	0	0	0	10	0	0	3	0
Clomazone (pull levee)	0.2	PPI	28	56	8	13	20	13	25	45	5	0	0	0
Clomazone (pull levee)	0.2	PPI												
fb clomazone	0.2	PRE												
(spray levee only)			88	86	96	68	98	90	96	75	97	45	91	35
Clomazone (pull levee)	0.2	PRE	90	68	99	25	96	50	98	50	98	32	93	0
Clomazone (pull levee)	0.2	PRE												
fb clomazone	0.2	PRE												
(spray levee only)			68	79	99	83	97	86	98	78	99	60	98	20
Pull levee; clomazone	0.2	PRE												
(spray plot & levee)			90	89	98	86	99	73	94	79	99	50	92	0
Quinclorac (pull levee)	0.25	PPI	23	23	23	21	18	13	26	34	13	8	0	0
Quinclorac (pull levee)	0.25	PPI												
fb quinclorac	0.25	PRE												
(spray levee only)			30	46	15	56	25	53	20	69	18	49	5	0
Quinclorac (pull levee)	0.25	PRE	94	58	97	30	93	21	91	55	99	28	97	0
Quinclorac (pull levee)	0.25	PRE												
fb quinclorac	0.25	PRE												
(spray levee only)			94	51	98	53	96	83	95	86	97	73	99	63
Pull levee; quinclorac	0.25	PRE												
(spray plot & levee)			94	86	94	84	87	74	88	83	92	73	85	15
LSD (0.05)			36	40	23	33	20	31	21	22	11	33	10	27

continued

Table 5. Section 2.

Herbicide	Rate	Application timing	Barnyardgrass (ECHCG) control 5/27 Plot	5/27 Levee	6/2 Plot	6/2 Levee	6/11 Plot	6/11 Levee	6/18 Plot	6/18 Levee	7/1 Plot	7/1 Levee	7/21 Plot	7/21 Levee	Rice yield
	(lb/A)		(%)												(lb/A)
Untreated check			0	0	0	0	0	0	0	0	0	0	0	0	0
Clomazone (pull levee)	0.2	PPI	0	0	0	0	0	1	0	0	0	0	0	0	153
Clomazone (pull levee)	0.2	PPI													
fb clomazone	0.2	PRE													
(spray levee only)			15	1	0	0	2	8	0	3	0	0	0	0	1494
Clomazone (pull levee)	0.2	PRE	4	5	0	0	1	13	0	5	0	0	0	0	245
Clomazone (pull levee)	0.2	PRE													
fb clomazone	0.2	PRE													
(spray levee only)			3	5	0	0	0	8	0	5	0	0	0	0	821
Pull levee; clomazone	0.2	PRE													
(spray plot & levee)			3	0	0	0	0	1	0	0	0	0	0	0	929
Quinclorac (pull levee)	0.25	PPI	0	0	0	0	0	0	0	0	0	0	0	0	0
Quinclorac (pull levee)	0.25	PPI													
fb quinclorac	0.25	PRE													
(spray levee only)			0	0	0	0	0	0	0	0	0	0	0	0	581
Quinclorac (pull levee)	0.25	PRE	0	0	0	0	0	0	0	0	0	0	0	0	313
Quinclorac (pull levee)	0.25	PRE													
fb quinclorac	0.25	PRE													
(spray levee only)			1	0	10	0	0	0	0	0	0	0	0	0	921
Pull levee; quinclorac	0.25	PRE													
(spray plot & levee)			0	0	0	0	0	0	0	0	0	0	0	0	726
LSD (0.05)			5	3	4	NS	NS	3	NS	2	NS	NS	NS	NS	599

Table 6. Triclopyr (Grandstand) mixtures, Stuttgart, 1998.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft by 16 ft
Row width / Number of rows per plot ..... 6.5 in / 9 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
%OM / pH ..... 1.0 / 5.2

Planting date ..... May 12, 1998
Harvest date ..... September 28, 1998
Crop / Variety ..... Rice / Drew
Dates of Flushing ..... May 14, 21, and June 4, 1998
Date of Flood ..... June 16, 1998

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

Application type	EPOST	PI
Date applied	May 28, 1998	June 30, 1998
Time	4:00 pm	2:30 pm
Incorporation equipment	N/A	N/A
Air / Soil temperature (F)	80 / 80	91 / 80
Relative humidity (%)	90	63
Wind (mph, direction)	3	6
Weather	cloudy	mostly cloudy
Soil moisture	wet	flooded
Crop stage / Height	2-3 lf / 6"	3-4 tillers / 15"
Sprayer type / mph	BkPkCO_2 / 3	BkPkCO_2 / 3
Nozzle type / Size	Teejet / XR11002	Teejet / XR11002
Boom ht / # Noz / Spacing (in.)	15 / 3 / 18	15 / 3 / 18
Gpa / Psi	15 / 24	15 / 24
Weed species (density)	---------- (# leaves / height) ----------	
R-ECHCG (15 / row ft)	2-3 lf / 1"	3-4 tillers / 14-16"
ECHCG (15 / row ft)	2-3 lf / 1"	3-4 tillers / 14-16"
SEBEX (4 / row ft)	2-3 lf / 2"	11-13 lf / 31"
AESVI (9 / row ft)	2-3 lf / 1.5"	14-16 lf / 17-19"
IPOWR (5 / row ft)	cot. - 1 lf / 2"	12-14 lf / 27"
ECLAL (2 / ft^2)	cot. -1lf / 0.1"	12-14 lf / 10-12"

Conclusions: All treatments gave excellent control of smallflower and palmleaf morninglories, hemp sesbania, and eclipta (>94%). Treatments containing triclopyr (Grandstand) plus propanil in combination with pendimethalin, quinclorac, or thiobencarb gave good control (>88%) of resistant and susceptible barnyardgrass at the later rating dates. The highest numerical yield was obtained with the treatment of triclopyr + propanil + quinclorac.

Table 6. Section 1.

Herbicide	Rate	Application timing	Weed control: Barnyardgrass (ECHCG) Resistant 6/8	Barnyardgrass (ECHCG) Resistant 6/22	Barnyardgrass (ECHCG) Susceptible 6/8	Barnyardgrass (ECHCG) Susceptible 6/22	Barnyardgrass (ECHCG) Susceptible 7/21	Palmleaf morningglory (IPOWR) 6/8	Palmleaf morningglory (IPOWR) 6/22	Palmleaf morningglory (IPOWR) 7/21	Hemp sesbania (SEBEX) 6/8	Hemp sesbania (SEBEX) 6/22	Hemp sesbania (SEBEX) 7/21
	(lb/A)		(%)										
Untreated check			0	0	0	0	0	0	0	0	0	0	0
Triclopyr + propanil	0.19 + 4.0	EPOST	55	58	64	71	40	95	100	99	100	100	99
Triclopyr + (propanil + molinate)	0.19 4.5	EPOST	50	71	76	80	71	100	100	99	100	100	99
Triclopyr + propanil + pendimethalin	0.19 + 4.0 + 1.0	EPOST	68	88	88	92	90	100	100	100	100	100	100
Triclopyr + (propanil + molinate) + pendimethalin	0.19 4.5 1.0	EPOST	61	60	74	71	69	99	100	100	100	98	100
Triclopyr + propanil + quinclorac	0.19 + 4.0 + 0.25	EPOST	94	95	97	95	97	100	100	100	100	100	100
Triclopyr + (propanil + molinate) + quinclorac	0.19 4.5 0.25	EPOST	92	97	98	97	99	100	100	100	100	100	100
Triclopyr + propanil + thiobencarb	0.19 + 4.0 + 3.0	EPOST	80	89	90	91	86	99	100	100	100	100	100
Triclopyr + (propanil + molinate) + thiobencarb	0.19 4.5 3.0	EPOST	60	78	73	85	74	98	100	100	100	100	100
Propanil + pendimethalin	4.0 1.0	EPOST	58	85	78	88	76	94	100	99	100	100	99
Triclopyr + propanil fb triclopyr + propanil	0.19 + 4.0 EPOST 0.25 1.0	PI	60	55	75	64	82	100	100	100	100	100	100
LSD (0.05)			13	13	14	12	20	5	1	2	1	2	2

continued

Table 6. Section 2.

Herbicide	Rate	Application timing	Weed control: Northern jointvetch (AESVI) 6/8	Northern jointvetch (AESVI) 6/22	Northern jointvetch (AESVI) 7/21	Smallflower morningglory (IAQTA) 6/8	Eclipta (ECLAL) 6/22	Rice injury 6/8	Rice injury 6/22	Rice yield 9/28
	(lb/A)		(%)							
Untreated check			0	0	0	0	0	0	0	1822
Triclopyr + propanil	0.19 + 4.0	EPOST	94	96	90	100	100	0	0	4847
Triclopyr + (propanil + molinate)	0.19 4.5	EPOST	95	96	91	100	100	3	0	5717
Triclopyr + propanil + pendimethalin	0.19 + 4.0 + 1.0	EPOST	99	99	100	100	100	4	0	6521
Triclopyr + (propanil + molinate) + pendimethalin	0.19 4.5 1.0	EPOST	97	100	98	100	100	3	0	5064
Triclopyr + propanil + quinclorac	0.19 + 4.0 + 0.25	EPOST	100	100	100	100	100	5	1	6892
Triclopyr + (propanil + molinate) + quinclorac	0.19 4.5 0.25	EPOST	100	100	100	100	100	1	0	6152
Triclopyr + propanil + thiobencarb	0.19 + 4.0 + 3.0	EPOST	99	98	48	100	100	15	1	6341
Triclopyr + (propanil + molinate) + thiobencarb	0.19 4.5 3.0	EPOST	98	99	55	100	100	4	0	6069
Propanil + pendimethalin	4.0 1.0	EPOST	98	98	95	100	100	3	0	5771
Triclopyr + propanil fb triclopyr + propanil	0.19 + 4.0 EPOST 0.25 1.0	PI	95	96	100	100	100	1	0	5651
LSD(0.05)			4	4	14	1	1	5	NS	826

Table 7. Evaluation of injury and efficacy of quinclorac (Facet) and clomazone (Command) applied PPI and PRE, Stuttgart, 1998.

TEST INFORMATION

Location	Stuttgart
Experimental Design / replications	RCB / 4
Plot size	6 ft by 16 ft
Row width / Number of rows per plot	6.5 in / 9 rows
Soil type	Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH	1.0 / 5.2
Planting date	May 11, 1998
Harvest date	September 29, 1998
Crop/Variety	Rice / Drew
Dates of Flushing	May 14, 21, June 4 and 9, 1998
Date of Flood	June 16, 1998

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

Application type	PPI	PRE	DPRE
Date applied	May 11, 1998	May 12, 1998	May 18, 1998
Time	7:00 pm	10:00 am	12:00 pm
Incorporation equipment	Triple-K	N/A	N/A
Air/Soil temperature (F)	75/80	82/80	92/82
Relative humidity (%)	85	65	45
Wind (mph, direction)	3	5	4
Weather	mostly clear	clear	clear
Soil moisture	moist	moist	wet
Crop stage/Height	N/A	N/A	spiking / 0.25"
Sprayer type/mph	BkPkCO_2 / 3	BkPkCO_2 / 3	BkPkCO_2 / 3
Nozzle type/Size	Teejet / XR11002	Teeject / XR11002	Teejet / XR11002
Boom ht / # Noz / Spacing (in.)	15/3/18	15/3/18	15/3/18
Gpa / Psi	15/24	15/24	15/24
Weed species (density)	----------	(# leaves / height)	----------
ECHCG (40/ft^2)	N/A	N/A	N/A

Conclusions: Barnyardgrass control was slightly lower by July 20 with clomazone at 0.1 lb/A applied PRE and DPRE than with higher rates. Chlorosis injury was highest for PPI treatments with PRE and DPRE timings showing less chlorosis. Overall, clomazone provided excellent control of barnyardgrass and Amazon sprangletop (>94%) at all timings with rates >0.3 lb/A. Clomazone, however, lacks control of rice flatsedge, and a herbicide program will be needed for control.

Table 7. Section 1.

			Weed control						
			Barnyardgrass (ECHCG)					Amazon sprangletop (LEFPA)	Rice flatsedge (CYPIR)
Herbicide	Rate	Application timing	5/27	6/2	6/17	7/1	7/20	7/20	6/17
	(lb/A)		(%)						
Untreated check			0	0	0	0	0	99	0
Quinclorac	0.25	PPI	81	77	71	93	99	49	94
Quinclorac	0.375	PPI	88	89	52	98	97	28	90
Quinclorac	0.5	PPI	88	81	55	99	98	35	76
Clomazone	0.1	PPI	94	98	96	89	86	91	81
Clomazone	0.2	PPI	81	98	93	98	93	95	76
Clomazone	0.3	PPI	88	99	99	99	99	99	58
Clomazone	0.4	PPI	94	99	99	99	99	99	77
Clomazone	0.5	PPI	94	98	98	99	99	99	47
Quinclorac	0.25	PRE	91	97	79	98	97	45	93
Quinclorac	0.375	PRE	95	89	78	99	99	70	95
Quinclorac	0.5	PRE	95	99	76	97	99	52	94
Clomazone	0.1	PRE	94	99	93	89	92	95	86
Clomazone	0.2	PRE	89	99	98	99	92	92	68
Clomazone	0.3	PRE	93	98	99	99	99	99	66
Clomazone	0.4	PRE	90	99	98	97	94	94	61
Clomazone	0.5	PRE	91	99	99	99	99	99	85
Clomazone	0.1	DPRE	93	98	97	98	92	97	91
Clomazone	0.2	DPRE	95	99	99	99	99	99	92
Clomazone	0.3	DPRE	94	99	96	99	99	94	97
Clomazone	0.4	DPRE	95	99	98	99	99	99	94
Clomazone	0.5	DPRE	94	99	99	99	99	99	93
Quinclorac	0.375	DPRE	95	98	94	99	99	92	98
Pendimethalin	1.0	DPRE	94	98	99	99	98	99	99
Thiobencarb	4.0	DPRE	94	99	94	98	98	99	98
LSD (0.05)			9	14	15	9	6	21	30

Table 7. Section 2.

Herbicide	Rate	Application timing	Effect on rice: Chlorosis 5/27	Chlorosis 6/2	Chlorosis 6/17	Chlorosis 7/1	Chlorosis 7/20	Biomass reduction 6/2	Biomass reduction 6/17	Biomass reduction 7/1	Biomass reduction 7/20	Yield 9/29
		(lb/A)	(%)									(lb/A)
Untreated check			0	0	0	0	0	0	0	0	0	3762
Quinclorac	0.25	PPI	0	0	0	0	0	0	0	0	0	7331
Quinclorac	0.375	PPI	0	0	0	0	0	6	5	0	0	6792
Quinclorac	0.5	PPI	1	0	0	0	0	0	3	0	0	6474
Clomazone	0.1	PPI	1	0	0	0	0	0	0	0	0	7321
Clomazone	0.2	PPI	10	3	0	0	0	0	0	0	0	7200
Clomazone	0.3	PPI	27	13	0	0	0	2	0	0	0	6979
Clomazone	0.4	PPI	60	25	2	0	0	13	1	0	0	7345
Clomazone	0.5	PPI	60	36	2	0	0	13	0	0	0	6751
Quinclorac	0.25	PRE	0	0	0	0	0	0	0	0	0	7231
Quinclorac	0.375	PRE	0	0	0	0	0	0	0	0	0	6924
Quinclorac	0.5	PRE	0	0	0	0	0	0	3	0	0	6409
Clomazone	0.1	PRE	0	0	0	0	0	0	0	0	0	7408
Clomazone	0.2	PRE	3	0	0	0	0	0	0	0	0	6930
Clomazone	0.3	PRE	18	5	1	0	0	1	0	0	0	6951
Clomazone	0.4	PRE	3	0	0	0	0	0	0	0	0	7828
Clomazone	0.5	PRE	28	6	0	0	0	0	1	0	0	7247
Clomazone	0.1	DPRE	0	0	0	0	0	0	0	0	0	7154
Clomazone	0.2	DPRE	0	0	0	0	0	0	0	0	0	8177
Clomazone	0.3	DPRE	3	0	0	0	0	0	0	0	0	7816
Clomazone	0.4	DPRE	18	4	0	0	0	0	0	0	0	7994
Clomazone	0.5	DPRE	14	3	0	0	0	0	0	0	0	8273
Quinclorac	0.375	DPRE	0	0	0	0	0	0	0	3	0	7674
Pendimethalin	1.0	DPRE	0	0	0	0	0	0	0	0	0	8229
Thiobencarb	4.0	DPRE	0	0	0	0	0	0	0	0	0	6854
LSD (0.05)			12	7	1	NS	NS	6	2	1	NS	1531

Table 8. Evaluation of quinclorac (Facet) formulations (DF vs. GR) at two water depths and two grass stages, Stuttgart, 1998.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... Split block / 4
Plot size ..... 6 ft by 16 ft
Row width / Number of rows per plot ..... 6.5 in / 9 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
%OM / pH ..... 1.0 / 5.2

Planting date ..... May 12, 1998
Harvest date ..... September 28, 1998
Crop/Variety ..... Rice/Drew
Dates of Flushing ..... May 14, 21, and June 4, 1998
Date of Flood ..... June 16, 1998

Comments: POFL = post-flood. The dry flowable (DF) and granular (GR) formulations of quinclorac were compared at each flood depth. Propanil (Stam) was applied preflood to selected plots to establish a barnyardgrass height differential (10-12" and 14-16").

Application type	POFL
Date applied	June 23, 1998
Time	11:30 am
Incorporation equipment	N/A
Air / Soil temperature (F)	98 / 90
Relative humidity (%)	45
Wind (mph, direction)	5
Weather	clear
Soil moisture	flooded
Crop stage / Height	8-10 lf / 14"
Sprayer type / mph	Bk$Pk CO_2$ / 3
Nozzle type / Size	Teeject / TJ11002
Boom ht / # Noz / Spacing (in.)	15 / 3 / 18
Gpa / Psi	15 / 24
Weed species (density)	---------- (# leaves / height) ----------
ECHCG (16/ft^2)	10-12" or 14-16" (treatment dependent)
LEFSP (10/ft^2)	13 lf - 4 tiller / 10"

Conclusions:

0.5-1.5 inch flood depth: Quinclorac (DF) at 0.38 lb / A provided good control of 10-12" barnyardgrass, and was less effective on 14-16" barnyardgrass at this flood depth. The granular (GR) formulation of quinclorac at 0.38 lb / A was ineffective on both 10-12" and 14-16" barnyardgrass in the 0.5-1.5 inch flood depth.

4-5 inch flood depth: Quinclorac (DF) at 0.38 lb / A provided good control of 10-12" and 14-16" barnyardgrass which was comparable to the standard herbicide molinate at 0.3 lb / A applied to the same barnyardgrass stages. Quinclorac (GR) at 0.38 lb / A provided fair control of 10-12" barnyardgrass and poor control or 14-16" barnyardgrass.

Table 8.

			Weed control									
			Barnyardgrass (ECHCG)			Sprangletop species (LEFSP)			Effect on rice Injury			
Herbicide	Rate	Application timing	7/8	7/28	8/12	7/8	7/28	8/12	7/8	7/28	8/12	Yield 9/28
	(lb / A)	(barnyardgrass stage)	(%)									(lb / A)
Application made to rice with a 0.5-1.5" flood:												
Untreated check			0	0	0	0	0	0	0	0	0	1131
Quinclorac (DF) +	0.38											
Agri-Dex (1.25%)		10-12"	75	81	83	74	73	74	3	0	0	6429
Quinclorac (GR)	0.38	10-12"	41	55	43	26	58	40	0	0	0	2285
Quinclorac (DF) +	0.38											
Agri-Dex (1.25%)		14-16"	61	65	68	61	60	71	5	0	0	4945
Quinclorac (GR)	0.38	14-16"	38	41	24	29	44	35	0	0	0	1578
Application made to rice with a 4-5" flood:												
Untreated check			0	0	0	0	0	0	0	0	0	1991
Quinclorac (DF) +	0.38											
Agri-Dex (1.25%)		10-12"	78	78	88	65	74	77	0	0	0	5975
Quinclorac (GR)	0.38	10-12"	39	65	73	26	64	84	0	0	0	5162
Molinate (GR)	0.3	10-12"	78	80	87	76	85	89	3	0	0	5729
Quinclorac (DF) +	0.38											
Agri-Dex (1.25%)		14-16"	66	80	84	59	71	68	0	0	0	4159
Quinclorac (GR)	0.38	14-16"	44	54	59	34	50	64	0	0	0	1762
Molinate (GR)	0.5	14-16”	56	79	76	53	84	86	4	9	0	3168
LSD (0.05)			16	14	14	14	15	13	NS	2	NS	865

Table 9. Evaluation of rates and timings of DE-537, Stuttgart, 1998.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft by 16 ft
Row width / Number of rows per plot ..... 6.5 in / 9 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
%OM / pH ..... 1.0 / 5.2

Planting date ..... May 12, 1998
Harvest date ..... September 28, 1998
Crop / Variety ..... Rice / Drew
Dates of Flushing ..... May 14, 21, and June 4, 1998
Date of Flood ..... June 16, 1998

Comments: EPOST = early postemergence; PREFL = preflood.

Application type	EPOST	PREFL
Date applied	May 28, 1998	June 9, 1998
Time	4:00 pm	10:00 am
Incorporation equipment	N/A	N/A
Air / Soil temperature (F)	80 / 80	85 / 82
Relative humidity (%)	90	75
Wind (mph, direction)	1	5
Weather	cloudy	cloudy
Soil moisture	wet	moist
Crop stage / Height	2-3 lf / 6"	4-6 lf - 1 tiller / 8"
Sprayer type / mph	BkPkCO_2 / 3	Hooded BM
Nozzle type / Size	Teejet / XR11002	Teejet / XR11002
Boom ht / # Noz / Spacing (in.)	15 / 3 / 18	15 / 3 / 18
Gpa / Psi	15 / 24	15 / 22
Weed species (density)	---------- (# leaves / height) ----------	
R-ECHCG (20 / ft^2)	2-3 lf / 1.5-2"	5-6 lf- 1 tiller / 4-6"
ECHCG (9 / row ft)	2-3 lf / 2.5-3"	5-6 lf - 1 tiller / 4-6"
LEFFA (12 / ft^2)	N/A	3-6 lf / 2-3"

Conclusions: EPOST treatments of DE-537 at all rates gave good control (>80%) of all weeds present at 28 DAT. Late-season control (56 DAT) required rates ≥0.125 lb / A. Comparison treatments of quinclorac or fenoxaprop also gave good control of weeds at all timings. Preflood treatments of DE-537 did not give adequate control, although there was a trend for greater control with higher rates. Highest yields were obtained with treatments of DE-537 at 0.125 to 0.5 lb / A applied EPOST, fenoxaprop EPOST or EPOST fb PREFL, or AE-F046360-42EC14A.

Table 9. Section 1.

Herbicide	Rate	Application timing	Barnyardgrass control								
			R-ECHCG				ECHCG				
			6/2	6/9	6/18	6/26	6/2	6/9	6/18	6/26	7/21
		(lb/A)	(%)								
Untreated check			0	0	0	0	0	0	0	0	0
DE-537 + Agri-Dex (1.25%)	0.063	EPOST	36	68	76	87	36	81	78	85	45
DE-537 + Agri-Dex (1.25%)	0.125	EPOST	41	89	80	93	41	70	81	90	85
DE-537 + Agri-Dex (1.25%)	0.187	EPOST	35	85	91	97	35	86	93	98	90
DE-537 + Agri-Dex (1.25%)	0.25	EPOST	45	86	94	96	45	92	96	95	95
DE-537 + Agri-Dex (1.25%)	0.5	EPOST	46	95	95	96	46	94	95	97	95
DE-537 + Agri-Dex (1.25%)	0.063	PREFL			50	43			50	38	10
DE-537 + Agri-Dex (1.25%)	0.125	PREFL			38	25			48	28	5
DE-537 + Agri-Dex (1.25%)	0.187	PREFL			53	38			53	45	13
DE-537 + Agri-Dex (1.25%)	0.25	PREFL			53	56			53	51	30
DE-537 + Agri-Dex (1.25%)	0.5	PREFL			63	83			63	86	76
DE-537 + bensulfuron + Agri-Dex (1.25%)	0.187 + 0.038	PREFL			38	33			38	35	18
Propanil	4.0	EPOST	55	45	53	25	55	78	58	60	35
Propanil	4.0	PREFL			35	26			38	33	10
Quinclorac + Agri-Dex (1.25%)	0.375	EPOST	55	90	68	84	55	84	69	86	89
Quinclorac + Agri-Dex (1.25%)	0.5	PREFL			55	83			55	85	84
Fenoxaprop	0.034	EPOST	45	90	95	96	45	89	95	98	91
Fenoxaprop	0.034	PREFL			60	86			63	87	64
Untreated check					0	0			0	0	0
Fenoxaprop fb	0.04	EPOST									
fenoxaprop	0.07	PREFL	43	93	96	98	43	95	97	99	95
AE-F046360-42EC14A fb	0.08	EPOST									
AE-F046360-42EC14A	0.13	PREFL	40	90	93	96	40	89	94	97	90
Propanil fb	4.0	EPOST									
propanil	4.0	PREFL	75	79	58	40	76	82	75	92	41
LSD (0.05)			12	17	11	13	12	19	10	12	12

continued

Table 9. Section 2.

Herbicide	Rate	Application timing	Bearded sprangletop (LEFFA) control 6/26	Bearded sprangletop (LEFFA) control 7/21	Effect on rice Injury 6/2	Injury 6/9	Injury 6/18	Injury 6/26	Yield 9/28
	(lb/A)		(%)						(lb/A)
Untreated check			0	0	0	0	0	0	1497
DE-537 + Agri-Dex (1.25%)	0.063	EPOST	81	91	0	4	0	0	3406
DE-537 + Agri-Dex (1.25%)	0.125	EPOST	91	93	3	5	0	0	6591
DE-537 + Agri-Dex (1.25%)	0.187	EPOST	97	89	0	6	0	0	4954
DE-537 + Agri-Dex (1.25%)	0.25	EPOST	96	95	3	8	0	0	7440
DE-537 + Agri-Dex (1.25%)	0.5	EPOST	97	96	0	4	0	0	6468
DE-537 + Agri-Dex (1.25%)	0.063	PREFL	48	74			5	0	1472
DE-537 + Agri-Dex (1.25%)	0.125	PREFL	30	84			0	0	1425
DE-537 + Agri-Dex (1.25%)	0.187	PREFL	48	54			4	0	1259
DE-537 + Agri-Dex (1.25%)	0.25	PREFL	40	44			4	0	2112
DE-537 + Agri-Dex (1.25%)	0.5	PREFL	78	60			6	0	5049
DE-537 + bensulfuron + Agri-Dex (1.25%)	0.187 + 0.038	PREFL	35	10			1	0	1338
Propanil	4.0	EPOST	63	84	4	6	1	0	2425
Propanil	4.0	PREFL	35	86			3	0	1929
Quinclorac + Agri-Dex (1.25%)	0.375	EPOST	58	30	1	5	0	0	5373
Quinclorac + Agri-Dex (1.25%)	0.5	PREFL	38	20			4	0	5099
Fenoxaprop	0.034	EPOST	96	94	1	14	4	0	5904
Fenoxaprop	0.034	PREFL	83	73			1	0	4096
Untreated check			0	0			0	0	738
Fenoxaprop fb	0.04	EPOST							
fenoxaprop	0.07	PREFL	99	95	3	16	9	0	6509
AE-F046360-42EC14A fb	0.08	EPOST							
AE-F046360-42EC14-A	0.13	PREFL	98	95	1	8	0	0	6414
Propanil fb	4.0	EPOST							
propanil	4.0	PREFL	92	90	6	5	4	0	4419
LSD (0.05)			15	12	4	5	4	NS	926

Table 10. Herbicide evaluation of clomazone (Command) in herbicide programs in Arkansas, Stuttgart, 1998.

TEST INFORMATION

Location	Stuttgart
Experimental Design / replications	RCB / 4
Plot size	6 ft by 16 ft
Row width / Number of rows per plot	6.5 in / 9 rows
Soil type	Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH	1.0 / 5.2
Planting date	May 12, 1998
Harvest date	September 29, 1998
Crop/Variety	Rice / Drew
Dates of Flushing	May 14, 21, and June 4, 1998
Date of Flood	June 16, 1998

Comments: PRE = preemergence; DPRE = delayed preemergence; PREFL = preflood. Emergence of resistant barnyardgrass was poor, and only one rating was taken. A natural infestation of barnyardgrass was rated during the season.

Application type	PRE	DPRE	PREFL
Date applied	May 12, 1998	May 18, 1998	June 9, 1998
Time	10:00 am	12:00 pm	10:00 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	82 / 80	92 / 82	85 / 82
Relative humidity (%)	65	45	75
Wind (mph, direction)	5	4	5
Weather	clear	clear	cloudy
Soil moisture	moist	wet	moist
Crop stage/Height	N/A	spiking / 0.25"	4-6 lf / 8"
Sprayer type/mph	BkPkCO_2 / 3	BkPkCO_2 / 3	Hooded BM
Nozzle type/Size	Teejet / XR11002	Teejet / XR11002	Teejet / XR11002
Boom ht / # Noz / Spacing (in.)	15 / 3 / 18	15 / 3 / 18	15 / 3 / 18
Gpa / Psi	15 / 24	15 / 24	15 / 22
Weed species (density)	----------	(# leaves / height)	----------
R-ECHCG (15/row ft)	N/A	N/A	5-6 lf - 1 tiller / 4-6"
ECHCG (40/ft^2)	N/A	N/A	5-6 lf - 1 tiller / 4-6"
SEBEX (4/row ft)	N/A	N/A	5-6 lf / 6"
AESVI (7/row ft)	N/A	N/A	4-5 lf / 4"
IPOWR (4/row ft)	N/A	N/A	5-8 lf / 3-4"

Conclusions: Clomazone at 0.5 lb/A gave 99% control of barnyardgrass regardless of application timing prior to sequential applications. Herbicide programs involving quinclorac, carfentrazone, and bensulfuron were also effective for control of palmleaf morningglory. Northern jointvetch control was limited to programs of quinclorac and propanil and hemp sesbania control with quinclorac, propanil, or carfentrazone.

Table 10. Section 1.

Herbicide	Rate (lb/A)	Application timing	Weed control: Barnyardgrass (ECHCG) Natural infestation 5/27	6/2	6/11	6/18	7/1	7/20	Barnyardgrass (ECHCG) Susc. 6/11	Barnyardgrass (ECHCG) Resis. 7/1	Palmleaf morningglory (IPOWR) 5/27	6/2	6/11	6/18	7/1	7/20
			(%)													
Untreated check			3	0	0	0	0	0	0	0	0	0	0	0	0	0
Clomazone + quinclorac	0.5 0.38	PRE	99	99	99	99	99	99	99	99	85	84	99	99	99	99
Clomazone + quinclorac	0.2 0.19	PRE	94	99	99	96	99	99	99	99	65	92	94	88	99	99
Clomazone + quinclorac	0.5 0.38	DPRE	91	99	99	99	99	99	99	99	85	99	97	99	99	97
Clomazone + thiobencarb	0.5 4.0	DPRE	94	99	99	99	99	99	99	99	50	55	45	33	20	18
Clomazone + thiobencarb	0.2 2.0	DPRE	95	99	99	99	99	99	99	99	65	61	48	30	43	20
Clomazone + pendimethalin	0.2 1.0	DPRE	95	99	99	99	99	99	99	99	30	74	30	23	20	10
Clomazone + quinclorac	0.2 0.19	DPRE	96	99	99	99	99	99	99	99	80	92	90	78	99	99
Clomazone fb carfentrazone + AG-98 (0.25%)	0.5 0.02	PRE PREFL	91	99	99	99	99	99	99	99	80	97	95	99	99	99
Clomazone fb propanil	0.5 3.0	PRE PREFL	94	99	99	99	98	99	99	99	75	75	69	89	79	70
Clomazone fb propanil	0.2 3.0	PRE PREFL	93	99	99	99	99	98	99	99	35	55	33	46	20	10

continued

Table 10. Section 1. Continued.

			Weed control													
			Barnyardgrass (ECHCG)													
			Natural infestation						Susc.	Resis.	Palmleaf morningglory (IPOWR)					
Herbicide	Rate	Application timing	5/27	6/2	6/11	6/18	7/1	7/20	6/11	7/1	5/27	6/2	6/11	6/18	7/1	7/20
	(lb/A)		(%)													
Clomazone fb bensulfuron + Agri-Dex (1%)	0.2 fb 0.038	PRE PREFL	92	99	99	93	99	99	99	96	70	33	40	25	85	99
Clomazone fb (propanil + molinate) + bensulfuron	0.2 fb 4.5 0.038	PRE PREFL	90	99	98	97	99	99	99	99	55	48	50	52	99	99
Clomazone fb carfentrazone + AG-98 (0.25%)	0.5 fb 0.02	DPRE PREFL	94	99	99	99	99	99	99	99	55	48	50	52	99	99
Clomazone fb propanil	0.5 fb 3.0	DPRE PREFL	90	99	99	99	99	99	99	99	55	75	45	43	48	40
Quinclorac fb propanil	0.38 fb 3.0	DPRE PREFL	95	99	99	99	99	99	99	99	50	87	93	79	99	99
LSD (0.05)			6	1	1	3	1	1	1	2	35	33	22	30	31	22

Table 10. Section 2.

			Weed control										
			Northern jointvetch (AESVI)				Hemp sesbania (SEBEX)						
Herbicide	Rate	Application timing	6/2	6/11	7/1	7/20	5/27	6/2	6/11	6/18	7/1	7/20
	(lb/A)		(%)									
Untreated check			0	0	0	0	0	0	0	0	0	0
Clomazone + quinclorac	0.5 0.38	PRE	99	9	82	83	95	69	99	99	99	99
Clomazone + quinclorac	0.2 0.19	PRE	50	47	20	23	40	99	98	99	99	99

continued

Table 10. Section 2. Continued.

Herbicide	Rate	Application timing	Weed control: Northern jointvetch (AESVI) 6/2	6/11	7/1	7/20	Hemp sesbania (SEBEX) 5/27	6/2	6/11	6/18	7/1	7/20
	(lb/A)		(%)									
Clomazone + quinclorac	0.5 + 0.38	DPRE	98	96	60	96	55	99	98	99	99	99
Clomazone + thiobencarb	0.5 + 4.0	DPRE	96	43	67	63	10	3	17	7	7	0
Clomazone + thiobencarb	0.2 + 2.0	DPRE	55	58	40	52	0	30	23	23	10	0
Clomazone + pendimethalin	0.2 + 1.0	DPRE	17	37	10	3	15	20	17	3	17	0
Clomazone + quinclorac	0.2 + 0.19	DPRE	96	90	81	96	30	91	88	75	94	99
Clomazone fb carfentrazone + AG-98 (0.25%)	0.5 PRE + 0.02	PREFL	43	75	63	48	70	40	85	99	99	99
Clomazone fb propanil	0.5 PRE + 3.0	PREFL	33	47	89	93	10	3	50	99	99	99
Clomazone fb propanil	0.2 PRE + 3.0	PREFL	53	42	99	99	25	23	47	99	99	99
Clomazone fb bensulfuron + Agri-Dex (1%)	0.2 PRE + 0.038	PREFL	40	45	35	25	20	5	20	30	50	55
Clomazone fb (propanil + molinate) + bensulfuron	0.2 PRE + 4.5 + 0.038	PREFL	43	40	91	86	30	0	40	99	99	99
Clomazone fb carfentrazone + AG-98 (0.25%)	0.5 DPRE + 0.02	PREFL	52	80	86	71	30	23	68	99	99	99
Clomazone fb propanil	0.5 DPRE + 3.0	PREFL	71	70	99	94	5	43	50	99	99	99

continued

Table 10. Section 2. Continued.

Herbicide	Rate	Application timing	Weed control: Northern jointvetch (AESVI) 6/2	6/11	7/1	7/20	Hemp sesbania (SEBEX) 5/27	6/2	6/11	6/18	7/1	7/20
	(lb/A)		(%)									
Quinclorac fb propanil	0.38 fb 3.0	DPRE fb PREFL	65	92	99	99	50	98	96	76	99	99
LSD (0.05)			46	26	28	27	42	53	20	25	8	16

Table 10. Section 3.

Herbicide	Rate	Application timing	Effect on rice: Chlorosis 5/27	6/2	6/11	6/18	7/1	7/20	Biomass reduction 6/2	6/11	6/18	7/1	7/20	Yield 9/29
	(lb/A)		(%)											(lb/A)
Untreated check			0	0	0	0	0	0	0	0	0	0	0	1786
Clomazone + quinclorac	0.5 + 0.38	PRE	9	0	0	0	0	0	0	0	1	0	0	8566
Clomazone + quinclorac	0.2 + 0.19	PRE	0	0	0	0	0	0	0	0	0	0	0	8738
Clomazone + quinclorac	0.5 + 0.38	DPRE	8	0	0	0	0	0	0	1	0	0	0	8120
Clomazone + thiobencarb	0.5 + 4.0	DPRE	50	5	5	0	0	0	0	0	0	0	0	7276
Clomazone + thiobencarb	0.2 + 2.0	DPRE	4	0	0	0	0	0	0	0	0	0	0	8028
Clomazone + pendimethalin	0.2 + 1.0	DPRE	0	0	0	0	0	0	0	0	0	0	0	7225
Clomazone + quinclorac	0.2 + 0.19	DPRE	0	0	0	0	0	0	0	0	0	0	0	8259

continued

Table 10. Section 3. Continued.

Herbicide	Rate	Application timing	Effect on rice: Chlorosis 5/27	6/2	6/11	6/18	7/1	7/20	Biomass reduction 6/2	6/11	6/18	7/1	7/20	Yield 9/29
	(lb/A)		(%)											(lb/A)
Clomazone fb carfentrazone + AG-98 (0.25%)	0.5 0.02	PRE PREFL	33	3	2	0	0	0	0	0	0	0	0	8262
Clomazone fb propanil	0.5 3.0	PRE PREFL	13	1	0	0	0	0	0	0	0	0	0	7964
Clomazone fb propanil	0.2 3.0	PRE PREFL	1	0	0	0	0	0	0	0	0	0	0	7829
Clomazone fb bensulfuron + Agri-Dex (1%)	0.2 0.038	PRE PREFL	0	0	0	0	0	0	0	0	0	0	0	8037
Clomazone fb (propanil + molinate) + bensulfuron	0.2 4.5 0.038	PRE PREFL	1	0	1	1	0	0	0	0	0	0	0	8150
Clomazone fb carfentrazone + AG-98 (0.25%)	0.5 0.02	DPRE PREFL	63	6	3	0	0	0	0	1	0	0	0	8535
Clomazone fb propanil	0.5 3.0	DPRE PREFL	68	19	4	0	0	0	11	6	0	0	0	7984
Quinclorac fb propanil	0.38 3.0	DPRE PREFL	0	0	0	0	0	0	0	0	0	0	0	7806
LSD (0.05)			14	4	2	NS	NS	NS	4	2	NS	NS	NS	1352

Table 11. Herbicide evaluation of clomazone (Command) in herbicide programs in Arkansas, Rohwer, 1998.

TEST INFORMATION

Location ..... Rohwer
Experimental Design / replications ..... RCB / 4
Plot size ..... 4.5 ft by 17 ft
Row width / Number of rows per plot ..... 6.5 in / 9 rows
Soil type ..... Sharkey clay (8% sand, 49% silt, 43% clay)
% OM / pH ..... 3.5 / 6.7

Planting date ..... May 7, 1998
Harvest date ..... September 17, 1998
Crop / Variety ..... Rice / Cypress
Dates of Flushing ..... May 12, 18, 21, and June 5, 1998
Date of Flood ..... June 13, 1998

Comments: PRE = preemergence; DPRE = delayed preemergence; PREFL = preflood.

Application type	PRE	DPRE	PREFL
Date applied	May 8, 1998	May 13, 1998	June 9, 1998
Time	12:00 pm	5:00 pm	5:00 pm
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	88/80	92/82	95/100
Relative humidity (%)	43	84	
Wind (mph, direction)	3	5	5
Weather	clear	clear	partly cloudy
Soil moisture	moist	wet	dry
Crop stage/Height	N/A	N/A	5-6 lf - 2 tiller / 7"
Sprayer type/mph	BkPkCO_2 / 3	BkPkCO_2 / 3	Hooded BM
Nozzle type/Size	Teejet / XR11002	Teejet / XR11002	Teejet / TJ11002
Boom ht / # Noz / Spacing (in.)	15/3/18	15/3/18	15/3/18
Gpa / Psi	15/24	15/24	15/24
Weed species (density)	----------	(# leaves / height)	----------
ECHCG (400/ft^2)	N/A	N/A	3-4 lf - 1 tiller / 4"
SEBEX (4/ft^2)	N/A	N/A	5-6 lf / 5-6"
CYPES (1/ft^2)	N/A	2-3 lf / 3-4"	7-10 lf / 5-6"

Conclusions: All programs lacked season-long control of barnyardgrass. This was primarily due to a very high population (>450 plants sq/ft) of barnyardgrass. Even under extreme populations clomazone programs provided 68 to 84% control, except for clomazone PRE fb carfentrazone PREFL (59%).

Table 11. Section 1.

Herbicide	Rate	Application timing	Weed control: Barnyardgrass (ECHCG) 5/26	6/3	6/9	6/17	7/8	Weed control: Hemp sesbania (SEBEX) 6/17
	(lb/A)		(%)					
Untreated check			0	0	0	0	0	0
Clomazone fb carfentrazone	0.5 0.02	PRE PREFL	96	97	94	88	59	100
Clomazone fb propanil	0.5 3.0	PRE PREFL	96	97	96	97	79	100
Clomazone fb carfentrazone	0.5 0.02	DPRE PREFL	97	97	97	89	71	100
Clomazone fb propanil	0.5 3.0	DPRE PREFL	96	98	97	98	84	100
Clomazone + quinclorac	0.5 0.38	PRE	97	98	96	93	71	0
Clomazone + quinclorac	0.5 0.38	DPRE	97	99	99	95	80	50
Clomazone + thiobencarb	0.5 4.0	DPRE	97	98	98	90	68	0
LSD (0.05)			2	2	4	6	10	21

continued

Table 11. Section 2.

Herbicide	Rate	Application timing	Effect on rice: Chlorosis 5/26	6/3	6/9	6/17	7/8	Biomass reduction 6/9	6/17	7/8	Yield 9/17
	(lb/A)		(%)								(lb/A)
Untreated check			0	0	0	0	0	0	0	0	0
Clomazone fb carfentrazone	0.5 0.02	PRE PREFL	0	0	0	0	0	0	0	0	4254

continued

Table 11. Section 2.

Herbicide	Rate	Application timing	Effect on rice: Chlorosis 5/26	Chlorosis 6/3	Chlorosis 6/9	Chlorosis 6/17	Chlorosis 7/8	Biomass reduction 6/9	Biomass reduction 6/17	Biomass reduction 7/8	Yield 9/17
	(lb/A)		(%)								(lb/A)
Clomazone fb propanil	0.5 3.0	PRE PREFL	0	0	0	0	0	0	0	0	6284
Clomazone fb carfentrazone	0.5 0.02	DPRE PREFL	0	0	0	0	0	0	0	0	4229
Clomazone fb propanil	0.5 3.0	DPRE PREFL	5	5	0	0	0	0	0	0	6355
Clomazone + quinclorac	0.5 0.38	PRE	0	0	0	0	0	0	0	0	3133
Clomazone + quinclorac	0.5 0.38	DPRE	0	0	0	0	0	0	0	0	5373
Clomazone + thiobencarb	0.5 4.0	DPRE	0	0	0	0	0	0	0	0	2419
LSD (0.05)			NS	3	NS	NS	NS	NS	NS	NS	2256

Table 12. Imazethapyr control of red rice ecotypes, Stuttgart, 1998.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... Split plot / 4
Plot size ..... 1 row by 10 ft
Row width / Number of rows per plot ..... 7 in / 1 row
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 1.3 / 5.5

Planting date ..... May 21, 1998
Harvest date ..... July 28, 1998
Crop/Variety ..... Red rice / Rice
Date of Flooding ..... June 26, 1998

Comments: Plots not treated with imazethapyr were treated June 3 with 4 lb ai/acre propanil + 0.75 lb ai/acre bentazon and again on June 25 with 4 lb ai/acre propanil to control unwanted weeds.

Application type	POST (imazethapyr)
Date applied	June 12, 1998
Time	8:30 am
Incorporation equipment	N/A
Wind (mph)	15
Weather	clear
Soil moisture	dry
Crop stage/Height	3-4 lf / 5-6"
Sprayer type/mph	BkPkCO_2 / 2
Nozzle type/Size	flat fan / 8001
Boom ht / # Noz / Spacing (in.)	20 / 3 / 20
Gpa / Psi	10 / 23
Weed species	(# leaves/height)
ORYSA	3-4 lf / 5-7"

Conclusions: Most red rice ecotypes produced two to three times the number of tillers per m of row compared to Kaybonnet rice. Nearly all ecotypes were killed with 0.125 lb ai/acre of imazethapyr. However, 1995-8 appears to be slightly more tolerant than other red rice ecotypes. It produced more than four times as much dry weight per m of row as 1995-10 after being sprayed with 0.125 lb ai/acre imazethapyr (the highest rate) and more than 12 times that of the other red rice ecotypes. The highest rate of imazethapyr affected the imazethapyr-tolerant rice only slightly. Mid-July control ratings of all red rice ecotypes except for 1995-8 exceeded 95% after treatment with the 0.063 lb ai/acre rate. Additional research will be required to determine whether 1995-8 is consistently more tolerant than other red rice ecotypes to imazethapyr. Note that in a second test (Table 13) in this publication, the 1995-8 red rice ecotype was not more tolerant than other ecotypes to imazethapyr.

Table 12.

Red rice ecotype / rice cultivar	Imazethapyr rate	Seedling density 6/11	Plant height 6/11	Plant leaf number 6/11	Injury 6/24	Injury 7/14	Tiller density 7/28	Plant height 7/28	Plant dry weight Row 7/28	Plant dry weight Tiller 7/28
	(lb ai/acre)	(no./m row)	(cm)	(no./plant)	----------(%)--------		(no./m row)	(cm)	(g/m row)	(g/tiller)
Red rice ecotypes										
StgS	0	23.7	17.0	3.5	0	0	145	109.90	202.30	1.40
StgS	0.031	15.3	14.5	3.3	50	62	43	74.40	35.70	0.67
StgS	0.063	19.3	15.1	3.2	72	97	6	69.90	5.90	0.67
StgS	0.125	25.0	15.7	3.3	73	88	—	—	0.00	0.00
1995-8	0	39.3	15.7	3.7	0	0	179	114.30	140.90	1.03
1995-8	0.031	32.3	16.3	3.6	48	53	93	66.70	53.00	0.06
1995-8	0.063	34.3	14.8	3.3	63	89	21	60.50	10.60	2.14
1995-8	0.125	33.0	15.4	3.0	67	80	66	64.90	24.40	0.43
1995-10	0	16.3	15.5	3.5	0	0	150	118.10	103.40	0.51
1995-10	0.031	18.0	18.3	3.5	55	72	20	64.80	10.30	0.48
1995-10	0.063	13.7	13.6	3.1	68	98	2	59.20	0.30	0.17
1995-10	0.125	22.0	19.3	3.4	67	83	13	66.50	5.20	0.28
MS4	0	20.0	13.5	2.9	0	0	130	99.60	105.20	0.54
MS4	0.031	23.7	12.8	3.3	60	83	20	52.80	7.90	0.36
MS4	0.063	17.0	12.6	2.9	75	96	5	40.60	0.20	0.05
MS4	0.125	20.3	16.4	3.1	75	97	9	50.70	0.80	0.09
StgB	0	17.0	17.5	3.7	0	0	130	90.80	81.40	0.65
StgB	0.031	20.3	17.3	3.6	58	68	39	61.90	18.70	0.38
StgB	0.063	15.3	18.2	3.6	65	98	7	59.90	2.10	0.24
StgB	0.125	17.7	17.0	3.5	71	100	—	—	0.00	0.00
TX4	0	9.0	15.6	3.5	0	0	121	112.80	116.40	0.68
TX4	0.031	15.7	16.3	3.2	70	86	29	69.20	3.30	0.11
TX4	0.063	7.0	16.7	3.0	67	98	2	50.70	0.40	0.22
TX4	0.125	6.7	17.9	3.4	74	100	—	—	0.00	0.00
Katy-red rice hybrid	0	16.3	13.2	3.3	0	0	167	78.80	150.20	0.61
Katy-red rice hybrid	0.031	33.7	13.5	3.3	57	90	7	56.20	2.10	0.26

continued

Table 12. Continued.

Red rice ecotype/ rice cultivar	Imazethapyr rate	Seedling density 6/11	Plant height 6/11	Plant leaf number 6/11	Injury 6/24	Injury 7/14	Tiller density 7/28	Plant height 7/28	Plant dry weight Row 7/28	Plant dry weight Tiller 7/28
	(lb ai/acre)	(no./mrow)	(cm)	(no./plant)	---------(%)---------		(no./mrow)	(cm)	(g/mrow)	(g/tiller)
Red rice ecotypes (continued)										
Katy-red rice hybrid	0.063	19.7	13.0	3.3	72	100	55	61.20	6.50	0.12
Katy-red rice hybrid	0.125	28.0	14.1	3.3	78	97	11	57.20	1.90	0.18
Rice cultivars										
IMI-tolerant	0	18.7	14.2	3.0	0	0	104	82.00	152.90	1.47
IMI-tolerant	0.031	28.0	12.9	3.3	7	18	127	76.50	162.20	1.25
IMI-tolerant	0.063	21.0	14.9	3.0	10	18	127	80.00	192.90	1.50
IMI-tolerant	0.125	22.0	13.6	3.1	13	22	109	76.60	138.40	1.27
Kaybonnet	0	20.3	13.9	3.0	0	0	55	75.00	33.70	0.62
Kaybonnet	0.031	29.3	13.0	3.1	63	80	34	67.10	10.10	0.91
Kaybonnet	0.063	26.7	13.1	2.8	78	95	13	67.50	3.30	0.25
Kaybonnet	0.125	24.7	13.1	3.1	83	93	2	51.20	0.20	0.12
LSD (0.05)		NS	NS	NS	16	17	NS	NS	41.00	NS

Table 13. Rice ecotype response to imazethapyr, Stuttgart, 1998.

TEST INFORMATION

Location	Stuttgart
Experimental Design / replications	RCB / 3
Plot size	2 ft by 6 ft
Row width / Number of rows per plot	2 ft / 1 row
Soil type	Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH	1.3 / 5.5
Planting date	May 21, 1998
Harvest date	September 11, 1998
Crop/Variety	Red rice / Rice
Date of Flooding	June 26, 1998

Comments: Plots not treated with imazethapyr were treated June 3 with 4 lb ai/acre propanil + 0.75 lb ai/acre bentazon and again on June 25 with 4 lb ai/acre propanil to control unwanted weeds.

Application type	POST (imazethapyr)
Date applied	June 12, 1998
Time	8:30 am
Incorporation equipment	N/A
Wind (mph)	15
Weather	clear
Soil moisture	dry
Crop stage/Height	3-4 lf / 5-6"
Sprayer type/mph	BkPkCO_2 / 2
Nozzle type/Size	flat fan / 8001
Boom ht / # Noz / Spacing (in.)	20 / 3 / 20
Gpa / Psi	10 / 23
Weed species	(# leaves/height)
ORYSA	3-4 lf / 5-8"

Conclusions: At mid-July rating, the most tolerant red rice ecotypes to 0.063 lb ai/acre imazethapyr appeared to be the blackhull types 10A and 1995-4 and the strawhull type 13H, all at 85% control. Control of most other ecotypes exceeded 95%. Control of StgS and StgB, the local standard red rice ecotypes, was 100%.

Table 13.

Ecotype	Visual ratings June 24	Visual ratings July 14
	--------- (% control) ---------	
Blackhull types		
StgB	62	100
10A	58	85
17C	63	95
18E	63	88
1995-1	63	100
1995-10	62	100
1995-13	70	100
1995-4	68	85
1995-8	68	96
1995-9	62	99
1996-11	70	98
1997-1	70	100
1997-27	—	—
19A	62	96
8	62	100
TX4	57	93
Strawhull types		
StgS	63	100
11A	67	100
11B	65	100
11C	72	98
11D	67	100
13G	58	96
13H	68	85
15A	65	100
16B	63	97
16E	63	100
Strawhull types - continued		
17A	62	100
1995-2	63	96
1995-3	62	93
1995-5	65	93
1995-6	65	98
1995-7	60	100
Katy-red rice hybrid	63	97
1996-10	58	95
1997-3	65	98
1997-22	70	98
1997-23	68	100
1997-24	67	97
1997-25	68	99
1997-26	62	92
1997-28	67	100
20A	68	95
21A	67	99
2B	67	100
3B	70	100
4A	60	97
7	63	96
LA3	67	92
MS4	68	98
White types		
KBNT	73	95
PI414714	75	100
$LSD_{(0.05)}$	6	8

Table 14. Reduced propanil rate for barnyardgrass control in rice, Stuttgart, 1998.

TEST INFORMATION

Location	Stuttgart
Experimental Design / replications	Split plot / 4
Plot size	5.25 ft by 10 ft
Row width / Number of rows per plot	7 in / 9 rows
Soil type	Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH	1.3 / 5.5
Planting date	May 12, 1998
Harvest date	September 24, 1998
Crop/Variety	Rice / Kaybonnet / Lemont / PI312777
Dates of Flushing	May 21 and June 4, 1998
Date of Flooding	June 17, 1998

Comments: The whole area was treated with 1.0 lb/acre bentazon + 0.5% v/v Agri-Dex on June 12, 1998. POST = postemergence.

Application type	POST
Date applied	June 10, 1998
Time	N/A
Incorporation equipment	N/A
Air temperature (F)	80
Wind (mph)	15
Weather	mostly cloudy
Soil moisture	N/A
Crop stage/Height	3-5 lf / 7-11"
Sprayer type/mph	Bk Pk CO_2 / 2
Nozzle type/Size	flat fan / 8001
Boom ht / # Noz / Spacing (in.)	20 / 3 / 20
Gpa / Psi	10 / 23
Weed species	--- (# leaves/height) ---
ECHCG	2-3 lf / 0.5-2"

Conclusions: With a naturally suppressive rice cultivar such as PI312777, propanil rates as low as 1 lb/acre resulted in adequate early season barnyardgrass control and lasted until harvest. Propanil rates of 2 to 5 lb/acre provided good to excellent barnyardgrass control in Kaybonnet and Lemont cultivars. Without propanil application, PI312777 had the highest grain yield.

Table 14.

Cultivar	Propanil rate	Barnyardgrass (ECHCG) Control 6/16/98	Control 7/7/98	Dry weight at harvest	Rice yield
	(lb/acre)	(%)		(lb/acre)	
Kaybonnet	0	0	0	1437	6093
	1	50	68	327	6683
	2	84	86	231	7119
	3	92	91	234	7034
	5	98	94	0	7076
Lemont	0	0	0	1245	5494
	1	62	81	299	6512
	2	82	86	560	6145
	3	91	96	61	6561
	5	90	92	0	6356
PI312777	0	62	72	104	7394
	1	75	80	165	7492
	2	92	97	17	7297
	3	95	99	0	7480
	5	95	96	0	7239
No rice	0	0	0	5311	—
	1	72	79	166	—
	2	90	98	49	—
	3	95	99	93	—
	5	100	86	0	—
LSD (0.05) two cultivars at same or different propanil rate		11	18	644	NS

Table 15. Influence of flooding on the performance of herbicides and growth of rice and red rice, Stuttgart, 1998.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... Split plot / 4
Plot size ..... 6.6 ft by 10 ft
Row width / Number of rows per plot .....
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 1.3 / 5.5
Planting date - red rice ..... May 19, 1998
Domestic rice ..... May 22, 1998
Harvest date ..... October 2, 1998
Crop/Variety ..... Rice / Kaybonnet
Date of Flooding ..... May 20, 1998
Date of draining pinpoint flood ..... May 27, 1998

Comments: Plots were tilled with a Triple-K before planting. Red rice seeds were broadcast seeded at 48 lb/acre. Kaybonnet domestic rice at 89 lb/acre was soaked for 24 h and kept drained for 24 h before broadcast seeding. Domestic rice yield was adjusted to 12% moisture content. PPI - preplant incorporated; PPL - preplant; DAS - days after sowing.

Application type	PPI	PPL
Date applied	May 19, 1998	May 19, 1998
Time	10:30 am	11:30 am
Incorporation equipment	Rototiller	N/A
Air temperature (F)	85	85
Wind (mph)	15	5
Weather	mostly sunny	sunny
Soil moisture	dry	dry
Crop stage/Height		
Sprayer type/mph	BkPkCO_2 / 2	BkPkCO_2 / 2
Nozzle type/Size	flat fan / 8001	flat fan / 8001
Boom ht / # Noz / Spacing (in.)	20 / 3 / 20	20 / 3 / 20
Gpa / Psi	10 / 23	10 / 25

Conclusions: This study was conducted to evaluate the influence of flooding on the effect of molinate (Ordram) and thiobencarb (Bolero) to domestic rice and red rice. Thiobencarb was phytotoxic to domestic rice in continuous flooding but not in pinpoint flooding. Molinate was effective on red rice and relatively safe on rice in both flooding regimes. Herbicide effect was not different between the two red rice ecotypes. When left in competition with Kaybonnet, Stuttgart strawhull and blackhull red rice ecotypes reduced yield of domestic rice by 63% in continuous flooding and 92% in pinpoint flooding.

Table 15.

Cultivar	Rate (lb/acre)	Application type	Red rice Control 62 DAS (%)	Red rice Panicle density (no./ft²)	Domestic rice Injury 62 DAS (%)	Domestic rice Panicle density (no./ft²)	Yield (lb/acre)
Continuous flood:							
Molinate / no red rice	4.0	PPI			0	42	7000
Molinate / strawhullRR	4.0	PPI	87	3	0	35	5900
Molinate / blackhullRR	4.0	PPI	85	2	0	44	5100
Thiobencarb / no red rice	4.0	PPL			77	28	3800
Thiobencrab / strawhullRR	4.0	PPL	84	1	89	22	2900
Thiobencarb / blackhullRR	4.0	PPL	80	2	82	20	3600
Untreated / no red rice					0	46	7100
Untreated / strawhullRR			12	11	0	23	2800
Untreated / blackhullRR			15	15	0	18	2500
Pinpoint flood:							
Molinate / no red rice	4.0	PPI			0	51	5800
Molinate / strawhullRR	4.0	PPI	82	7	0	32	5000
Molinate / blackhullRR	4.0	PPI	81	7	0	34	5000
Thiobencarb / no red rice	4.0	PPL			7	45	6900
Thiobencrab / strawhullRR	4.0	PPL	80	10	2	31	2400
Thiobencarb / blackhullRR	4.0	PPL	80	4	0	29	3300
Untreated / no red rice					0	40	6900
Untreated / strawhullRR			0	26	0	10	700
Untreated / blackhullRR			0	19	0	8	400
LSD(0.05)			8	5	12	11	1800

Table 16. Propanil synergists, Lonoke, 1998.

TEST INFORMATION

Location ..... Lonoke
Experimental Design / replications ..... RCB / 4
Plot size ..... 10 ft by 20 ft
Row width / Number of rows per plot ..... 7.5 in / 9 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.9 / 5.2

Planting date ..... May 11, 1998
Harvest date ..... September 6, 1998
Crop/Variety ..... Rice/Drew
Dates of Flushing ..... May 9, 16, and 21, 1998
Date of Flooding ..... June 15, 1998

Comments: EPOST = early postemergence; and LPOST = late postemergence.

Application type	EPOST	LPOST
Date applied	May 27, 1998	June 3, 1998
Time	5:00 pm	8:00 pm
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	85 / 90	85 / 82
Relative humidity (%)	75	75
Wind (mph)	3	3
Weather	mostly cloudy	clear
Soil moisture	wet	normal
Crop stage/Height	3-4 lf / 6"	5-6 lf / 8"
Sprayer type/mph	BkPkCO_2 / 3	BkPkCO_2 / 3
Nozzle type/Size	Teejet / XR11002	Teejet / XR11002
Boom ht / # Noz / Spacing (in.)	20 / 6 / 20	22 / 6 / 20
Gpa / Psi	15 / 35	15 / 33
Weed species (density)	---------- (# leaves/height) ----------	
R-ECHCG (15/row ft)	2-3 lf / 2"	4-5 lf / 3.5"
ECHCG (30/row ft)	2-3 lf / 2"	4-5 lf / 3.5"
BRAPP (35/ft^2)	4-5 lf / 3.5"	2 tiller / 5"

Conclusions: All treatments except propanil alone gave ≥97% control of resistant barnyardgrass. The highest yield was obtained with the sequential treatment of (propanil + molinate), although most other treatment yields were not significantly different from this. Combinations including anilophos or piperophos with quinclorac yielded significantly better than propanil + quinclorac alone. Although injury from piperophos and carbaryl was lower than in 1997 because rates were reduced, injury from sequential applications persisted until 56 DAT.

Table 16. Section 1.

Herbicide	Rate	Application timing	Weed control: Barnyardgrass: Resistant (R-ECHCG) 6/2	6/9	6/24	7/22	Susceptible (ECHCG) 6/2	6/9	6/24	7/22
	(lb/A)		(%)							
Untreated control			0	0	0	0	0	0	0	0
Propanil	3.0	EPOST	43	50	58	58	53	63	92	94
Propanil + anilophos	3.0 0.5	EPOST	90	91	94	99	95	95	98	97
Propanil + piperophos	3.0 0.375	EPOST	91	97	98	98	97	98	98	96
Propanil + carbaryl	3.0 0.03	EPOST	90	93	98	98	96	98	98	92
(Propanil + molinate)	4.5	EPOST	93	96	97	99	90	96	98	97
Propanil fb propanil	3.0 3.0	EPOST LPOST	95	96	97	99	97	98	94	97
Propanil + anilophos fb propanil + anilophos	3.0 0.5 3.0 0.5	EPOST LPOST	93	94	98	99	90	97	98	98
Propanil + piperophos fb propanil + thiobencarb	3.0 0.375 3.0 0.375	EPOST LPOST	87	94	98	99	94	96	98	98

continued

Table 16. Section 1.

Herbicide	Rate	Application timing	Weed control: Barnyardgrass: Resistant (R-ECHCG) 6/2	6/9	6/24	7/22	Susceptible (ECHCG) 6/2	6/9	6/24	7/22
	(lb/A)		(%)							
Propanil + carbaryl fb	3.0 0.03	EPOST								
propanil + carbaryl	3.0 0.03	LPOST	96	98	98	99	96	98	98	99
(Propanil + molinate) fb	4.5	EPOST								
(propanil + molinate)	4.5	LPOST	92	98	98	98	94	98	98	98
Propanil + anilophos + thiobencarb	3.0 0.3 3.0	EPOST	96	96	98	98	97	97	98	99
Propanil + anilophos + quinclorac	3.0 0.5 0.375	EPOST	99	98	98	99	100	98	98	99
Propanil + anilophos + pendimethalin	3.0 0.3 1.0	EPOST	93	96	97	97	94	94	98	95
Propanil + piperophos + thiobencarb	3.0 0.375 3.0	EPOST	94	96	98	98	98	98	98	98
Propanil + piperophos + quinclorac	3.0 0.375 0.375	EPOST	100	98	98	99	100	98	98	99
Propanil + piperophos + pendimethalin	3.0 0.375 1.0	EPOST	98	99	98	96	97	99	98	97
Propanil + carbaryl + thiobencarb	3.0 0.03 3.0	EPOST	100	99	98	97	100	99	98	96

continued

Table 16. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control: Barnyardgrass: Resistant (R-ECHCG) 6/2	6/9	6/24	7/22	Susceptible (ECHCG) 6/2	6/9	6/24	7/22
	(lb/A)		(%)							
Propanil + carbaryl + quinclorac	3.0 + 0.03 + 0.375	EPOST	100	98	98	98	100	98	98	98
Propanil + carbaryl + pendimethalin	3.0 + 0.03 + 1.0	EPOST	87	93	98	98	94	96	98	88
(Propanil + molinate) + thiobencarb	4.5 + 3.0	EPOST	91	98	98	97	93	98	98	97
(Propanil + molinate) + quinclorac	4.5 + 0.375	EPOST	96	95	98	99	100	96	98	99
(Propanil + molinate) + pendimethalin	4.5 + 1.0	EPOST	95	98	98	98	94	98	98	94
Propanil + thiobencarb	4.5 + 3.0	EPOST	91	93	98	98	95	97	98	98
Propanil + quinclorac	3.0 + 0.375	EPOST	98	98	98	98	100	98	98	98
Propanil + pendimethalin	3.0 + 1.0	EPOST	91	92	96	96	92	94	97	97
LSD (0.05)			6	6	2	3	7	4	3	6

continued

Table 16. Section 2.

Herbicide	Rate	Application timing	Weed control Broadleaf signalgrass (BRAPP) 6/2	6/9	6/24	7/22	Rice injury 6/2	6/9	6/24	7/22	Rice yield 9/6
	(lb/A)		(%)				(%)				(lb/A)
Untreated control			0	0	0	0	0	0	0	0	2497
Propanil	3.0	EPOST	68	68	67	70	0	0	0	0	5827
Propanil + anilophos	3.0 0.5	EPOST	88	90	87	88	5	2	0	2	5324
Propanil + piperophos	3.0 0.375	EPOST	78	76	78	81	2	0	0	0	5343
Propanil + carbaryl	3.0 0.03	EPOST	81	91	90	90	29	14	5	1	5612
(Propanil + molinate)	4.5	EPOST	86	91	91	91	1	0	0	2	5692
Propanil fb propanil	3.0 3.0	EPOST LPOST	95	96	94	93	3	2	0	2	6079
Propanil + anilophos fb propanil + anilophos	3.0 0.5 3.0 0.5	EPOST LPOST	95	94	94	96	30	25	22	12	4927
Propanil + piperophos fb propanil + thiobencarb	3.0 0.375 3.0 0.375	EPOST LPOST	91	95	97	99	2	22	19	15	5082
Propanil + carbaryl fb propanil + carbaryl	3.0 0.03 3.0 0.03	EPOST LPOST	92	98	98	99	38	38	22	19	4835
(Propanil + molinate) fb (propanil + molinate)	4.5 4.5	EPOST LPOST	82	98	96	97	4	5	5	6	6113
Propanil + anilophos + thiobencarb	3.0 0.3 3.0	EPOST	84	94	91	92	9	1	2	2	5445

continued

Table 16. Section 2. Continued.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 6/2	6/9	6/24	7/22	Rice injury 6/2	6/9	6/24	7/22	Yield 9/6
	(lb/A)		(%)								(lb/A)
Propanil + anilophos + quinclorac	3.0 + 0.5 + 0.375	EPOST	96	98	98	98	5	2	2	5	5496
Propanil + anilophos + pendimethalin	3.0 + 0.3 + 1.0	EPOST	90	89	92	92	4	2	0	2	5336
Propanil + piperophos + thiobencarb	3.0 + 0.375 + 3.0	EPOST	91	97	96	96	9	1	2	4	5489
Propanil + piperophos + quinclorac	3.0 + 0.375 + 0.375	EPOST	95	98	97	97	2	2	2	6	5561
Propanil + piperophos + pendimethalin	3.0 + 0.375 + 1.0	EPOST	94	98	96	97	4	4	2	5	5626
Propanil + carbaryl + thiobencarb	3.0 + 0.03 + 3.0	EPOST	94	98	94	94	25	14	2	2	5380
Propanil + carbaryl + quinclorac	3.0 + 0.03 + 0.375	EPOST	96	98	97	98	35	14	15	10	5002
Propanil + carbaryl + pendimethalin	3.0 + 0.03 + 1.0	EPOST	91	96	94	92	36	14	8	5	5532
(Propanil + molinate) + thiobencarb	4.5 + 3.0	EPOST	84	91	92	92	4	1	0	0	5525
(Propanil + molinate) + quinclorac	4.5 + 0.375	EPOST	86	95	96	97	4	0	0	1	5597
(Propanil + molinate) + pendimethalin	4.5 + 1.0	EPOST	75	86	90	86	4	0	0	1	5699

continued

Table 16. Section 2. Continued.

Herbicide	Rate	Application timing	Weed control Broadleaf signalgrass (BRAPP) 6/2	6/9	6/24	7/22	Rice injury 6/2	6/9	6/24	7/22	Yield 9/6
	(lb/A)		(%)								(lb/A)
Propanil + thiobencarb	4.5 3.0	EPOST	86	88	86	88	9	5	0	1	5568
Propanil + quinclorac	3.0 0.375	EPOST	95	98	95	95	2	1	1	1	5402
Propanil + pendimethalin	3.0 1.0	EPOST	80	81	85	88	2	1	1	0	5634
LSD (0.05)			8	6	6	7	6	5	5	5	622

Table 17. Propanil synergists, Stuttgart, 1998.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft by 16 ft
Row width / Number of rows per plot ..... 6.5 in / 9 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.9 / 5.2

Planting date ..... May 12, 1998
Harvest date ..... September 28, 1998
Crop/Variety ..... Rice/Drew
Dates of Flushing ..... May 14, 21, and June 4, 1998
Date of Flooding ..... June 16, 1998

Comments: EPOST = early postemergence; and LPOST = late postemergence.

Application type	EPOST	LPOST
Date applied	May 28, 1998	June 9, 1998
Time	4:00 pm	11:00 am
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	80/80	85/82
Relative humidity (%)	90	75
Wind (mph)	1	5
Weather	cloudy	cloudy
Soil moisture	moist	moist
Crop stage/Height	2-3 lf / 6"	4-6 lf / 8"
Sprayer type/mph	BkPkCO_2 / 3	Hooded BM / 3
Nozzle type/Size	Teejet / XR1 1002	Teejet / XR11002
Boom ht / # Noz / Spacing (in.)	15/3/18	15/3/18
Gpa / Psi	15/24	15/22
Weed species (density)	---------- (# leaves/height) ----------	
R-ECHCG (15/row ft)	2-3 lf / 1-1.5"	5-6 lf / 4-6"
ECHCG (12/row ft)	2-3 lf / 1"	5-6 lf / 4-6"
LEFPA (N/A)	N/A	N/A

Conclusions: All treatments except propanil alone gave good control (≥90%) of resistant barnyardgrass at 56 DAT. Single and sequential applications of propanil + carbaryl at 0.03 lb/A gave 44 and 45% injury at 7 DAT, respectively, and significantly reduced yields. However, treatment of propanil with 0.005 lb/A carbaryl, anilophos, or piperophos resulted in high yields (>7300 lb/A).

Table 17. Section 1.

Herbicide	Rate	Application timing	Barnyardgrass control							
			Resistant (R-ECHCG)				Susceptible (ECHCG)			
			6/3	6/8	6/23	7/22	6/3	6/8	6/23	7/22
	(lb/A)		(%)							
Untreated control			0	0	0	0	0	0	0	0
Propanil	4.0	EPOST	94	98	66	64	96	84	85	82
Propanil +	4.0									
anilophos	0.25	EPOST	100	96	92	94	100	97	95	92
Propanil +	4.0									
piperophos	0.375	EPOST	99	94	94	95	99	97	94	97
Propanil +	4.0									
carbaryl	0.03	EPOST	100	91	94	92	100	95	95	87
Propanil (80 EDF) +	4.0									
carbaryl +	0.005									
Agri-Dex (1%)		EPOST	98	84	91	92	99	94	95	90
Propanil (Super Wham) +	4.0									
Agri-Dex (1%)		EPOST	98	86	89	90	98	88	90	75
Propanil +	4.0									
thiobencarb	3.0	EPOST	99	95	93	94	100	96	96	94
Propanil +	4.0									
quinclorac	0.25	EPOST	99	93	92	93	100	95	95	98
Propanil +	4.0									
pendimethalin	1.0	EPOST	98	88	95	94	98	92	95	94
(Propanil + molinate)	6.0	EPOST	98	85	91	93	98	90	94	85
Propanil fb	3.0	EPOST								
propanil	3.0	LPOST	91	85	86	90	93	90	92	82
Propanil +	3.0									
anilophos fb	0.25	EPOST								
propanil +	3.0									
anilophos	0.25	LPOST	96	88	92	92	98	90	95	95

continued

Table 17. Section 1. Continued.

Herbicide	Rate	Application timing	Barnyardgrass control							
			Resistant (R-ECHCG)				Susceptible (ECHCG)			
			6/3	6/8	6/23	7/22	6/3	6/8	6/23	7/22
	(lb/A)		(%)							
Propanil +	3.0									
piperophos fb	0.375	EPOST								
propanil +	3.0									
piperophos	0.375	LPOST	96	94	94	96	97	93	94	96
Propanil +	3.0									
carbaryl fb	0.023	EPOST								
propanil +	3.0									
carbaryl	0.023	LPOST	100	91	95	94	100	88	95	94
Propanil (80 EDF) +	3.0									
carbaryl +	0.004									
Agri-Dex (1%)		EPOST								
propanil (80 EDF) +	3.0									
carbaryl +	0.004									
Agri-Dex (1%)		LPOST	99	89	94	92	99	90	94	95
Propanil (Super Wham) +	3.0									
Agri-Dex (1%) fb		EPOST								
propanil (Super Wham) +	3.0									
Agri-Dex (1%)		LPOST	98	91	92	94	99	88	94	90
Propanil (80 EDF) +	4.0									
quinclorac +	0.25									
Agri-Dex (1%)		EPOST	98	94	91	92	99	96	94	99
Propanil (80 EDF) +	4.0									
thiobencarb +	3.0									
Agri-Dex (1%)		EPOST	96	90	90	90	97	89	90	86
Propanil (80 EDF) +	4.0									
pendimethalin +	1.0									
Agri-Dex (1%)		EPOST	96	93	92	93	98	95	94	90

continued

Table 17. Section 1. Continued.

Herbicide	Rate	Application timing	Barnyardgrass control							
			Resistant (R-ECHCG)				Susceptible (ECHCG)			
			6/3	6/8	6/23	7/22	6/3	6/8	6/23	7/22
	(lb/A)		(%)							
Propanil (80 EDF) + clomazone + Agri-Dex (1%)	4.0 0.2	EPOST	97	93	90	95	98	97	94	94
LSD (0.05)			3	6	6	5	3	4	4	10

continued

Table 17. Section 2.

Herbicide	Rate	Application timing	Amazon sprangletop (LEFPA) control		Rice injury				Rice yield
			6/23	7/22	6/3	6/8	6/23	7/22	9/28
	(lb/A)		(%)						(lb/A)
Untreated control			0	0	0	0	0	0	2196
Propanil	4.0	EPOST	65	89	8	8	0	0	6748
Propanil + anilophos	4.0 0.25	EPOST	76	75	16	18	1	2	7466
Propanil + piperophos	4.0 0.375	EPOST	78	79	15	12	0	0	8919
Propanil + carbaryl	4.0 0.03	EPOST	72	59	44	29	4	2	6358
Propanil (80 EDF) + carbaryl + Agri-Dex (1%)	4.0 0.005	EPOST	71	78	11	8	0	2	8309

continued

Table 17. Section 2. Continued.

Herbicide	Rate	Application timing	Amazon sprangletop (LEFPA) control		Rice injury				Rice yield
			6/23	7/22	6/3	6/8	6/23	7/22	9/28
	(lb/A)		----------(%)----------						(lb/A)
Propanil (Super Wham) +	4.0								
Agri-Dex (1%)		EPOST	62	51	16	11	0	1	7089
Propanil +	4.0								
thiobencarb	3.0	EPOST	82	91	24	16	0	4	6971
Propanil +	4.0								
quinclorac	0.25	EPOST	81	86	8	8	0	2	6818
Propanil +	4.0								
pendimethalin	1.0	EPOST	81	91	15	11	0	4	7998
(Propanil + molinate)	6.0	EPOST	74	85	4	5	0	4	7334
Propanil fb	3.0	EPOST							
propanil	3.0	LPOST	62	75	9	8	0	4	7350
Propanil +	3.0								
anilophos fb	0.25	EPOST							
propanil +	3.0								
anilophos	0.25	LPOST	78	80	15	10	0	4	7316
Propanil +	3.0								
piperophos fb	0.375	EPOST							
propanil +	3.0								
piperophos	0.375	LPOST	76	70	12	11	2	2	7380
Propanil +	3.0								
carbaryl fb	0.023	EPOST							
propanil +	3.0								
carbaryl	0.023	LPOST	71	10	45	22	11	5	3259
Propanil (80 EDF) +	3.0								
carbaryl +	0.004								
Agri-Dex (1%)		EPOST							
propanil (80 EDF) +	3.0								
carbaryl +	0.004								
Agri-Dex (1%)		LPOST	78	61	15	10	1	4	7416

continued

Table 17. Section 2. Continued.

Herbicide	Rate	Application timing	Amazon sprangletop (LEFPA) control 6/23	Amazon sprangletop (LEFPA) control 7/22	Rice injury 6/3	Rice injury 6/8	Rice injury 6/23	Rice injury 7/22	Rice yield 9/28
	(lb/A)		(%)						(lb/A)
Propanil (Super Wham) + Agri-Dex (1%) fb	3.0	EPOST							
propanil (Super Wham) + Agri-Dex (1%)	3.0	LPOST	76	71	8	8	1	6	7095
Propanil (80 EDF) + quinclorac + Agri-Dex (1%)	4.0 + 0.25	EPOST	71	58	1	5	0	0	7450
Propanil (80 EDF) + thiobencarb + Agri-Dex (1%)	4.0 + 3.0	EPOST	75	93	8	9	0	0	7386
Propanil (80 EDF) + pendimethalin + Agri-Dex (1%)	4.0 + 1.0	EPOST	81	90	4	4	0	1	8460
Propanil (80 EDF) + clomazone + Agri-Dex (1%)	4.0 + 0.2	EPOST	88	99	1	5	0	1	7282
LSD (0.05)			8	13	7	5	2	NS	1658

Table 18. Fenoxaprop (Whip) safener effect on rice, Lonoke, 1998.

TEST INFORMATION

Location ..... Lonoke
Experimental Design / replications ..... RCB / 4
Plot size ..... 10 ft by 20 ft
Row width / Number of rows per plot ..... 7 in / 9 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.9 / 4.3

Planting date ..... May 2, 1998
Harvest date ..... September 4, 1998
Crop/Variety ..... Rice/Bengal
Dates of Flushing ..... May 7, 14, and 20, 1998
Date of Flooding ..... June 2, 1998

Comments: Entire study was sprayed with quinclorac (Facet) to remove weed competition to allow rice injury and yield to be the only objective of the study. Preplant N was applied to study, and rice was kept actively growing by flushing prior to treatments. DPRE = delayed preplant; 2-3 lf = 2-3 leaf rice; and PREFL = preflood. AEF046360 = fenoxaprop + safener.

Application type	DPRE	2-3lf	PREFL
Date applied	May 5, 1998	May 19, 1998	June 2, 1998
Time	9:35 am	1:20 pm	6:30 pm
Incorporation equipment	Triple-K	N/A	N/A
Air/Soil temperature (F)	76/68	99/84	96/98
Relative humidity (%)	56	41	46
Wind (mph)	2	3	6
Weather	mostly cloudy	clear	clear
Soil moisture	moist	moist	dry
Crop stage/Height	N/A	3lf / 4.5"	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.)	18/6/20	20/6/20	25/6/20
Gpa / Psi	10/21	10/20	10/19

Conclusions: The high rates of AEF04630 (safened fenoxaprop) applied twice resulted in no injury and yields equivalent to the propanil (Super Wham) standard. The standard formulation of fenoxaprop (Whip) applied at the same rate (0.193 lb ai/acre) as AEF04630 resulted in severe injury and yield loss. The new fenoxaprop formulation appears very promising.

Table 18.

Herbicide	Rate	Application timing	Effect on rice: Injury 5/15	5/29	6/16	7/2	7/27	8/27	Yield
	(lb/A)		(%)						(lb/A)
Quinclorac fb	0.25	DPRE							
propanil (Super Wham) +	4.0								
Penetrator Plus (1 pt/A) fb		2-3lf							
propanil (Super Wham) +	4.0								
Penetrator Plus (1 pt/A)		PREFL	0	0	0	0	1	0	8550
Quinclorac fb	0.25	DPRE							
fenoxaprop fb	0.04	2-3lf							
fenoxaprop	0.067	PREFL	0	28	25	15	15	0	6570
Quinclorac fb	0.25	DPRE							
AEF046360 fb	0.08	2-3lf							
AEF046360	0.133	PREFL	0	0	0	0	0	0	8640
Quinclorac fb	0.25	DPRE							
propanil (Super Wham) +	4.0								
Penetrator Plus (1 pt/A) fb		2-3lf							
fenoxaprop	0.067	PREFL	0	0	1	0	9	0	7515
Quinclorac fb	0.25	DPRE							
propanil (Super Wham) +	4.0								
Penetrator Plus (1 pt/A) fb		2-3lf							
AEF046360	0.133	PREFL	0	0	0	0	0	0	8415
Quinclorac fb	0.25	DPRE							
fenoxaprop fb	0.08	2-3lf							
fenoxaprop	0.133	PREFL	0	50	91	85	66	30	2745
Quinclorac fb	0.25	DPRE							
AEF046360 fb	0.16	2-3lf							
AEF046360	0.27	PREFL	0	3	0	0	0	0	8370
LSD (0.05)			NS	4	17	17	12	12	900

Table 19. Broadleaf weed control in rice, Lonoke, 1998.

TEST INFORMATION

Location ..... Lonoke
Experimental Design / replications ..... RCB / 4
Plot size ..... 10 ft by 20 ft
Row width / Number of rows per plot ..... 7.5 in / 14 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.9 / 4.3

Planting date ..... May 2, 1998
Harvest date ..... September 5, 1998
Crop/Variety ..... Rice/Drew
Dates of Flushing ..... May 7, 14, and 20, 1998
Date of Flooding ..... June 2, 1998

Comments: 2-3 lf = 2-3 leaf rice; 4 lf = 4 leaf rice; PREFL = preflood; and PI = panicle initiation.

Application type	2-3 lf	4 lf	PREFL	PI
Date applied	May 20, 1998	May 27, 1998	June 1, 1998	June 22, 1998
Time	10:50 am	6:00 pm	1:00 pm	5:30 pm
Incorporation equipment	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	89/80	89/80	89/78	98/84
Relative humidity (%)	28	96	47	37
Wind (mph)	5	0	2	4
Weather	clear	cloudy	clear	clear
Soil moisture	moist	wet	moist	flooded
Crop stage/Height	2-3 lf / 3"	4 lf / 4.5"	1-2 tiller / 12"	panicle / 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.)	20/6/20	21/6/20	24/6/20	25/6/20
Gpa / Psi	10/20	10/20	10/17	10/20
Weed species (density)	---------- (# leaves/height) ----------			
BRAPP (40/ft^2)	3-5 lf / 1-3"	4-6 lf / 8"	1-2 tiller / 6"	N/A
IPOSP (1/ft^2)	1-2 lf / 1-2"	6 lf / 4"	running / 6"	N/A
CYPCP (15/ft^2)	3 lf / 0.5"	8 lf / 2.5"	8-10 lf / 3.5"	N/A

Conclusions: This study was initiated to compare several herbicides for broadleaf control in rice. The area was oversprayed with fenoxaprop (Whip 360) PREFL for annual grass control. All propanil applications at 2- to 3-lf rice provided excellent control of morningglory. Morningglories were then controlled by the flood in all treatments.

Table 19. Section 1.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 6/2	6/16	7/2	7/27	Morningglory species (IPOSP) 6/2	7/2	Annual sedge (CYPCP) 6/16	7/2
	(lb/A)		----------(%)----------							
Check - fenoxaprop	0.063	PREFL	0	93	91	100	0	95	78	45
Triclopyr + AG-98 (0.25%) fb fenoxaprop	0.19 0.063	2-3 lf PREFL	35	95	94	100	73	95	86	81
Propanil (Stam M-4) fb fenoxaprop	3.0 0.063	2-3 lf PREFL	98	95	95	100	25	95	90	83
(Propanil + molinate) fb fenoxaprop	4.5 0.063	2-3 lf PREFL	95	95	95	100	33	95	90	90
Propanil (Stam M-4) + triclopyr + AG-98 (0.25%) fb fenoxaprop	3.0 0.19 0.063	2-3 lf PREFL	95	95	95	100	100	95	88	85
(Propanil + molinate) + triclopyr + AG-98 (0.25%) fb fenoxaprop	4.5 0.19 0.063	2-3 lf PREFL	97	95	95	100	100	95	90	90
Triclopyr + AG-98 (0.25%) fb fenoxaprop	0.25 0.063	4 lf PREFL	0	95	94	100	0	95	78	71
Propanil (stam M-4) + triclopyr + AG-98 (0.25%) fb fenoxaprop	4.0 0.25 0.063	4 lf PREFL	99	95	95	100	100	95	91	95
(Propanil + molinate) + quinclorac + triclopyr + AG-98 (0.25%)	4.5 0.125 0.19	2-3 lf	100	95	95	100	100	95	91	91

continued

Table 19. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 6/2	6/16	7/2	7/27	Morningglory species (IPOSP) 6/2	7/2	Annual sedge (CYPCP) 6/16	7/2
	(lb/A)		(%)							
(Propanil + molinate) +	4.5									
quinclorac +	0.125									
triclopyr +	0.19									
AG-98 (0.25%)		4 lf	98	95	95	100	100	95	90	95
Fenoxaprop fb	0.063	PREFL								
triclopyr +	0.025									
AG-98 (0.25%)		PI	0	95	95	100	0	95	79	81
Fenoxaprop fb	0.063	PREFL								
triclopyr +	0.038									
AG-98 (0.25%)		PI	0	95	95	100	0	95	75	90
Propanil (Stam M-4) +	3.0									
triclopyr +	0.19									
AG-98 (0.25%) fb		2-3 lf								
fenoxaprop fb	0.063	PREFL								
triclopyr +	0.25									
AG-98 (0.25%)		PI	95	95	95	100	99	95	85	91
Propanil (Stam M-4) +	3.0									
triclopyr +	0.19									
AG-98 (0.25%) fb		2-3 lf								
fenoxaprop fb	0.063	PREFL								
propanil (Stam M-4) +	1.0									
triclopyr +	0.25									
AG-98 (0.25%)		PI	93	95	95	100	99	95	81	88
Propanil (Stam M-4) fb	3.0	2-3 lf								
fenoxaprop fb	0.063	PREFL								
2,4-D	1.0	PI	94	95	95	100	0	95	88	90
LSD (0.05)			9	1	NS	NS	32	NS	6	18

continued

Table 19. Section 2.

Herbicide	Rate	Application timing	Weed control: Hemp sesbania SEBEX) 7/2	Weed control: Purple ammannia (AMMCO) 8/28	Effect on rice: Injury 6/2	Injury 7/2	Injury 7/27	Injury 8/28	Yield
	(lb/A)		(%)						(lb/A)
Check - fenoxaprop	0.063	PREFL	95	98	0	0	0	0	5715
Triclopyr + AG-98 (0.25%) fb fenoxaprop	0.19 0.063	2-3 lf PREFL	95	99	0	1	0	0	5040
Propanil (Stam M-4) fb fenoxaprop	3.0 0.063	2-3 lf PREFL	95	99	1	0	0	0	6030
(Propanil + molinate) fb fenoxaprop	4.5 0.063	2-3 lf PREFL	95	99	0	0	0	0	5895
Propanil (Stam M-4 + triclopyr + AG-98 (0.25%) fb fenoxaprop	3.0 0.19 0.063	2-3 lf PREFL	95	98	3	1	0	0	5535
(Propanil + molinate) + triclopyr + AG-98 (0.25%) fb fenoxaprop	4.5 0.19 0.063	2-3 lf PREFL	95	100	3	0	0	0	5400
Triclopyr + AG-98 (0.25%) fb fenoxaprop	0.25 0.063	4 lf PREFL	95	100	0	0	0	0	5085
Propanil (stam M-4) + triclopyr + AG-98 (0.25%) fb fenoxaprop	4.0 0.25 0.063	4 lf PREFL	95	100	5	0	0	0	5175
(Propanil + molinate) + quinclorac + triclopyr + AG-98 (0.25%)	4.5 0.125 0.19	2-3 lf	95	100	4	0	0	0	5265

continued

Table 19. Section 2. Continued.

Herbicide	Rate	Application timing	Weed control: Hemp sesbania (SEBEX) 7/2	Weed control: Purple ammannia (AMMCO) 8/28	Effect on rice: Injury 6/2	Injury 7/2	Injury 7/27	Injury 8/28	Yield
	(lb/A)		(%)						(lb/A)
(Propanil + molinate) +	4.5								
quinclorac +	0.125								
triclopyr +	0.19								
AG-98 (0.25%)		4 lf	95	100	5	0	0	0	5130
Fenoxaprop fb	0.063	PREFL							
triclopyr +	0.025								
AG-98 (0.25%)		PI	95	100	0	0	0	0	5310
Fenoxaprop fb	0.063	PREFL							
triclopyr +	0.038								
AG-98 (0.25%)		PI	95	100	0	0	0	0	5400
Propanil (Stam M-4) +	3.0								
triclopyr +	0.19								
AG-98 (0.25%) fb		2-3 lf							
fenoxaprop fb	0.063	PREFL							
triclopyr +	0.25								
AG-98 (0.25%)		PI	95	99	3	0	0	0	5085
Propanil (Stam M-4) +	3.0								
triclopyr +	0.19								
AG-98 (0.25%) fb		2-3 lf							
fenoxaprop fb	0.063	PREFL							
propanil (Stam M-4) +	1.0								
triclopyr +	0.25								
AG-98 (0.25%)		PI	95	100	2	0	0	0	5175
Propanil (Stam M-4) fb	3.0	2-3 lf							
fenoxaprop fb	0.063	PREFL							
2,4-D	1.0	PI	95	100	0	0	0	0	5895
LSD (0.05)			NS	NS	3	NS	NS	NS	NS

Table 20. Quinclorac flood depth evaluation on grass control in rice, Lonoke, 1998.

TEST INFORMATION

Location	Lonoke
Experimental Design / replications	RCB / 4
Plot size	10 ft by 20 ft
Row width / Number of rows per plot	7.5 in / 14 rows
Soil type	Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH	0.9 / 4.3
Planting date	May 2, 1998
Harvest date	September 5, 1998
Crop/Variety	Rice/Drew
Dates of Flushing	May 7, 14, and 20, 1998
Date of Flooding	June 2, 1998

Comments: 3-5" GR = 3-5" grass stage and 6-10" GR = 6-10" grass stage.

Application type	3-5" GR	6-10" GR
Date applied	June 4, 1998	June 15, 1998
Time	4:30 pm	5:30 pm
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	94 / 84	90 / 88
Relative humidity (%)	51	51
Wind (mph)	5	3.5
Weather	partly cloudy	mostly clear
Soil moisture	flooded	flooded
Crop stage/Height	1-2 tiller / 10"	3-4 tiller / 17"
Sprayer type/mph	BkPkCO_2 / 3	BkPkCO_2 / 3
Nozzle type/Size	Driftguard / TT110015	Driftguard / TT110015
Boom ht / # Noz / Spacing (in.)	20 / 3 / 20	36 / 3 / 20
Gpa / Psi	10 / 26	10 / 20

Conclusions: This study was conducted to compare the spray vs. granular formulation of quinclorac on two grass sizes and at two flooding depths. No previous treatments were applied and barnyardgrass and broadleaf signalgrass pressure was severe. In general, the spray formulation provided better grass control than the granular formulation. The exception was on the small grass in the deep flood where weed coverage was likely not achieved with the spray treatment. In general, both formulations provided better control of the larger grass. Also, the shallow flood appeared to enhance control with the granular formulation compared to the deep flood.

Table 20.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 6/16	7/6	7/27	8/28	Barnyardgrass (ECHCG) 7/27	8/28	Effect on rice: Injury 7/6	7/27	8/28	Yield
	(lb/A)		(%)									(lb/A)
4-6" flood:												
Untreated check			0	0	0	0	0	0	0	0	0	2160
Quinclorac (75 DF) + Agri-Dex (1.25%)	0.375	3-5" GR	0	34	10	0	0	0	0	0	0	2520
Quinclorac (1.5 GR) + Molinate	0.375 + 0.3	3-5" GR	0	58	74	0	78	0	0	0	0	3825
Quinclorac (75 DF) + Agri-Dex (1.25%)	0.375	6-10" GR	0	91	93	89	95	94	0	0	0	5220
Quinclorac (1.5 GR)	0.375	6-10" GR	0	33	20	0	18	0	0	0	0	3555
Molinate	0.3	6-10" GR	0	20	20	0	15	0	0	0	0	3105
1-2" flood:												
Untreated check			0	11	44	83	25	88	0	0	0	3870
Quinclorac (75 DF) + Agri-Dex (1.25%)	0.375	3-5" GR	0	43	75	75	93	89	0	0	0	4635
Quinclorac (1.5 GR)	0.375	3-5" GR	3	79	88	90	91	94	0	0	0	4725
Quinclorac (75 DF) + Agri-Dex (1.25%)	0.375	6-10" GR	0	83	98	91	98	95	0	0	0	5670
Quinclorac (75 DF)	0.375	6-10" GR	0	48	81	85	65	84	0	0	0	4725
LSD (0.05)			1	21	38	5	33	5	NS	NS	NS	720

Table 21. Clomazone (Command) for weed control in rice, Lonoke, 1998.

TEST INFORMATION

Location	Lonoke
Experimental Design / replications	RCB / 4
Plot size	10 ft by 20 ft
Row width / Number of rows per plot	7.5 in / 14 rows
Soil type	Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH	0.9 / 4.3
Planting date	May 2, 1998
Harvest date	September 3, 1998
Crop/Variety	Rice/Drew
Dates of Flushing	May 7, 14, and 20, 1998
Date of Flooding	June 2, 1998

Comments: Bentazon + acifluorfen (Storm) was erroneously applied at 1.5 lb ai/A rather than 0.75 lb/A. PPI = preplant incorporated; PRE = preemergence; DPRE = delayed preemergence; and PREFL = preflood.

Application type	PPI	PRE	DPRE	PREFL
Date applied	May 2, 1998	May 2, 1998	May 5, 1998	June 1, 1998
Time	10:30 am	4:15 pm	10:10 am	11:25 am
Incorporation equipment	field cultivator	N/A	N/A	N/A
Air/Soil temperature (F)	73/68	80/77	84/68	86/88
Relative humidity (%)	49	49	46	47
Wind (mph)	0	2	2	4
Weather	clear	mostly clear	mostly cloudy	clear
Soil moisture	moist	moist	moist	moist
Crop stage/Height	N/A	N/A	N/A	1-2 tiller / 12"
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.)	18/6/20	18/6/20	18/6/20	24.5/6/20
Gpa / Psi	10/21	10/21	10/21	10/23
Weed species (density)	----------	(# leaves/height)	----------	
BRAPP (25/ft^2)	N/A	N/A	N/A	4-9 lf / 2-10"
IPOSP (2/ft^2)	N/A	N/A	N/A	4-6 runner / 4"
SEBEX(<1/ft^2)	N/A	N/A	N/A	8 lf / 10"

Conclusions: The study was designed to evaluate treatments in a program approach with clomazone (Command). High early injury ratings reflect primarily bleaching. Broadleaf signalgrass pressure was severe. Other weed stands, except hemp sesbania, were erratic. Program herbicides will be needed for broadleaf and sedge control. Several treatments controlled hemp sesbania and rice quickly recovered from the early clomazone injury. Clomazone + quinclorac PRE was a good treatment.

Table 21. Section 1.

Herbicide	Rate	Application timing	Weed control									
			Broadleaf signalgrass (BRAPP)					Hemp sesbania (SEBEX)				
			5/15	6/16	7/2	7/27	8/27	5/15	6/16	7/2	7/27	8/27
	(lb/A)		(%)									
Untreated check			11	46	0	24	0	0	23	0	0	0
Clomazone	0.3	PPI	94	90	95	99	95	0	23	6	13	8
Clomazone	0.4	PPI	95	80	95	99	95	23	23	21	21	13
Clomazone fb carfentrazone	0.4 0.02	PRE PREFL	95	88	95	100	98	0	23	63	46	41
Clomazone fb carfentrazone	0.4 0.02	DPRE PREFL	95	90	95	100	94	0	66	33	60	35
Clomazone fb propanil (Stam M-4) + (bentazon + acifluorfen)	0.4 3.0 1.5	PRE PREFL	95	90	95	100	99	23	91	95	100	100
Clomazone fb propanil (Stam M-4) + (bentazon + acifluorfen)	0.4 3.0 1.5	DPRE PREFL	95	90	94	100	100	0	46	95	100	100
Clomazone + quinclorac	0.4 0.25	PRE	95	91	95	100	99	90	85	95	100	98
Clomazone + quinclorac	0.4 0.25	DPRE	95	91	95	100	99	89	68	95	100	100
Clomazone + thiobencarb	0.4 3.0	DPRE	95	80	95	99	95	83	0	34	38	23
Pendimethalin + quinclorac	1.0 0.188	DPRE	95	89	95	100	100	93	89	95	100	100
LSD (0.05)			3	24	1	21	2	28	55	33	29	26

continued

Table 21. Section 2.

Herbicide	Rate	Application timing	Weed control: Morningglory sp. (IPOSP) 5/15	Weed control: Annual sedge (CYPCP) 6/16	Weed control: Annual sedge (CYPCP) 7/2	Effect on rice: Injury 5/15	Effect on rice: Injury 7/2	Effect on rice: Injury 7/27	Yield
	(lb/A)		(%)			(%)			(lb/A)
Untreated check			0	46	58	0	4	0	3240
Clomazone	0.3	PPI	0	33	46	48	0	0	4230
Clomazone	0.4	PPI	21	44	48	73	0	0	4590
Clomazone fb carfentrazone	0.4 0.02	PRE PREFL	21	56	71	79	0	0	5940
Clomazone fb carfentrazone	0.4 0.02	DPRE PREFL	0	68	68	85	0	0	5265
Clomazone fb propanil (Stam M-4) + (bentazon + acifluorfen)	0.4 3.0 1.5	PRE PREFL	24	90	95	81	0	0	6255
Clomazone fb propanil (Stam M-4) + (bentazon + acifluorfen)	0.4 3.0 1.5	DPRE PREFL	0	88	95	84	5	0	5760
Clomazone + quinclorac	0.4 0.25	PRE	90	80	91	75	1	0	6300
Clomazone + quinclorac	0.4 0.25	DPRE	91	88	93	75	0	0	5580
Clomazone + thiobencarb	0.4 3.0	DPRE	60	60	94	79	0	0	4815
Pendimethalin + quinclorac	1.0 0.188	DPRE	93	88	95	0	2	0	5535
LSD (0.05)			37	40	NS	19	NS	NS	1260

Table 22. Clomazone (Command) and quinclorac (Facet) programs for for weed control in rice, Lonoke, 1998.

TEST INFORMATION

Location ..... Lonoke
Experimental Design / replications ..... RCB / 4
Plot size ..... 10 ft by 20 ft
Row width / Number of rows per plot ..... 7.5 in / 14 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.9 / 4.3

Planting date ..... May 2, 1998
Harvest date ..... September 4, 1998
Crop/Variety ..... Rice/Drew
Dates of Flushing ..... May 7, 14, and 20, 1998
Date of Flooding ..... June 2, 1998

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

Application type	PPI	PRE	PREFL
Date applied	May 4, 1998	May 4, 1998	June 1, 1998
Time	1:00 pm	6:20 pm	12:00 pm
Incorporation equipment	field cultivator	N/A	N/A
Air/Soil temperature (F)	80/78	82/78	86/89
Relative humidity (%)	41	42	47
Wind (mph)	5	2	2.5
Weather	mostly clear	clear	clear
Soil moisture	moist	moist	moist
Crop stage/Height	N/A	N/A	1-2 tiller / 12"
Sprayer type/mph	BkPkCO$_2$ / 3	BkPkCO$_2$ / 3	BkPkCO$_2$ / 3
Nozzle type/Size	Driftguard / TT110015	Driftguard / TT110015	Driftguard / TT110015
Boom ht / # Noz / Spacing (in.)	18/6/20	18/6/20	24/6/20
Gpa / Psi	10/21	10/21	10/23
Weed species (density)	---------- (# leaves/height) ----------		
BRAPP (40/ft^2)	N/A	N/A	4 lf / 4-5"
CYPCP (75/ft^2)	N/A	N/A	3 lf / 4"

Conclusions: This trial was conducted to evaluate program approaches to weed control in rice following an application of clomazone (Command) or quinclorac (Facet). Quinclorac alone PPI and PRE provided excellent grass control and rice yields. Clomazone alone provided excellent grass control but released annual sedge. This could cause lower yields with clomazone alone. Most postemergence treatments following clomazone provided good annual sedge control. The test area was in a "cut" soil high in salt. Clomazone injury was worse in the PPI treatments than in PRE treatments. Although injury was greater than normally expected, yields were not significantly reduced.

Table 22. Section 1.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/15	5/30	6/16	7/2	7/27	8/28	Annual sedge (CYPCP) 5/30	6/16	7/2	7/27
	(lb/A)		(%)									
Untreated check			0	0	0	0	0	0	0	63	0	0
Clomazone	0.3	PPI	100	95	95	95	93	100	0	14	0	39
Clomazone	0.4	PPI	99	95	95	95	93	100	0	13	0	40
Clomazone	0.3	PRE	99	94	95	90	91	100	0	26	0	50
Clomazone	0.4	PRE	100	95	95	95	91	100	0	15	0	55
Quinclorac	0.25	PPI	84	83	89	88	88	91	90	91	90	89
Quinclorac	0.375	PPI	89	91	94	94	94	100	90	95	95	93
Quinclorac	0.25	PRE	61	85	84	89	90	95	90	95	93	91
Quinclorac	0.375	PRE	80	93	94	93	90	98	90	95	95	93
Clomazone fb	0.3	PPI										
propanil (Super Wham) +	4.0											
Penetrator Plus (1 pt/A)		PREFL	100	95	96	95	94	100	0	91	60	84
Clomazone fb	0.3	PRE										
propanil (Super Wham) +	4.0											
Penetrator Plus (1 pt/A)		PREFL	96	95	95	95	93	100	0	85	88	85
Quinclorac fb	0.25	PPI										
propanil (Super Wham) +	4.0											
Penetrator Plus (1 pt/A)		PREFL	94	91	95	95	95	100	90	95	94	93
Quinclorac fb	0.25	PRE										
propanil (Super Wham) +	4.0											
Penetrator Plus (1 pt/A)		PREFL	78	88	98	95	94	100	90	96	95	94
Clomazone fb	0.3	PPI										
propanil (Super Wham) +	2.0											
quinclorac +	0.125											
Penetrator Plus (1 pt/A)		PREFL	100	95	95	95	91	100	0	86	60	85
Clomazone fb	0.3	PRE										
propanil (Super Wham) +	2.0											
quinclorac +	0.125											
Penetrator Plus (1 pt/A)		PREFL	99	95	94	95	95	100	0	88	76	93

continued

Table 22. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control									
			Broadleaf signalgrass (BRAPP)						Annual sedge (CYPCP)			
			5/15	5/30	6/16	7/2	7/27	8/28	5/30	6/16	7/2	7/27
	(lb/A)		(%)									
Quinclorac fb	0.25											
propanil (Super Wham) +	2.0											
quinclorac +	0.125											
Penetrator Plus (1 pt/A)		PREFL	95	89	98	95	95	100	90	98	95	95
Quinclorac fb	0.25	PRE										
propanil (Super Wham) +	2.0											
quinclorac +	0.125											
Penetrator Plus (1 pt/A)		PREFL	85	90	96	95	95	100	90	96	95	95
Clomazone fb	0.3	PRE										
propanil (Super Wham) +	3.0											
bensulfuron +	0.038											
Penetrator Plus (1 pt/A)		PREFL	100	95	95	95	95	100	0	89	65	91
Quinclorac fb	0.25	PPI										
propanil (Super Wham) +	3.0											
bensulfuron +	0.038											
Penetrator Plus (1 pt/A)		PREFL	90	88	98	95	93	100	91	98	95	95
Quinclorac fb	0.25	PRE										
propanil (Super Wham) +	3.0											
bensulfuron +	0.038											
Penetrator Plus (1 pt/A)		PREFL	79	89	95	95	94	100	90	95	95	94
Clomazone fb	0.3	PPI										
(bentazon + acifluorfen)	0.75											
+ AG-98 (0.25%)		PREFL	100	95	96	95	90	100	0	96	95	94
Clomazone fb	0.3	PRE										
(bentazon + acifluorfen)	0.75											
+ AG-98 (0.25%)		PREFL	99	95	95	95	94	100	0	95	95	95
Quinclorac fb	0.25	PPI										
(bentazon + acifluorfen)	0.75											
+ AG-98 (0.25%)		PREFL	89	89	96	90	93	95	90	98	95	94

continued

Table 22. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/15	5/30	6/16	7/2	7/27	8/28	Weed control: Annual sedge (CYPCP) 5/30	6/16	7/2	7/27
	(lb/A)		(%)									
Quinclorac fb (bentazon + acifluorfen) + AG-98 (0.25%)	0.25 fb 0.75 + 0.25%	PRE fb PREFL	85	86	95	94	91	99	90	96	95	94
Clomazone fb carfentrazone + AG-98 (0.25%)	0.3 fb 0.02 + 0.25%	PPI fb PREFL	100	95	95	95	88	99	0	49	0	40
LSD (0.05)			9	4	4	5	6	4	1	18	19	25

continued

Table 22. Section 2.

Herbicide	Rate	Application timing	Barnyardgrass (ECHCG) control 8/28	Effect on rice: Injury 5/15	5/30	7/2	Yield
		(lb/A)	(%)				(lb/A)
Untreated check			0	0	0	0	2250
Clomazone	0.3	PPI	100	28	35	0	5535
Clomazone	0.4	PPI	100	39	45	0	5445
Clomazone	0.3	PRE	100	8	21	0	5670
Clomazone	0.4	PRE	100	14	30	0	5535
Quinclorac	0.25	PPI	98	0	10	0	5985
Quinclorac	0.375	PPI	100	0	18	0	5850
Quinclorac	0.25	PRE	100	0	6	0	5895
Quinclorac	0.375	PRE	100	0	19	0	5715

continued

Table 22. Section 2. Continued.

Herbicide	Rate	Application timing	Barnyardgrass (ECHCG) control	Effect on rice			
				Injury			
			8/28	5/15	5/30	7/2	Yield
	(lb/A)		----------(%)----------				(lb/A)
Clomazone fb	0.3	PPI					
propanil (Super Wham) +	4.0						
Penetrator Plus (1 pt/A)		PREFL	100	40	35	0	5760
Clomazone fb	0.3	PRE					
propanil (Super Wham) +	4.0						
Penetrator Plus (1 pt/A)		PREFL	100	6	20	0	5895
Quinclorac fb	0.25	PPI					
propanil (Super Wham) +	4.0						
Penetrator Plus (1 pt/A)		PREFL	100	1	10	0	5895
Quinclorac fb	0.25	PRE					
propanil (Super Wham) +	4.0						
Penetrator Plus (1 pt/A)		PREFL	100	0	13	0	6075
Clomazone fb	0.3	PPI					
propanil (Super Wham) +	2.0						
quinclorac +	0.125						
Penetrator Plus (1 pt/A)		PREFL	100	40	35	0	6030
Clomazone fb	0.3	PRE					
propanil (Super Wham) +	2.0						
quinclorac +	0.125						
Penetrator Plus (1 pt/A)		PREFL	100	8	23	0	6165
Quinclorac fb	0.25						
propanil (Super Wham) +	2.0						
quinclorac +	0.125						
Penetrator Plus (1 pt/A)		PREFL	100	1	16	0	5715
Quinclorac fb	0.25	PRE					
propanil (Super Wham) +	2.0						
quinclorac +	0.125						
Penetrator Plus (1 pt/A)		PREFL	100	0	15	0	6075

continued

Table 22. Section 2. Continued.

Herbicide	Rate	Application timing	Barnyardgrass (ECHCG) control	Effect on rice			
				Injury			
			8/28	5/15	5/30	7/2	Yield
	(lb/A)		(%)				(lb/A)
Clomazone fb	0.3	PRE					
propanil (Super Wham) +	3.0						
bensulfuron +	0.038						
Penetrator Plus (1 pt/A)		PREFL	100	5	21	0	6345
Quinclorac fb	0.25	PPI					
propanil (Super Wham) +	3.0						
bensulfuron +	0.038						
Penetrator Plus (1 pt/A)		PREFL	100	0	10	0	5940
Quinclorac fb	0.25	PRE					
propanil (Super Wham) +	3.0						
bensulfuron +	0.038						
Penetrator Plus (1 pt/A)		PREFL	100	0	11	0	5985
Clomazone fb	0.3	PPI					
(bentazon + acifluorfen)	0.75						
+ AG-98 (0.25%)		PREFL	100	45	45	0	5760
Clomazone fb	0.3	PRE					
(bentazon + acifluorfen)	0.75						
+ AG-98 (0.25%)		PREFL	100	13	31	0	5985
Quinclorac fb	0.25	PPI					
(bentazon + acifluorfen)	0.75						
+ AG-98 (0.25%)		PREFL	100	0	15	0	6030
Quinclorac fb	0.25	PRE					
(bentazon + acifluorfen)	0.75						
+ AG-98 (0.25%)		PREFL	100	0	13	0	6075
Clomazone fb	0.3	PPI					
carfentrazone +	0.02						
AG-98 (0.25%)		PREFL	100	38	35	0	5625
LSD (0.05)			1	9	11	NS	750

Table 23. Red rice control in IMI-tolerant rice, Stuttgart, 1998.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 7.5 ft by 20 ft
Row width / Number of rows per plot ..... 7 in / 9 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.9 / 4.3

Planting date ..... May 12, 1998
Harvest date ..... August 26, 1998
Crop/Variety Rice/93AS3510
Dates of Flushing ..... May 7, 14, and 20, 1998
Date of Flooding ..... June 10, 1998

Comments: PPI = preplant incorporated; PRE = preemergence; DPRE = delayed preemergence; EPOST = early postemergence; PREFL = preflood; and POFL = post flood. IMI-tolerant = rice tolerant to the imidazolinone family of herbicides, which includes imazethapyr (Pursuit).

Application type	PPI	PRE	DPRE	EPOST	PREFL	POFL
Date applied	May 12, 1998	May 12, 1998	May 18, 1998	May 29, 1998	June 8, 1998	June 24, 1998
Time	3:10 pm	6:10 pm	2:00 pm	11:30 am	9:15 am	11:05 am
Incorporation equipment	field cultivator	N/A	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	91 / 84	91 / 84	93 / 84	77 / 84	77 / 74	92 / 84
Relative humidity (%)	84	45	33	84	78	57
Wind (mph)	6.5	6	4	2.5	5	6.5
Weather	clear	clear	clear	cloudy	mostly cloudy	clear
Soil moisture	dry	dry	moist	moist	moist	flooded
Crop stage/Height	N/A	N/A	N/A	2-3 lf / 3-4"	1-2 tiller / 6-7"	5 lf - 2 tiller / 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	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	18 / 4 / 20	18 / 4 / 20	24 / 4 / 20	24 / 4 / 20	20 / 4 / 20	25 / 4 / 20
Gpa / Psi	10 / 20	10 / 20	10 / 20.5	10 / 19	10 / 20	10 / 19.5
Weed species (density)	----------	----------	----------	(# leaves/height)	----------	----------
ORYSA (red rice) (20/ft²)	N/A	N/A	N/A	2-3 lf / 3-4"	1-2 tiller / 6-7"	2 tiller / 15"
BRAPP (15/ft²)	N/A	N/A	N/A	2-3 lf / 0.5"	4-6 lf / 2-4"	N/A
SIDSP (12/ft²)	N/A	N/A	cot. / 0.25"	1-2 lf / 0.75"	3-4 lf / 3"	7 lf / 7"
COMDI (3/ft²)	N/A	N/A	N/A	1-2 lf / 1.5"	5 lf / 3-4"	/6"

Conclusions: The red rice in this study was broadcast seeded the same day the IMI-rice was planted. There was some natural infestation at this site. For effective red rice control, imazethapyr at 0.125 lb ai/A soil-applied or EPOST and split applications of 0.063 lb ai/A were the best treatments. Several treatments with imazethapyr PPI followed by a standard rice herbicide also provided effective results. This study will be repeated with more concentration on PPI followed by EPOST combinations.

Table 23. Section 1.

			Weed control								
			Red rice (ORYSA)				Broadleaf signalgrass (BRAPP)			Prickly sida (SIDSP)	
Herbicide	Rate	Application timing	5/28	6/8	7/1	7/21	5/28	6/8	7/21	5/28	6/8
	(lb/A)		(%)								
Untreated check			0	0	0	0	0	0	0	0	0
Imazethapyr	0.063	PPI	80	66	59	80	94	98	80	98	94
Imazethapyr	0.094	PPI	88	75	75	93	96	90	80	96	94
Imazethapyr	0.125	PPI	90	86	79	98	96	100	100	100	96
Imazethapyr	0.063	PRE	74	51	44	58	90	94	76	93	96
Imazethapyr	0.094	PRE	80	65	56	85	96	93	78	99	99
Imazethapyr	0.125	PRE	85	75	73	99	95	100	83	100	98
Imazethapyr	0.063	DPRE									
Imazethapyr	0.094	DPRE	76	64	60	85	95	93	91	95	98
Imazethapyr	0.125	DPRE	79	71	69	95	99	100	93	98	95
Imazethapyr +	0.063										
AG-98 (0.25%)		EPOST	0	54	60	53	0	90	100	0	38
Imazethapyr +	0.094										
AG-98 (0.25%)		EPOST	0	50	68	68	0	89	91	0	35
Imazethapyr +	0.125										
AG-98 (0.25%)		EPOST	0	55	85	93	0	90	100	0	40
Imazethapyr fb	0.063	PPI									
imazethapyr +	0.063										
AG-98 (0.25%)		PREFL	80	64	90	100	93	90	100	98	95
Imazethapyr fb	0.063	PPI									
imazethapyr +	0.047										
AG-98 (0.25%)		PREFL	81	64	86	100	93	80	100	91	91

continued

Table 23. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control: Red rice (ORYSA) 5/28	6/8	7/1	7/21	Broadleaf signalgrass (BRAPP) 5/28	6/8	7/21	Prickly sida (SIDSP) 5/28	6/8
	(lb/A)		(%)								
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	0	5	64	98	0	0	96	0	0
Pendimethalin + imazethapyr	1.0 0.063	DPRE	76	61	50	0	99	99	84	96	94
Imazethapyr + propanil (Stam M-4) + AG-98 (0.25%)	0.063 3.0	PREFL	0	0	75	93	0	0	90	0	32
Imazethapyr + (bentazon + acifluorfen) + AG-98 (0.25%)	0.063 0.75	PREFL	0	0	56	70	0	0	25	0	0
Imazethapyr + triclopyr + AG-98 (0.25%)	0.063 0.25	PREFL	0	0	69	73	0	0	88	0	0
Imazethapyr + carfentrazone + AG-98 (0.25%)	0.063 0.02	PREFL	0	0	81	93	0	0	95	0	0
Imazethapyr + quinclorac + AG-98 (0.25%)	0.063 0.25	PREFL	0	0	73	81	0	0	93	0	0
(Imazaquin + imazethapyr +pendimethalin)	0.84	DPRE	83	71	25	10	100	96	100	100	96
Imazethapyr + AG-98 (0.25%) fb imazethapyr + AG-98 (0.25%)	0.063 0.063	EPOST PREFL	0	50	86	100	0	90	100	0	84
Imazethapyr + AG-98 (0.25%)	0.094	POFL	0	0	30	45	0	0	60	0	0

continued

Table 23. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control: Red rice (ORYSA) 5/28	6/8	7/1	7/21	Broadleaf signalgrass (BRAPP) 5/28	6/8	7/21	Prickly sida (SIDSP) 5/28	6/8
	(lb/A)		(%)								
Imazethapyr + AG-98 (0.25%)	0.125	POFL	0	0	38	55	0	0	60	0	0
Imazethapyr fb propanil (Super Wham) + Penetrator Plus (1 pt/A)	0.063 fb 3.0	PPI PREFL	80	70	76	83	91	78	100	94	89
Pendimethalin + quinclorac fb propanil (Super Wham) + triclopyr + AG-98 (0.25%)	1.0 0.188 3.0 0.25	DPRE PREFL	0	0	0	0	100	98	100	100	96
LSD (0.05)			6	10	20	16	3	10	18	4	16

continued

Table 23. Section 2.

Herbicide	Rate	Application timing	Spreading dayflower (COMDI) control 5/28	Effect on rice: Injury 5/28	6/8	7/1	7/21	Heading 7/21	Yield
		(lb/A)		(%)					(lb/A)
Untreated check			0	0	0	0	0	0	630
Imazethapyr	0.063	PPI	66	0	0	0	0	56	2520
Imazethapyr	0.094	PPI	70	0	0	5	0	65	3600
Imazethapyr	0.125	PPI	81	0	0	5	0	64	3195
Imazethapyr	0.063	PRE	51	0	0	0	0	25	1665
Imazethapyr	0.094	PRE	61	0	0	3	0	31	1665

continued

Table 23. Section 2. Continued.

Herbicide	Rate	Application timing	Spreading dayflower (COMDI) control	Effect on rice					
				Injury				Heading	
			5/28	5/28	6/8	7/1	7/21	7/21	Yield
	(lb/A)		(%)						(lb/A)
Imazethapyr	0.125	PRE	63	0	0	0	5	34	2475
Imazethapyr	0.063	DPRE							
Imazethapyr	0.094	DPRE	58	0	0	0	0	56	1440
Imazethapyr	0.125	DPRE	63	0	0	0	0	41	2970
Imazethapyr +	0.063								
AG-98 (0.25%)		EPOST	0	0	0	10	0	21	2295
Imazethapyr +	0.094								
AG-98 (0.25%)		EPOST	0	0	0	0	4	18	2925
Imazethapyr +	0.125								
AG-98 (0.25%)		EPOST	0	0	0	6	10	18	4320
Imazethapyr fb	0.063	PPI							
imazethapyr +	0.063								
AG-98 (0.25%)		PREFL	64	0	0	8	0	28	3060
Imazethapyr fb	0.063	PPI							
imazethapyr +	0.047								
AG-98 (0.25%)		PREFL	58	0	0	5	0	49	3645
Imazethapyr +	0.063								
AG-98 (0.25%)		PREFL	0	0	0	18	8	14	2745
Pendimethalin +	1.0								
imazethapyr	0.063	DPRE	61	0	0	5	13	24	1305
Imazethapyr +	0.063								
propanil (Stam M-4) +	3.0								
AG-98 (0.25%)		PREFL	0	0	0	10	7	17	3690
Imazethapyr +	0.063								
(bentazon +									
acifluorfen) +	0.75								
AG-98 (0.25%)		PREFL	0	0	0	8	0	19	1395
Imazethapyr +	0.063								
triclopyr +	0.25								
AG-98 (0.25%)		PREFL	0	0	0	9	10	10	2520

continued

Table 23. Section 2. Continued.

Herbicide	Rate	Application timing	Spreading dayflower (COMDI) control	Effect on rice					
				Injury				Heading	
			5/28	5/28	6/8	7/1	7/21	7/21	Yield
		(lb/A)	(%)						(lb/A)
Imazethapyr + carfentrazone + AG-98 (0.25%)	0.063 0.02	PREFL	0	0	0	4	0	9	3060
Imazethapyr + quinclorac + AG-98 (0.25%)	0.063 0.25	PREFL	0	0	0	18	13	6	3105
(Imazaquin + imazethapyr + pendimethalin)	0.84	DPRE	68	0	0	0	0	28	1350
Imazethapyr + AG-98 (0.25%) fb imazethapyr + AG-98 (0.25%)	0.063 0.063	EPOST PREFL	0	0	0	5	10	11	4005
Imazethapyr + AG-98 (0.25%)	0.094	POFL	0	0	0	5	33	45	1530
Imazethapyr + AG-98 (0.25%)	0.125	POFL	0	0	0	10	58	43	1800
Imazethapyr fb propanil (Super Wham) + Penetrator Plus (1 pt/A)	0.063 3.0	PPI PREFL	58	0	0	5	0	29	2340
Pendimethalin + quinclorac fb propanil (Super Wham) + triclopyr + AG-98 (0.25%)	1.0 0.188 3.0 0.25	DPRE PREFL	46	0	0	0	0	3	585
LSD (0.05)			17	NS	NS	NS	14	22	1260

Table 24. Red rice control in glufosinate (Liberty)-tolerant rice, Stuttgart, 1998.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 7.5 ft by 20 ft
Row width / Number of rows per plot ..... 7 in / 9 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.9 / 4.3

Planting date ..... May 12, 1998
Harvest date ..... N/A
Crop/Variety ..... Rice/LT-Gulfmont
Dates of Flushing ..... May 7, 14, and 20, 1998
Date of Flooding ..... June 10, 1998

Comments: DPRE = delayed preemerngece; 2-3 lf = 2-3 leaf grass; PREFL = preflood; and POFL = post flood.

Application type	DPRE	2-3 lf	PREFL	POFL
Date applied	May 18, 1998	May 29, 1998	June 8, 1998	June 24, 1998
Time	2:30 pm	11:45 am	9:45 am	11:45 am
Incorporation equipment	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	93/84	80/79	84/75	92/84
Relative humidity (%)	33	80	64	57
Wind (mph)	4	2.5	6.5	6
Weather	clear	cloudy	mostly cloudy	clear
Soil moisture	moist	moist	moist	flooded
Crop stage/Height	N/A	2-3 lf / 3.5"	1-2 tiller / 6.5"	3 tiller / 11.5"
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.)	19/4/20	24/4/20	20/4/20	25/4/20
Gpa / Psi	10/20.5	10/19	10/25	10/19.5
Weed species (density)	---------- (# leaves/height) ----------			
ORYSA (red rice) (25/ft^2)	N/A	2-3 lf / 3.5"	2 tiller / 7-8"	3 tiller / 17"
IPOLA (1.5/ft^2)	N/A	2-4 lf / 2"	2-4 lf / 2-4"	running / 10"
SIDSP (7/ft^2)	cot. / 0.25"	2-3 lf / 1"	2-4 lf / 1-2"	N/A
ECHCG (N/A)	N/A	N/A	2-6 lf / 2-6"	N/A

Conclusions: Injury from glufosinate (Liberty) resulted from the POFL applications at this location. This also has been observed in a similar study in 1997. The injury is specific to the Gulfmont Liberty-tolerant rice variety. Sequential applications of glufosinate provided the best full-season control of red rice. Because of potential outcrossing between rice and red rice, the crop was destroyed; thus, no yield data were taken.

Table 24.

Herbicide	Rate	Application timing	Weed control: Red rice (ORYSA) 6/8	Red rice (ORYSA) 7/1	Red rice (ORYSA) 7/21	Pitted morningglory (IPOLA) 6/8	Prickly sida (SIDSP) 6/8	Barnyardgrass (ECHCG) 7/21	Rice injury 7/1	Rice injury 7/21
	(lb/A)		(%)							
Untreated check			0	0	0	0	0	0	0	0
Glufosinate	0.25	2-3 lf	94	46	65	100	100	56	0	0
Glufosinate	0.375	2-3 lf	95	53	76	100	100	64	0	0
Glufosinate	0.5	2-3 lf	99	69	92	100	78	76	0	0
Glufosinate	0.75	2-3 lf	100	94	98	99	100	97	0	0
Glufosinate	0.25	PREFL	0	45	83	0	0	51	4	0
Glufosinate	0.375	PREFL	0	63	91	0	0	71	4	0
Glufosinate	0.5	PREFL	0	84	96	0	0	88	5	0
Glufosinate	0.75	PREFL	0	89	97	0	0	92	0	0
Glufosinate	0.25	POFL	0	58	64	0	0	68	23	0
Glufosinate	0.375	POFL	0	78	70	0	0	84	24	3
Glufosinate	0.5	POFL	0	83	75	0	0	87	23	10
Glufosinate	0.75	POFL	0	84	74	0	0	89	25	3
Glufosinate fb glufosinate	0.25 fb 0.25	2-3 lf fb PREFL	96	96	99	100	100	97	0	0
Glufosinate fb glufosinate	0.375 fb 0.375	2-3 lf fb PREFL	98	100	100	100	100	99	0	0
Glufosinate fb glufosinate	0.5 fb 0.5	2-3 lf fb PREFL	100	100	97	100	100	99	3	0
Glufosinate fb glufosinate	0.375 fb 0.375	2-3 lf fb POFL	100	79	94	100	100	88	9	0
Glufosinate fb glufosinate	0.5 fb 0.5	2-3 lf fb POFL	99	92	95	100	100	96	23	0

continued

Table 24. Continued.

Herbicide	Rate	Application timing	Weed control: Red rice (ORYSA) 6/8	Red rice (ORYSA) 7/1	Red rice (ORYSA) 7/21	Pitted morningglory (IPOLA) 6/8	Prickly sida (SIDSP) 6/8	Barnyardgrass (ECHCG) 7/21	Rice injury 7/1	Rice injury 7/21
	(lb/A)		(%)							
Glufosinate +	0.25									
propanil (Stam M-4) fb	2.0	2-3 lf								
glufosinate +	0.25									
propanil (Stam M-4)	2.0	PREFL	100	97	100	100	100	98	0	0
Glufosinate +	0.375									
propanil (Stam M-4) fb	2.0	2-3 lf								
glufosinate +	0.375									
propanil (Stam M-4)	2.0	PREFL	100	100	100	100	100	100	0	0
Propanil (Stam M-4) fb	3.0	2-3 lf								
glufosinate	0.375	PREFL	0	71	93	50	100	74	0	0
Propanil (Stam M-4) fb	3.0	2-3 lf								
glufosinate	0.5	PREFL	0	80	95	74	100	86	0	0
Propanil (Stam M-4) fb	3.0	2-3 lf								
glufosinate	0.5	POFL	0	76	68	50	75	79	20	4
Propanil (Stam M-4) fb	3.0	2-3 lf								
glufosinate	0.75	POFL	0	79	70	50	100	84	23	3
Quinclorac +	0.188									
pendimethalin fb	1.0	DPRE								
glufosinate	0.5	PREFL	0	88	97	0	100	91	0	0
Pendimethalin fb	1.0	DPRE								
glufosinate	0.5	PREFL	0	76	93	0	75	85	0	0
Glufosinate +	0.375									
quinclorac	0.25	2-3 lf	98	88	91	100	100	89	0	0
Quinclorac +	0.25									
glufosinate fb	0.375	2-3 lf								
glufosinate	0.375	PREFL	98	99	98	100	100	99	0	0
Glufosinate +	0.5									
thiobencarb	3.0	2-3 lf	100	89	96	100	100	92	0	0

continued

Table 24. Continued.

Herbicide	Rate	Application timing	Weed control: Red rice (ORYSA) 6/8	Red rice (ORYSA) 7/1	Red rice (ORYSA) 7/21	Pitted morningglory (IPOLA) 6/8	Prickly sida (SIDSP) 6/8	Barnyardgrass (ECHCG) 7/21	Rice injury 7/1	Rice injury 7/21
	(lb/A)		(%)							
Glufosinate + thiobencarb fb glufosinate	0.375 3.0 0.375	2-3lf POFL	99	96	94	100	100	98	5	0
LSD (0.05)			3	18	14	29	22	19	7	3

Table 25. Preemergence tank-mixes of imazethapyr with quinclorac and clomazone in IMI-tolerant rice, Lonoke, 1998.

TEST INFORMATION

Location ..... Lonoke
Experimental Design / replications ..... RCB / 4
Plot size ..... 10 ft by 20 ft
Row width / Number of rows per plot ..... 7.5 in / 14 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.9 / 4.3

Planting date ..... May 1, 1998
Harvest date ..... August 8, 1998
Crop/Variety ..... IMI-tolerant rice/93AS3510
Dates of Flushing ..... May 7, 14, and 20, 1998
Date of Flooding ..... June 2, 1998

Comments: PPI = preplant incorporated; PRE = preplant; and DPRE = delayed preemergence. IMI-tolerant = rice tolerant to imidazolinone herbicides.

Application type	PPI	PRE	DPRE
Date applied	May 1, 1998	May 2, 1998	May 4, 1998
Time	12:15 pm	3:20 pm	4:45 pm
Incorporation equipment	field cultivator	N/A	N/A
Air/Soil temperature (F)	74/72	83/77	82/83
Relative humidity (%)	44	43	37
Wind (mph)	3	0	2
Weather	clear	mostly cloudy	mostly clear
Soil moisture	moist	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.)	18/6/20	18/6/20	18/6/20
Gpa / Psi	10/21	10/21	10/21
Weed species	----------	(# leaves/height)	----------
BRAPP	N/A	N/A	N/A

Conclusions: This study was initiated to compare soil-applied treatments of imazethapyr with quinclorac and clomazone in IMI-tolerant rice. All three herbicides applied alone provided excellent control of the grasses present. However, the clomazone treatments did not control the rice flatsedge. The tank-mixes of imazethapyr and clomazone provided excellent control of all weeds present. There seemed to be slight antagonism between imazethapyr and quinclorac, although weed control was very good. The quinclorac + clomazone treatments also provided 100% control of the weeds present. This study will be repeated with a closer look at the possible antagonism with imazethapyr + quinclorac.

Table 25. Section 1.

			Weed control										
			Broadleaf signalgrass (BRAPP)					Barnyardgrass (ECHCG) Resistant					Barnyardgrass (ECHCG) Susceptible
Herbicide	Rate	Application timing	5/15	5/27	6/17	7/6	7/27	5/18	5/27	6/17	7/6	7/27	7/6
	(lb/A)		(%)										
Untreated check			0	0	0	0	0	0	0	0	0	0	0
Imazethapyr	0.063	PPI	90	95	100	100	98	63	90	100	100	95	100
Imazethapyr	0.063	PRE	89	95	100	100	98	71	94	100	100	95	100
Imazethapyr	0.063	DPRE	86	95	100	100	98	65	85	100	100	100	100
Clomazone	0.4	PPI	95	100	100	100	100	95	100	100	100	100	100
Clomazone	0.4	PRE	94	100	100	100	100	94	100	100	100	100	100
Clomazone	0.4	DPRE	95	100	99	100	100	95	100	98	100	100	100
Quinclorac	0.375	PPI	86	100	100	100	96	75	95	100	100	95	100
Quinclorac	0.375	PRE	93	98	100	100	100	89	98	100	100	100	100
Quinclorac	0.375	DPRE	94	100	100	100	100	89	99	100	100	100	100
Imazethapyr + clomazone	0.063 0.3	PPI	96	100	100	100	100	89	100	100	100	100	100
Imazethapyr + clomazone	0.063 0.3	PRE	98	100	100	100	100	95	100	100	100	100	100
Imazethapry + clomazone	0.063 0.3	DPRE	98	100	100	100	100	95	100	100	100	100	100
Imazethapyr + clomazone	0.047 0.3	PPI	96	100	100	100	100	91	99	100	100	100	100
Imazethapyr + clomazone	0.047 0.3	PRE	98	100	100	100	100	94	100	100	100	100	100
Imazethapyr + clomazone	0.047 0.3	DPRE	96	98	100	100	100	100	94	100	100	100	100
Imazethapyr + quinclorac	0.063 0.188	PPI	93	99	100	100	96	70	95	100	100	98	100
Imazethapyr + quinclorac	0.063 0.188	PRE	88	95	100	100	93	75	96	100	100	94	100
Imazethapyr + quinclorac	0.063 0.188	DPRE	94	99	100	100	98	80	93	100	100	100	100

continued

Table 25. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control										
			Broadleaf signalgrass (BRAPP)					Barnyardgrass (ECHCG) Resistant					Barnyardgrass (ECHCG) Susceptible
			5/15	5/27	6/17	7/6	7/27	5/18	5/27	6/17	7/6	7/27	7/6
	(lb/A)		(%)										
Imazethapyr + quinclorac	0.047 0.188	PPI	90	99	100	100	95	66	89	100	100	89	100
Imazethapyr + quinclorac	0.047 0.188	PRE	90	98	100	100	98	75	95	100	100	100	100
Imazethapyr + quinclorac	0.047 0.188	DPRE	89	95	100	100	96	80	93	100	100	100	100
Clomazone + quinclorac	0.3 0.188	PPI	96	100	100	100	100	91	100	100	100	100	100
Clomazone + quinclorac	0.3 0.188	PRE	99	100	100	100	100	94	100	100	100	100	100
Clomazone + quinclorac	0.3 0.188	DPRE	95	100	100	100	100	96	100	100	100	100	100
Imazethapyr + thiobencarb	0.063 3.0	DPRE	93	100	100	100	100	89	99	100	100	100	100
LSD (0.05)			6	4	1	1	6	10	6	1	1	7	1

continued

Table 25. Section 2.

Herbicide	Rate	Application timing	Rice flatsedge (CYPIR) control		Effect on rice					
					Injury				Heading	
			5/15	5/27	5/15	5/27	6/17	7/6	7/6	Yield
	(lb/A)		---(%)---							(lb/A)
Untreated check			0	0	0	0	0	0	15	2115
Imazethapyr	0.063	PPI	100	100	6	0	0	0	73	4545
Imazethapyr	0.063	PRE	100	100	3	0	4	4	64	4140
Imazethapyr	0.063	DPRE	100	100	4	6	0	0	63	3870
Clomazone	0.4	PPI	5	0	23	15	5	5	53	4590
Clomazone	0.4	PRE	0	0	15	16	5	5	70	4050
Clomazone	0.4	DPRE	5	0	25	13	8	9	59	4095
Quinclorac	0.375	PPI	100	100	0	0	9	6	51	3825
Quinclorac	0.375	PRE	100	99	3	3	21	18	18	4365
Quinclorac	0.375	DPRE	100	100	1	0	18	25	16	4410
Imazethapyr + clomazone	0.063 0.3	PPI	100	100	11	5	5	3	76	3915
Imazethapyr + clomazone	0.063 0.3	PRE	100	100	9	9	0	0	54	4815
Imazethapry + clomazone	0.063 0.3	DPRE	95	95	26	10	3	0	58	4770
Imazethapyr + clomazone	0.047 0.3	PPI	100	100	13	3	5	11	70	4140
Imazethapyr + clomazone	0.047 0.3	PRE	100	100	14	10	5	3	70	4230
Imazethapyr + clomazone	0.047 0.3	DPRE	100	100	14	9	0	4	55	4590
Imazethapyr + quinclorac	0.063 0.188	PPI	100	100	10	0	6	8	60	3510
Imazethapyr + quinclorac	0.063 0.188	PRE	100	100	4	0	4	13	43	4410
Imazethapyr + quinclorac	0.063 0.188	DPRE	100	100	10	0	5	11	61	3870

continued

Table 25. Section 2. Continued.

Herbicide	Rate	Application timing	Rice flatsedge (CYPIR) control		Effect on rice					
					Injury				Heading	
			5/15	5/27	5/15	5/27	6/17	7/6	7/6	Yield
	(lb/A)		----------(%)----------							(lb/A)
Imazethapyr + quinclorac	0.047 0.188	PPI	100	99	16	0	5	4	63	3555
Imazethapyr + quinclorac	0.047 0.188	PRE	100	100	0	0	0	0	48	4320
Imazethapyr + quinclorac	0.047 0.188	DPRE	100	100	5	0	0	4	55	4050
Clomazone + quinclorac	0.3 0.188	PPI	100	99	8	5	9	20	64	3735
Clomazone + quinclorac	0.3 0.188	PRE	100	100	11	6	3	5	64	4050
Clomazone + quinclorac	0.3 0.188	DPRE	100	100	11	4	6	14	60	3645
Imazethapyr + thiobencarb	0.063 3.0	DPRE	100	100	6	0	0	0	69	3285
LSD (0.05)			5	3	17	6	9	10	25	NS

Table 26. Imazethapyr + pendimethalin for weed control in IMI-tolerant rice, Lonoke, 1998.

TEST INFORMATION

Location	Lonoke
Experimental Design / replications	RCB / 4
Plot size	10 ft by 20 ft
Row width / Number of rows per plot	7.5 in / 14 rows
Soil type	Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH	0.9 / 4.3
Planting date	May 1, 1998
Harvest date	August 8, 1998
Crop/Variety	IMI-tolerant rice/93AS3510
Dates of Flushing	May 7, 14, and 20, 1998
Date of Flooding	June 2, 1998

Comments: PRE = preplant; DPRE = delayed preemergence; and SPIKE = spiking stage. IMI-tolerant = rice tolerant to imidazolinone herbicides.

Application type	PRE	DPRE	SPIKE
Date applied	May 2, 1998	May 4, 1998	May 8, 1998
Time	3:45 pm	4:25 pm	3:35 pm
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	83 / 78	83 / 84	86 / 80
Relative humidity (%)	42	43	37
Wind (mph)	0	2	5
Weather	mostly cloudy	mostly clear	clear
Soil moisture	moist	moist	saturated
Crop stage/Height	N/A	N/A	spike / 0.25"
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	18 / 6 / 20
Gpa / Psi	10 / 21	10 / 21	10 / 22
Weed species (density)		(# leaves/height)	
BRAPP (8/ft^2)	N/A	N/A	1 lf / 0.25"
CYPIR (40/ft^2)	N/A	N/A	1 lf / 0.125"

Conclusions: This study evaluated the tolerance of IMI-rice to imazethapyr and pendimethalin at various application timings. Pendimethalin applied PRE and DPRE provided good broadleaf signalgrass control until mid- to late-season. Pendimethalin applied to spiking rice did not perform as well. All of the other treatments provided excellent season-long control.

Table 26. Section 1.

Herbicide	Rate	Application timing	Weed control						
			Broadleaf signalgrass (BRAPP)					Rice flatsedge (CYPIR)	
			5/15	5/27	6/16	7/6	7/27	5/15	5/27
	(lb/A)		(%)						
Untreated check			0	0	0	0	10	0	0
Pendimethalin	1.0	PRE	84	84	90	93	78	93	91
Pendimethalin	1.0	DPRE	74	76	98	84	74	90	90
Pendimethalin	1.0	SPIKE	28	61	86	56	60	40	74
Imazethapyr	0.063	PRE	93	99	100	100	100	100	100
Imazethapyr	0.125	PRE	93	98	100	100	100	100	100
Imazethapyr + AG-98 (0.25%)	0.063	DPRE	91	95	100	100	100	100	100
Imazethapyr + AG-98 (0.25%)	0.125	DPRE	93	99	100	100	100	100	100
Imazethapyr + AG-98 (0.25%)	0.063	SPIKE	84	98	100	100	100	99	100
Imazethapyr + AG-98 (0.25%)	0.125	SPIKE	86	98	100	100	100	99	100
Imazethapyr + pendimethalin	0.063 1.0	PRE	98	100	100	100	100	100	100
Imazethapyr + pendimethalin	0.125 1.0	PRE	96	100	100	100	100	100	100
Imazethapyr + pendimethalin + AG-98 (0.25%)	0.063 1.0	DPRE	96	100	100	100	100	100	100
Imazethapyr + pendimethalin + AG-98 (0.25%)	0.125 1.0	DPRE	98	100	100	100	100	100	100
Imazethapyr + pendimethalin + AG-98 (0.25%)	0.063 1.0	SPIKE	90	98	100	100	100	100	100

continued

Table 26. Section 1.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/15	5/27	6/16	7/6	7/27	Rice flatsedge (CYPIR) 5/15	5/27
	(lb/A)		(%)						
Imazethapyr + pendimethalin + AG-98 (0.25%)	0.125 1.0	SPIKE	89	99	100	100	100	100	100
LSD (0.05)			8	6	7	8	8	10	6

continued

Table 26. Section 2.

Herbicide	Rate	Application timing	Effect on rice: Injury 5/15	5/27	6/16	7/6	Heading 7/6	Yield
	(lb/A)		(%)					(lb/A)
Untreated check			0	0	0	0	40	1710
Pendimethalin	1.0	PRE	3	3	5	13	48	2970
Pendimethalin	1.0	DPRE	0	3	5	5	41	2700
Pendimethalin	1.0	SPIKE	0	3	8	10	54	2565
Imazethapyr	0.063	PRE	0	10	9	10	41	2790
Imazethapyr	0.125	PRE	1	14	16	28	35	2790
Imazethapyr + AG-98 (0.25%)	0.063	DPRE	1	6	9	18	54	3060
Imazethapyr + AG-98 (0.25%)	0.125	DPRE	1	9	18	18	44	2970
Imazethapyr + AG-98 (0.25%)	0.063	SPIKE	0	6	10	11	39	3060
Imazethapyr + AG-98 (0.25%)	0.125	SPIKE	4	13	18	16	34	2610

continued

Table 26. Section 2. Continued.

Herbicide	Rate	Application timing	Effect on rice: Injury 5/15	Injury 5/27	Injury 6/16	Injury 7/6	Heading 7/6	Yield
	(lb/A)		(%)					(lb/A)
Imazethapyr + pendimethalin	0.063 1.0	PRE	1	8	9	8	43	2790
Imazethapyr + pendimethalin	0.125 1.0	PRE	1	16	24	25	18	2655
Imazethapyr + pendimethalin + AG-98 (0.26%)	0.063 1.0	DPRE	1	10	6	15	38	2790
Imazethapyr + pendimethalin + AG-98 (0.25%)	0.125 1.0	DPRE	3	19	28	43	26	2610
Imazethapyr + pendimethalin + AG-98 (0.25%)	0.063 1.0	SPIKE	0	3	8	15	49	2655
Imazethapyr + pendimethalin + AG-98 (0.25%)	0.125 1.0	SPIKE	0	16	20	28	21	2520
LSD (0.05)			NS	6	10	10	22	495

Table 27. Broadleaf signalgrass and propanil-resistant barnyardgrass in IMI-tolerant rice, Lonoke, 1998.

TEST INFORMATION

Location ..... Lonoke
Experimental Design / replications ..... RCB / 4
Plot size ..... 10 ft by 20 ft
Row width / Number of rows per plot ..... 7.5 in / 14 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.9 / 4.3

Planting date ..... May 1, 1998
Harvest date ..... August 8, 1998
Crop/Variety Rice/93AS3510
Dates of Flushing ..... May 7, 14, and 20, 1998
Date of Flooding ..... June 2, 1998

Comments: PPI = preplant incorporated; PRE = preplant; DPRE = delayed preemergence; EPOST - early postemergence; PREFL = preflood; and POFL = postflood. IMI-tolerant = rice tolerant to imidazolinone herbicides.

Application type	PPI	PRE	DPRE	EPOST	PREFL	POFL
Date applied	May 1, 1998	May 2, 1998	May 4, 1998	May 18, 1998	June 1, 1998	June 8, 1998
Time	12:45 pm	2:45 pm	3:45 pm	4:55 pm	12:00 pm	11:00 am
Incorporation equipment	Field cultivator	N/A	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	78/72	81/78	85/84	96/84	86/89	81/74
Relative humidity (%)	46	40	41	40	47	78
Wind (mph)	3	0	2	5	1	5
Weather	clear	partly cloudy	mostly clear	mostly clear	clear	cloudy
Soil moisture	moist	moist	moist	moist	moist	flooded
Crop stage/Height	N/A	N/A	N/A	3 lf / 4"	1-2 tiller / 12"	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	10/22
Weed species (density)	----------	----------	----------	(# leaves/height)	----------	----------
BRAPP (25/ft^2)	N/A	N/A	N/A	3 lf / 2"	4 tiller / 8"	tiller / 13"
CYPIR (70/ft^2)	N/A	N/A	N/A	3 lf / 0.25"	3-5 lf / 2-3"	N/A
Propanil-resistant ECHCG (200/ft^2)	N/A	N/A	N/A	2 lf / 1.5"	1 tiller / 11"	tiller / 15"

Conclusions: Single applications of imazethapyr PRE or POFL did not effectively control the grasses. All other applications provided excellent broadleaf signalgrass control. Several single applications provided effective control of propanil-resistant barnyardgrass. The most consistent treatments were the split applications of imazethapyr. This study will be repeated in 1999 with more soil-applied followed by EPOST applications.

Table 27. Section 1.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/15	6/16	7/2	7/27	8/27	Propanil-resistant barnyardgrass (ECHCG) 5/15	6/16	7/2	7/27	8/27
	(lb/A)		(%)									
Untreated check			0	0	0	0	0	0	0	0	0	0
Imazethapyr	0.063	PPI	96	96	100	100	100	65	100	90	100	78
Imazethapyr	0.094	PPI	98	100	100	100	100	80	93	98	100	100
Imazethapyr	0.125	PPI	98	99	100	100	100	81	100	99	100	78
Imazethapyr	0.063	PRE	96	96	100	100	100	70	100	95	100	100
Imazethapyr	0.094	PRE	95	96	100	100	100	74	100	94	100	78
Imazethapyr	0.125	PRE	90	98	100	100	100	78	100	96	100	78
Imazethapyr	0.063	DPRE	90	95	100	100	100	70	100	86	100	100
Imazethapyr	0.094	DPRE	92	97	100	100	100	75	100	93	100	100
Imazethapyr	0.125	DPRE	95	98	100	100	100	79	100	96	100	100
Imazethapyr +	0.063											
AG-98 (0.25%)		EPOST	18	83	100	100	100	0	100	70	100	100
Imazethapyr +	0.094											
AG-98 (0.25%)		EPOST	35	85	100	100	100	0	100	76	100	100
Imazethapyr +	0.125											
AG-98 (0.25%)		EPOST	0	81	100	100	100	0	100	73	100	100
Imazethapyr fb	0.063	PPI										
imazethapyr +	0.063											
AG-98 (0.25%)		PREFL	94	95	100	100	100	74	100	94	100	78
Imazethapyr fb	0.063	PPI										
imazethapyr +	0.047											
AG-98 (0.25%)		PREFL	94	95	100	100	100	69	100	95	100	100

continued

Table 27. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/15	6/16	7/2	7/27	8/27	Propanil-resistant barnyardgrass (ECHCG) 5/15	6/16	7/2	7/27	8/27
	(lb/A)		(%)									
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	0	0	83	74	79	0	91	0	78	91
Pendimethalin + imazethapyr	1.0 0.063	DPRE	94	100	100	100	100	94	100	100	100	100
Imazethapyr + propanil (Stam M-4) + AG-98 (0.25%)	0.063 3.0	PREFL	0	0	95	98	93	0	98	0	93	93
Imazethapyr + (bentazon + acifluorfen) + AG-98 (0.25%)	0.063 0.75	PREFL	0	0	66	41	48	0	80	0	63	84
Imazethapyr + triclopyr + AG-98 90.25%)	0.063 0.25	PREFL	0	0	69	44	51	0	76	0	63	73
Imazethapyr + carfentrazone + AG-98 (0.25%)	0.063 0.02	PREFL	0	0	71	60	63	0	80	0	70	88
Imazethapyr + quinclorac + AG-98 (0.25%)	0.063 0.25	PREFL	0	0	78	73	78	0	81	0	76	90
(Imazaquin + imazethapyr + pendimethalin)	0.836	DPRE	98	100	100	100	100	94	100	99	100	100
Imazethapyr + AG-98 (0.25%) fb imazethapyr + AG-98 (0.25%)	0.063 EPOST 0.063	PREFL	0	86	100	100	100	0	100	76	100	100
Imazethapyr + AG-98 (0.25%)	0.094	POFL	0	0	33	50	40	0	40	0	67	87
Imazethapyr + AG-98 (0.25%)	0.125	POFL	20	0	45	61	53	0	48	0	85	90

continued

Table 27. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/15	6/16	7/2	7/27	8/27	Propanil-resistant barnyardgrass (ECHCG) 5/15	6/16	7/2	7/27	8/27
	(lb/A)		(%)									
Imazethapyr fb	0.063	PPI										
propanil (Super Wham) +	3.0											
Penetrator Plus (1 pt/A)		PREFL	94	99	100	100	90	75	99	95	100	100
Pendimethalin +	1.0											
quinclorac fb	0.188											
propanil (Super Wham) +	3.0											
triclopyr +	0.25											
AG-98 (0.25%)		PREFL	95	100	100	100	100	95	100	100	100	78
LSD (0.05)			10	4	10	20	21	8	13	10	18	28

continued

Table 27. Section 2.

Herbicide	Rate	Application timing	Rice flatsedge (CYPIR) control 5/15	5/27	Effect on rice: Injury 5/15	5/27	6/16	7/9	Heading 7/9	Yield
		(lb/A)	(%)							(lb/A)
Untreated check			0	0	0	0	0	0	25	1395
Imazethapyr	0.063	PPI	100	100	0	5	3	9	70	2655
Imazethapyr	0.094	PPI	100	100	0	10	14	18	50	2745
Imazethapyr	0.125	PPI	100	100	0	10	25	35	23	2475
Imazethapyr	0.063	PRE	100	100	0	5	10	13	65	2745
Imazethapyr	0.094	PRE	100	100	3	11	13	21	50	2745
Imazethapyr	0.125	PRE	100	100	8	15	13	26	30	2520
Imazethapyr	0.063	DPRE	100	100	0	0	4	9	63	2610
Imazethapyr	0.094	DPRE	100	100	2	10	15	17	33	2565
Imazethapyr	0.125	DPRE	100	100	0	11	14	25	35	2790

continued

Table 27. Section 2. Continued.

Herbicide	Rate	Application timing	Rice flatsedge (CYPIR) control		Effect on rice					
					Injury				Heading	
			5/15	5/27	5/15	5/27	6/16	7/9	7/9	Yield
		(lb/A)	(%)							(lb/A)
Imazethapyr +	0.063									
AG-98 (0.25%)		EPOST	15	85	0	18	21	34	14	2340
Imazethapyr +	0.094									
AG-98 (0.25%)		EPOST	34	94	0	15	20	31	14	2655
Imazethapyr +	0.125									
AG-98 (0.25%)		EPOST	0	86	0	23	43	55	3	2340
Imazethapyr fb	0.063	PPI								
imazethapyr +	0.063									
AG-98 (0.25%)		PREFL	100	100	0	5	11	18	53	2655
Imazethapyr fb	0.063	PPI								
imazethapyr +	0.047									
AG-98 (0.25%)		PREFL	100	100	0	3	8	3	51	2385
Imazethapyr +	0.063									
AG-98 (0.25%)		PREFL	0	0	0	0	10	10	44	2340
Pendimethalin +	1.0									
imazethapyr	0.063	DPRE	100	100	0	3	3	9	53	2655
Imazethapyr +	0.063									
propanil (Stam M-4) +	3.0									
AG-98 (0.25%)		PREFL	0	0	0	0	20	28	16	2640
Imazethapyr +	0.063									
(bentazon + acifluorfen)	0.75									
+ AG-98 (0.25%)		PREFL	0	0	0	0	10	5	28	1755
Imazethapyr +	0.063									
triclopyr +	0.25									
AG-98 (0.25%)		PREFL	0	0	0	0	13	10	31	1980
Imazethapyr +	0.063									
carfentrazone +	0.02									
AG-98 (0.25%)		PREFL	0	0	0	0	0	10	46	1935

continued

Table 27. Section 2. Continued.

Herbicide	Rate	Application timing	Rice flatsedge (CYPIR) control 5/15	5/27	Effect on rice: Injury 5/15	5/27	6/16	7/9	Heading 7/9	Yield
		(lb/A)	----------(%)----------							(lb/A)
Imazethapyr + quinclorac + AG-98 (0.25%)	0.063 0.25	PREFL	0	0	0	0	9	10	29	2160
(Imazaquin + imazethapyr + pendimethalin)	0.836	DPRE	100	100	3	4	5	5	64	2610
Imazethapyr + AG-98 (0.25%) fb	0.063	EPOST								
imazethapyr + AG-98 (0.25%0	0.063	PREFL	0	89	0	19	36	40	6	2160
Imazethapyr + AG-98 (0.25%)	0.094	POFL	0	0	0	0	7	25	10	1305
Imazethapyr + AG-98 (0.25%)	0.125	POFL	53	0	0	0	4	15	10	1755
Imazethapyr fb propanil (Super Wham) + Penetrator Plus (1 pt/A)	0.063 3.0	PPI PREFL	100	100	0	0	9	11	50	2070
Pendimethalin + quinclorac fb propanil (Super Wham) + triclopyr + AG-98 (0.25%)	1.0 0.188 3.0 0.25	PREFL	100	100	0	0	15	16	48	2700
LSD (0.05)			18	7	2	7	13	15	27	765

Table 28. Sequential applications in IMI-tolerant rice, Lonoke, 1998.

TEST INFORMATION

Location ..... Lonoke
Experimental Design / replications ..... Factorial on an RCB / 4
Plot size ..... 10 ft by 20 ft
Row width / Number of rows per plot ..... 7.5 in / 14 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.9 / 4.3

Planting date ..... May 1, 1998
Harvest date ..... August 5, 1998
Crop/Variety ..... IMI-tolerant rice/93AS3510
Dates of Flushing ..... May 7, 14, and 20, 1998
Date of Flooding ..... June 2, 1998

Comments: PPI = preplant incorporated; PRE = preplant; DPRE = delayed preemergence; and PREFL = preflood. IMI-tolerant = rice tolerant to imidazolinone herbicides.

Application type	PPI	PRE	DPRE	PREFL
Date applied	May 1, 1998	May 2, 1998	May 4, 1998	June 1, 1998
Time	1:00 pm	2:20 pm	3:00 pm	1:25 pm
Incorporation equipment	Field cultivator	N/A	N/A	N/A
Air/Soil temperature (F)	75/72	78/78	84/84	89/89
Relative humidity (%)	47	49	38	47
Wind (mph)	3	0	2	3
Weather	clear	mostly cloudy	mostly clear	clear
Soil moisture	moist	moist	moist	moist
Crop stage/Height	N/A	N/A	N/A	1-2 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.)	18/6/20	18/6/20	18/6/20	26/6/20
Gpa / Psi	10/21	10/21	10/21	10/20
Weed species (density)	----------	(# leaves/height)	----------	
BRAPP (22/ft^2)	N/A	N/A	N/A	3-4" tiller / 8"
CYPIR (15/ft^2)	N/A	N/A	N/A	6 lf / 3"
MOLVE (12/ft^2)	N/A	N/A	N/A	6-8 lf / 0.5"

Conclusions: This study was initiated to compare several standard PREFL treatments applied alone and following a 0.063 rate of imazethapyr PPI, PRE, or DPRE. Of treatments applied at PREFL only, propanil + imazethapyr (0.031 lb ai/A) provided the best control of broadleaf signalgrass and yielded the highest. All the soil-applied treatments provided 100% control of broadleaf signalgrass and did not need the PREFL application.

Table 28. Section 1.

Herbicide	Rate	Application timing	Weed control						
			Broadleaf signalgrass (BRAPP)					Rice flatsedge (CYPIR)	
			5/15	5/29	6/15	7/6	7/27	5/15	5/29
	(lb/A)		(%)						
Untreated check			0	0	0	0	0	0	0
Propanil (Super Wham) + Penetrator Plus (1 pt/A)	4.0	PREFL	0	0	85	80	65	0	0
Propanil (Super Wham) + quinclorac + Penetrator Plus (1 pt/A)	2.0 0.125	PREFL	0	0	90	83	78	0	0
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	0	0	88	88	71	0	0
Propanil (Super Wham) + imazethapyr + Penetrator Plus (1 pt/A)	2.0 0.031	PREFL	0	0	95	98	94	0	0
Propanil (Super wham) + triclopyr + Penetrator Plus (1 pt/A)	2.0 0.25	PREFL	0	0	81	63	51	0	0
Propanil (Super Wham) + carfentrazone, 0.02 Penetrator Plus (1 pt/A)	2.0	PREFL	0	0	88	48	56	0	0
Imazethapyr	0.063	PPI	95	100	100	100	100	100	100
Imazethapyr fb propanil (Super Wham) + Penetrator Plus (1 pt/A)	0.063 4.0	PPI PREFL	95	100	100	100	100	100	100
Imazethapyr fb propanil (Super Wham) + quinclorac + Penetrator Plus (1 pt/A)	0.063 2.0 0.125	PPi PREFL	94	100	100	100	100	100	100
Imazethapyr fb Imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI PREFL	94	100	100	100	100	100	100

continued

Table 28. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control						
			Broadleaf signalgrass (BRAPP)					Rice flatsedge (CYPIR)	
			5/15	5/29	6/15	7/6	7/27	5/15	5/29
	(lb/A)		(%)						
Imazethapyr fb	0.063	PPI							
propanil (Super Wham) +	2.0								
imazethapyr +	0.031								
Penetrator Plus (1 pt/A)		PREFL	95	100	100	100	100	100	100
Imazethapyr fb	0.063								
propanil (Super Wham) +	2.0								
triclopyr +	0.25								
Penetrator Plus (1 pt/A)		PREFL	94	100	100	100	100	100	100
Imazethapyr fb	0.063	PPI							
propanil (Super Wham) +	2.0								
carfentrazone +	0.02								
Penetrator Plus (1 pt/A)		PREFL	70	100	100	100	100	100	100
Imazethapyr	0.063	PRE	93	100	100	100	100	100	100
Imazethapyr fb	0.063	PRE							
propanil (Super Wham) +	4.0								
Penetrator Plus (1 pt/A)		PREFL	93	100	100	100	100	100	100
Imazethapyr fb	0.063	PRE							
propanil (Super Wham) +	2.0								
quinclorac +	0.125								
Penetrator Plus (1 pt/A)		PREFL	95	100	100	100	100	100	100
Imazethapyr fb	0.063	PRE							
imazethapyr +	0.063								
AG-98 (0.25%)		PREFL	95	100	100	100	100	100	100
Imazethapyr fb	0.063	PRE							
propanil (Super Wham) +	2.0								
imazethapyr +	0.031								
Penetrator Plus (1 pt/A)		PREFL	94	100	100	100	100	100	100

continued

Table 28. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control						
			Broadleaf signalgrass (BRAPP)					Rice flatsedge (CYPIR)	
			5/15	5/29	6/15	7/6	7/27	5/15	5/29
	(lb/A)		(%)						
Imazethapyr fb	0.063	PRE							
propanil (Super Wham) +	2.0								
triclopyr +	0.25								
Penetrator Plus (1 pt/A)		PREFL	93	100	100	100	100	100	100
Imazethapyr fb	0.063	PRE							
propanil (Super Wham) +	2.0								
carfentrazone +	0.02								
Penetrator Plus (1 pt/A)		PREFL	94	100	100	100	100	100	100
Imazethapyr	0.063	DPRE	98	100	100	100	100	100	100
Imazethapyr fb	0.063	DPRE							
propanil (Super Wham) +	4.0								
Penetrator Plus (1 pt/A)		PREFL	93	100	100	100	100	100	100
Imazethapyr fb	0.063	DPRE							
propanil (Super Wham) +	2.0								
quinclorac +	0.125								
Penetrator Plus (1 pt/A)		PREFL	94	100	100	100	100	100	100
Imazethapyr fb	0.063	DPRE							
imazethapyr +	0.063								
AG-98 (0.25%)		PREFL	94	100	100	100	100	100	100
Imazethapyr fb	0.063	DPRE							
propanil (Super Wham) +	2.0								
imazethapyr +	0.031								
Pentrator Plus (1 pt/A)		PREFL	94	100	100	100	100	100	100
Imazethapyr fb	0.063	DPRE							
propanil (Super Wham) +	2.0								
triclopyr +	0.25								
Penetrator Plus (0.25%)		PREFL	89	100	100	100	100	100	100

continued

Table 28. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/15	5/29	6/15	7/6	7/27	Rice flatsedge (CYPIR) 5/15	5/29
	(lb/A)		(%)						
Imazethapyr fb	0.063	DPRE							
propanil (Super Wham) +	2.0								
carfentrazone +	0.02								
Penetrator Plus (1 ptA)		PREFL	94	100	100	100	100	100	100
LSD (0.05)			13	0	7	16	13	0	0

continued

Table 28. Section 2.

Herbicide	Rate	Application timing	Carpetweed (MOLVE) control 5/29	Effect on rice: Injury 5/15	5/29	6/15	7/6	Heading 7/6	Yield
	(lb/A)		(%)						(lb/A)
Untreated check			0	0	0	0	0	53	1305
Propanil (Super Wham) +	4.0								
Penetrator Plus (1 pt/A)		PREFL	0	0	0	0	0	78	2655
Propanil (Super Wham) +	2.0								
quinclorac +	0.125								
Penetrator Plus (1 pt/A)		PREFL	0	0	0	0	0	79	2745
Imazethapyr +	0.063								
AG-98 (0.25%)		PREFL	0	0	0	0	0	58	2565
Propanil (Super Wham) +	2.0								
imazethapyr +	0.031								
Penetrator Plus (1 pt/A)		PREFL	0	0	0	0	0	64	3195
Propanil (Super wham) +	2.0								
triclopyr +	0.25								
Penetrator Plus (1 pt/A)		PREFL	0	0	0	11	0	66	2700

continued

Table 28. Section 2. Continued.

Herbicide	Rate	Application timing	Carpetweed (MOLVE) control	Effect on rice					
				Injury				Heading	
			5/29	5/15	5/29	6/15	7/6	7/6	Yield
	(lb/A)		(%)						(lb/A)
Propanil (Super Wham) + carfentrazone, 0.02	2.0								
Penetrator Plus (1 pt/A)		PREFL	0	0	0	3	0	55	2520
Imazethapyr	0.063	PPI	100	0	0	0	0	85	3150
Imazethapyr fb	0.063	PPI							
propanil (Super Wham) +	4.0								
Penetrator Plus (1 pt/A)		PREFL	100	0	0	0	0	78	3420
Imazethapyr fb	0.063	PPI							
propanil (Super Wham) +	2.0								
quinclorac +	0.125								
Penetrator Plus (1 pt/A)		PREFL	100	0	0	0	0	80	3420
Imazethapyr fb	0.063	PPI							
Imazethapyr +	0.063								
AG-98 (0.25%)		PREFL	100	0	0	5	0	66	3195
Imazethapyr fb	0.063	PPI							
propanil (Super Wham) +	2.0								
imazethapyr +	0.031								
Penetrator Plus (1 pt/A)		PREFL	100	0	0	0	0	86	3150
Imazethapyr fb	0.063								
propanil (Super Wham) +	2.0								
triclopyr +	0.25								
Penetrator Plus (1 pt/A)		PREFL	100	0	0	15	5	69	3285
Imazethapyr fb	0.063	PPI							
propanil (Super Wham) +	2.0								
carfentrazone +	0.02								
Penetrator Plus (1 pt/A)		PREFL	100	0	0	0	0	68	2970
Imazethapyr	0.063	PRE	100	0	0	0	0	78	3195
Imazethapyr fb	0.063	PRE							
propanil (Super Wham) +	4.0								
Penetrator Plus (1 pt/A)		PREFL	100	0	0	0	0	69	3555

continued

Table 28. Section 2. Continued.

Herbicide	Rate	Application timing	Carpetweed (MOLVE) control	Effect on rice					
				Injury				Heading	
			5/29	5/15	5/29	6/15	7/6	7/6	Yield
	(lb/A)		(%)						(lb/A)
Imazethapyr fb	0.063	PRE							
propanil (Super Wham) +	2.0								
quinclorac +	0.125								
Penetrator Plus (1 pt/A)		PREFL	100	0	0	0	0	65	3375
Imazethapyr fb	0.063	PRE							
imazethapyr +	0.063								
AG-98 (0.25%)		PREFL	100	0	0	0	0	53	3060
Imazethapyr fb	0.063	PRE							
propanil (Super Wham) +	2.0								
imazethapyr +	0.031								
Penetrator Plus (1 pt/A)		PREFL	100	0	0	0	0	63	3420
Imazethapyr fb	0.063	PRE							
propanil (Super Wham) +	2.0								
triclopyr +	0.25								
Penetrator Plus (1 pt/A)		PREFL	100	0	3	19	8	50	3465
Imazethapyr fb	0.063	PRE							
propanil (Super Wham) +	2.0								
carfentrazone +	0.02								
Penetrator Plus (1 pt/A)		PREFL	100	0	4	0	0	66	3510
Imazethapyr	0.063	DPRE	100	0	0	0	0	78	3060
Imazethapyr fb	0.063	DPRE							
propanil (Super Wham) +	4.0								
Penetrator Plus (1 pt/A)		PREFL	100	0	0	0	0	76	2970
Imazethapyr fb	0.063	DPRE							
propanil (Super Wham) +	2.0								
quinclorac +	0.125								
Penetrator Plus (1 pt/A)		PREFL	100	0	0	0	0	65	3555
Imazethapyr fb	0.063	DPRE							
imazethapyr +	0.063								
AG-98 (0.25%)		PREFL	100	0	0	0	0	70	2880

continued

Table 28. Section 2. Continued.

Herbicide	Rate	Application timing	Carpetweed (MOLVE) control	Effect on rice					
				Injury				Heading	
			5/29	5/15	5/29	6/15	7/6	7/6	Yield
	(lb/A)		(%)						(lb/A)
Imazethapyr fb	0.063	DPRE							
propanil (Super Wham) +	2.0								
imazethapyr +	0.031								
Pentrator Plus (1 pt/A)		PREFL	100	0	0	0	0	78	3150
Imazethapyr fb	0.063	DPRE							
propanil (Super Wham) +	2.0								
triclopyr +	0.25								
Penetrator Plus (0.25%)		PREFL	100	0	0	19	8	68	3420
Imazethapyr fb	0.063	DPRE							
propanil (Super Wham) +	2.0								
carfentrazone +	0.02								
Penetrator Plus (1 ptA)		PREFL	100	0	0	3	0	65	3330
LSD (0.05)			1	NS	NS	6	4	23	540

Table 29. DE-537 for rice weed control, Lonoke, 1998.

TEST INFORMATION

Location	Lonoke
Experimental Design / replications	RCB / 4
Plot size	10 ft by 20 ft
Row width / Number of rows per plot	7.5 in / 14 rows
Soil type	Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH	0.9 / 4.3
Planting date	May 1, 1998
Harvest date	August 5, 1998
Crop/Variety	Rice/Drew
Dates of Flushing	May 7, 14, and 20, 1998
Date of Flooding	June 2, 1998

Comments: 2-3 lf = 2-3 leaf rice; PREFL1 = first preflood; and PREFL2 = second preflood. Two preflood timings were used to avoid possible antagonism from tank-mixing grass and broadleaf herbicides. The DE-537 formulation is also referred to as XRM-5151.

Application type	2-3 lf	PREFL1	PREFL2
Date applied	May 20, 1998	June 1, 1998	June 1, 1998
Time	11:20 am	2:40 pm	3:05 pm
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	89/80	96/98	96/98
Relative humidity (%)	28	43	43
Wind (mph)	5	0	0
Weather	clear	clear	clear
Soil moisture	moist	moist	moist
Crop stage/Height	3 lf / 4.5"	1-2 tiller / 12"	1 tiller / 10"
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.)	20/6/20	24/6/20	22/6/20
Gpa / Psi	10/25	10/15	10/23
Weed species (density)	----------	(# leaves/height)	----------
BRAPP (15/ft^2)	2-5 lf / 2-3"	N/A	4 tiller / 10"
ECHCG (15/ft^2)	2-3 lf / 2"	N/A	6 lf / <1"

Conclusions: Broadleaf signalgrass pressure was severe. Also, the test area had natural barnyardgrass infestation and was seeded with two rows of propanil-resistant barnyardgrass across each plot. Bentazon + acifluorfen (Storm) at PREFL1, sprayed just ahead of the PREFL2 treatments, did not seem to reduce weed control. The DE-537 provided excellent control of barnyardgrass and broadleaf signalgrass.

Table 29. Section 1.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/27	6/16	7/2	7/27	8/28	Barnyardgrass (ECHCG) 5/27	8/28
	(lb/A)		(%)						
DE-537 +	0.187								
pendimethalin +	1.0								
Agri-Dex (1.25%) fb		2-3 lf							
(bentazon + acifluorfen)	0.75								
+ AG-98 (0.25%)		PREFL 1	94	94	100	99	98	98	100
(Bentazon + acifluorfen) +	0.75								
AG-98 (0.25%) fb		PREFL 1							
DE-537 +	0.187								
Agri-Dex (1.25%)		PREFL 2	0	81	87	95	93	81	88
(Bentazon + acifluorfen) +	0.75								
AG-98 (0.25%) fb		PREFL 1							
DE-537 +	0.25								
Agri-Dex (1.25%)		PREFL 2	0	84	90	98	95	84	93
DE-537 +	0.125								
Agri-Dex (1.25%) fb		2-3 lf							
(bentazon + acifluorfen)	0.75								
+ AG-98 (0.25%) fb		PREFL 1							
DE-537 +	0.125								
Agri-Dex (1.25%)		PREFL 2	93	93	100	99	100	99	100
DE-537 +	0.187								
Agri-Dex (1.25%) fb		2-3 lf							
(bentazon + acifluorfen)	0.75								
+ AG-98 (0.25%) fb		PREFL 1							
DE-537 +	0.187								
Agri-Dex (1.25%)		PREFL 2	93	96	100	100	100	98	99

continued

Table 29. Section 1.

Herbicide	Rate	Application timing	Weed control						
			Broadleaf signalgrass (BRAPP)					Barnyardgrass (ECHCG)	
			5/27	6/16	7/2	7/27	8/28	5/27	8/28
	(lb/A)		(%)						
Propanil (Super Wham) + Penetrator Plus (1 pt/A) fb (bentazon + acifluorfen) + AG-98 (0.25%) fb propanil (Super Wham) + Penetrator Plus (1 pt/A)	3.0 0.75 3.0	PREFL1 PREFL2	93	95	95	95	100	84	98
Fenoxaprop fb (bentazon + acifluorfen) + AG-98 (0.25%) fb fenoxaprop	0.063 0.75 0.063	2-3 lf PREFL1 PREFL2	100	96	100	100	100	100	100
Propanil (Super Wham) + quinclorac + Penetrator Plus (1 pt/A) fb (bentazon + acifluorfen) + AG-98 (0.25%)	2.0 0.125 0.75	2-3 lf PREFL1	98	98	100	99	100	100	100
LSD (0.05)			4	5	5	4	5	6	7

continued

Table 29. Section 2.

Herbicide	Rate	Application timing	Effect on rice: Injury 5/27	7/2	7/27	8/28	Yield
	(lb/A)		(%)				(lb/A)
DE-537 +	0.187						
pendimethalin +	1.0						
Agri-Dex (1.25%) fb		2-3 lf					
(bentazon + acifluorfen)	0.75						
+ AG-98 (0.25%)		PREFL 1	0	0	0	0	5220
(Bentazon + acifluorfen) +	0.75						
AG-98 (0.25%) fb		PREFL 1					
DE-537 +	0.187						
Agri-Dex (1.25%)		PREFL 2	0	0	0	0	5400
(Bentazon + acifluorfen) +	0.75						
AG-98 (0.25%) fb		PREFL 1					
DE-537 +	0.25						
Agri-Dex (1.25%)		PREFL 2	0	0	0	0	5445
DE-537 +	0.125						
Agri-Dex (1.25%) fb		2-3 lf					
(bentazon + acifluorfen) +	0.75						
AG-98 (0.25%) fb		PREFL 1					
DE-537 +	0.125						
Agri-Dex (1.25%)		PREFL 2	0	0	0	0	5310
DE-537 +	0.187						
Agri-Dex (1.25%) fb		2-3 lf					
(bentazon + acifluorfen) +	0.75						
AG-98 (0.25%) fb		PREFL 1					
DE-537 +	0.187						
Agri-Dex (1.25%)		PREFL 2	0	0	0	0	5040

continued

Table 29. Section 2. Continued.

Herbicide	Rate	Application timing	Effect on rice				
			Injury				
			5/27	7/2	7/27	8/28	Yield
	(lb/A)		----------(%)----------				(lb/A)
Propanil (Super Wham) + Penetrator Plus (1 pt/A) fb (bentazon + acifluorfen) + AG-98 (0.25%) fb propanil (Super Wham) + Penetrator Plus (1 pt/A)	3.0 0.75 3.0	PREFL 1 PREFL 2	0	0	0	0	5040
Fenoxaprop fb (bentazon + acifluorfen) + AG-98 (0.25%) fb fenoxaprop	0.063 0.75 0.063	2-3 lf PREFL 1 PREFL 2	9	0	0	0	5040
Propanil (Super Wham) + quinclorac + Penetrator Plus (1 pt/A) fb (bentazon + acifluorfen) + AG-98 (0.25%)	2.0 0.125 0.75	2-3 lf PREFL 1	0	0	0	0	5040
LSD (0.05)			3	NS	NS	NS	NS

Table 30. V-10029 for weed control in rice, Lonoke, 1998.

TEST INFORMATION

Location ..... Lonoke
Experimental Design / replications ..... RCB / 4
Plot size ..... 10 ft by 20 ft
Row width / Number of rows per plot ..... 7.5 in / 14 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.9 / 4.3

Planting date ..... May 1, 1998
Harvest date ..... September 3, 1998
Crop/Variety ..... Rice/Drew
Dates of Flushing ..... May 7, 14, and 20, 1998
Date of Flooding ..... June 2, 1998

Comments: DPRE = delayed preemergence; 2-3 lf = 2-3 leaf rice; 4 lf = 4 leaf rice; PREFL = preflood; and POFL = postflood. GR = granular formulation of molinate.

Application type	DPRE	2-3 lf	4 lf	PREFL	POFL
Date applied	May 4, 1998	May 19, 1998	May 22, 1998	June 1, 1998	June 9, 1998
Time	5:30 pm	12:55 pm	9:50 am	10:45 am	11:00 am
Incorporation equipment	N/A	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	82/82	96/84	91/80	86/88	92/75
Relative humidity (%)	37	35	68	47	61
Wind (mph)	2	3	6	4	7.5
Weather	clear	clear	clear	clear	cloudy
Soil moisture	moist	moist	moist	moist	flooded
Crop stage/Height	N/A	3 lf / 5"	4-5 lf / 6"	1-2 tiller / 12"	1-2 tiller / 12"
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.)	18/6/20	20/6/20	20/6/20	24.5/6/20	26/6/20
Gpa / Psi	10/21	10/20	10/20.5	10/23	10/27
Weed species (density)	----------	----------	(# leaves/height)	----------	----------
BRAPP (20/ft^2)	N/A	4-5 lf / 2-3"	2-3 lf / 0.5-1"	2 lf / 3"	2-3 tiller / 6-8"
Propanil-resistant ECHCG (25/row ft)	N/A	3 lf / 2"	4-5 lf / 4"	6-7 lf / 5"	N/A
MOLVE (10/ft^2)	N/A	N/A	4 lf / 2"	4-8 lf / 3-6"	N/A

Conclusions: V-10029 provided outstanding control of barnyardgrass but poor control of broadleaf signalgrass. The addition of quinclorac or pendimethalin DPRE controlled broadleaf signalgrass. Weed control and rice yields in the study were excellent.

Table 30. Section 1.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/15	5/29	6/16	7/2	7/27	8/27	Propanil-resistant barnyardgrass (ECHCG) 5/15	5/29	6/16	7/2	7/27	8/27
	(lb/A)		(%)											
Untreated check			1	0	5	0	0	0	16	0	5	0	0	0
Quinclorac +	0.188													
Kinetic (0.25%)		DPRE	83	91	95	93	98	100	81	83	95	91	93	98
Quinclorac +	0.188													
Kinetic (0.25%) fb		DPRE												
V-10029 +	0.018													
Kinetic (0.125%)		PREFL	83	85	95	93	99	100	81	79	95	95	100	100
Quinclorac +	0.188													
Kinetic (0.25%) fb		DPRE												
V-10029 +	0.02													
Kinetic (0.125%)		PREFL	84	91	95	96	100	100	81	83	95	95	100	100
Quinclorac +	0.188													
Kinetic (0.25%) fb														
(propanil + molinate)	6.0	PREFL	85	88	95	94	100	100	81	80	95	95	99	99
Quinclorac +	0.188													
Kinetic (0.25%) fb		DPRE												
V-10029 +	0.02													
Kinetic (0.125%) fb		4 lf												
triclopyr +	0.28													
AG-98 (0.25%)		POFL	88	93	95	95	100	100	86	90	95	94	100	100
Quinclorac +	0.188	DPRE												
Kinetic (0.25%) fb														
(propanil + molinate)	4.5	4 lf												
fb triclopyr +	0.28													
AG-98 (0.25%)		POFL	84	90	95	93	100	100	78	85	95	93	100	100
Pendimethalin fb	1.0	DPRE												
V-10029 +	0.018													
Kinetic (0.125%)		4 lf	93	89	95	84	100	99	93	91	94	93	100	100

continued

Table 30. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/15	5/29	6/16	7/2	7/27	8/27	Propanil-resistant barnyardgrass (ECHCG) 5/15	5/29	6/16	7/2	7/27	8/27
	(lb/A)		(%)											
Pendimethalin fb	1.0	DPRE												
V-10029 +	0.02													
Kinetic (0.125%)		4 lf	71	70	86	71	100	100	73	74	81	71	100	100
Pendimethalin fb	1.0	DPRE												
(propanil + molinate)	4.5	4 lf	94	94	94	93	100	99	96	94	95	95	100	100
Thiobencarb fb	3.0	DPRE												
V-10029 +	0.018													
Kinetic (0.125%)		4 lf	81	75	94	88	95	98	81	90	95	94	100	100
Thiobencarb fb	3.0	DPRE												
(propanil + molinate)	4.5	4-lf	81	91	95	95	100	100	84	94	95	95	100	100
Thiobencarb +	2.0													
propanil (Stam M-4)	3.0	2-3 lf												
fb thiobencarb +	2.0													
V-10029 +	0.02													
Kinetic (0.125%)		4 lf	0	85	95	95	95	100	20	75	95	96	100	100
Thiobencarb +	2.0													
propanil (Stam M-4)	3.0	2-3 lf												
fb thiobencarb +	2.0													
propanil (Stam M-4)	3.0	4 lf	0	86	94	91	100	100	6	55	78	83	61	23
Pendimethalin fb	1.0	DPRE												
V-10029 +	0.02													
Kinetic (0.125%)		POFL	91	88	94	94	99	96	93	91	93	95	99	100
Pendimethalin fb	1.0	DPRE												
molinate (15 GR)	4.0	POFL	93	85	95	85	98	70	96	93	95	95	100	100
Pendimethalin fb	1.0	DPRE												
V-10029 +	0.02													
triclopyr +	0.28													
Kinetic (0.125%)		POFL	68	85	73	91	99	90	75	91	95	96	100	100

continued

Table 30. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/15	5/29	6/16	7/2	7/27	8/27	Propanil-resistant barnyardgrass (ECHCG) 5/15	5/29	6/16	7/2	7/27	8/27
	(lb/A)		(%)											
Pendimethalin fb molinate (15 GR) + triclopyr	1.0 4.0 0.28	DPRE POFL	91	86	91	90	98	94	94	93	94	95	100	100
LSD(0.05)			23	14	16	17	5	16	26	15	13	16	10	15

continued

Table 30. Section 2.

Herbicide	Rate	Application timing	Carpetweed (MOLVE) control 5/29	Effect on rice: Injury 5/15	5/29	7/2	7/27	8/27	Yield
	(lb/A)		(%)						(lb/A)
Untreated check			0	1	0	0	0	0	2430
Quinclorac + Kinetic (0.25%)	0.188	DPRE	18	0	0	0	1	0	7965
Quinclorac + Kinetic (0.25%) fb V-10029 + Kinetic (0.125%)	0.188 0.018	DPRE PREFL	23	0	0	0	3	0	7110
Quinclorac + Kinetic (0.25%) fb V-10029 + Kinetic (0.125%)	0.188 0.02	DPRE PREFL	20	0	0	0	3	0	7020
Quinclorac + Kinetic (0.25%) fb (propanil + molinate)	0.188 6.0	 PREFL	13	0	0	0	1	0	6975

continued

Table 30. Section 2.

Herbicide	Rate	Application timing	Carpetweed (MOLVE) control	Effect on rice					
				Injury					
			5/29	5/15	5/29	7/2	7/27	8/27	Yield
	(lb/A)		----------(%)----------						(lbA)
Quinclorac +	0.188								
Kinetic (0.25%) fb		DPRE							
V-10029 +	0.02								
Kinetic (0.125%) fb		4 lf							
triclopyr +	0.28								
AG-98 (0.25%)		POFL	81	0	3	1	5	0	6975
Quinclorac +	0.188	DPRE							
Kinetic (0.25%) fb									
(propanil + molinate)	4.5	4 lf							
fb triclopyr +	0.28								
AG-98 (0.25%)		POFL	93	0	3	0	8	0	6930
Pendimethalin fb	1.0	DPRE							
V-10029 +	0.018								
Kinetic (0.125%)		4 lf	93	0	0	0	4	0	6840
Pendimethalin fb	1.0	DPRE							
V-10029 +	0.02								
Kinetic (0.125%)		4 lf	75	0	0	0	25	0	6840
Pendimethalin fb	1.0	DPRE							
(propanil + molinate)	4.5	4 lf	70	0	24	0	1	0	7470
Thiobencarb fb	3.0	DPRE							
V-10029 +	0.018								
Kinetic (0.125%)		4 lf	93	0	0	1	0	0	7155
Thiobencarb fb	3.0	DPRE							
(propanil + molinate)	4.5	4-lf	95	0	0	0	1	0	7200
Thiobencarb +	2.0								
propanil (Stam M-4)	3.0	2-3 lf							
fb thiobencarb +	2.0								
V-10029 +	0.02								
Kinetic (0.125%)		4 lf	95	0	6	1	3	0	6970

continued

Table 30. Section 2. Continued.

Herbicide	Rate	Application timing	Carpetweed (MOLVE) control	Effect on rice					
				Injury					
			5/29	5/15	5/29	7/2	7/27	8/27	Yield
	(lb/A)		----------(%)----------						(lbA)
Thiobencarb +	2.0								
propanil (Stam M-4)	3.0	2-3 lf							
fb thiobencarb +	2.0								
propanil (Stam M-4)	3.0	4 lf	94	0	15	0	1	0	6975
Pendimethalin fb	1.0	DPRE							
V-10029 +	0.02								
Kinetic (0.125%)		POFL	95	0	0	0	0	0	7560
Pendimethalin fb	1.0	DPRE							
molinate (15 GR)	4.0	POFL	94	0	0	1	1	0	6930
Pendimethalin fb	1.0	DPRE							
V-10029 +	0.02								
triclopyr +	0.28								
Kinetic (0.125%)		POFL	94	0	0	0	23	0	7605
Pendimethalin fb	1.0	DPRE							
molinate (15 GR) +	4.0								
triclopyr	0.28	POFL	95	0	0	3	1	0	7020
LSD(0.05)			31	NS	NS	NS	NS	NS	675

Table 31. Salvage treatments for grass control in rice, Lonoke, 1998.

TEST INFORMATION

Location ..... Lonoke
Experimental Design / replications ..... RCB / 4
Plot size ..... 10 ft by 20 ft
Row width / Number of rows per plot ..... 7.5 in / 14 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.9 / 4.3

Planting date ..... May 4, 1998
Harvest date ..... September 3, 1998
Crop/Variety ..... Rice/Drew
Dates of Flushing ..... May 7, 14, and 20, 1998
Date of Flooding ..... June 2, 1998

Comments: PREFL = preflood.

Application type	PREFL
Date applied	June 2, 1998
Time	8:00 pm
Incorporation equipment	N/A
Air/Soil temperature (F)	94 / 98
Relative humidity (%)	46
Wind (mph)	2
Weather	clear
Soil moisture	dry
Crop stage/Height	4 lf / 10"
Sprayer type/mph	BkPkCO_2 / 3
Nozzle type/Size	Driftguard / TT110015
Boom ht / # Noz / Spacing (in.)	25 / 6 / 20
Gpa / Psi	10 / 24
Weed species (density)	---------- (# leaves/height) ----------
BRAPP (16/ft^2)	2 lf - 2 tiller / 0.5-7"
MOLVE (30/ft^2)	5-7 lf / <1"

Conclusions: Several treatments were evaluated for PREFL salvage grass control. No prior treatments were applied and the grass infestation was solid. Several of the propanil (Super Wham) + quinclorac (Facet) treatments provided excellent control. There was no difference in control between the regular fenoxaprop (Whip) and the safened formulation. Both provided excellent grass control.

Table 31.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 6/18	7/2	7/27	8/28	Barnyardgrass (ECHCG) 7/27	8/28	Effect on rice: Injury 6/18	7/2	7/27	Yield
	(lb/A)		(%)									(lb/A)
Untreated check			0	0	0	0	0	0	0	0	0	2160
Quinclorac + Agri-Dex (1%)	0.093	PREFL	78	64	80	83	86	100	0	0	0	3735
Quinclorac + Agri-Dex (1%)	0.125	PREFL	74	65	83	73	93	96	0	0	0	3870
Quinclorac + Agri-Dex (1%)	0.25	PREFL	86	92	96	95	96	100	0	0	0	4140
Quinclorac + Agri-Dex (1%)	0.5	PREFL	90	100	100	98	100	100	0	0	0	3915
Propanil (Super Wham) + Penetrator Plus (0.25%)	4.0	PREFL	71	54	39	23	18	48	0	0	0	3420
Propanil (Super Wham) + Penetrator Plus (0.25%)	6.0	PREFL	78	56	61	35	35	36	0	0	0	3870
Propanil (Super Wham) + quinclorac + Penetrator Plus (0.25%)	2.0 + 0.125	PREFL	86	79	84	83	83	86	0	0	0	3870
Propanil (Super Wham) + quinclorac + Penetrator Plus (0.25%)	2.0 + 0.25	PREFL	90	91	93	86	75	89	0	0	0	3915
Propanil (Super Wham) + quinclorac + Penetrator Plus (0.25%)	4.0 + 0.125	PREFL	89	89	85	88	81	88	0	0	0	3915

continued

Table 31. Continued.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 6/18	7/2	7/27	8/28	Barnyardgrass (ECHCG) 7/27	8/28	Effect on rice Injury 6/18	7/2	7/27	Yield
	(lb/A)		----------(%)----------									(lb/A)
Propanil (Super Wham) + quinclorac + Penetrator Plus (0.25%)	4.0 0.25	PREFL	95	96	86	95	90	93	0	0	0	3420
Fenoxaprop	0.067	PREFL	0	0	100	100	89	89	0	0	0	4860
AEF046360	0.133	PREFL	0	0	100	95	51	79	0	0	0	4815
LSD (0.05)			7	15	24	17	28	19	NS	NS	NS	675

Table 32. Weed control in glufosinate (Liberty)-tolerant rice, Lonoke, 1998.

TEST INFORMATION

Location	Lonoke
Experimental Design / replications	RCB / 4
Plot size	10 ft by 20 ft
Row width / Number of rows per plot	7 in / 9 rows
Soil type	Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH	0.9 / 4.3
Planting date	May 3, 1998
Harvest date	September 3, 1998
Crop/Variety	Rice/Drew
Dates of Flushing	May 7, 14, and 20, 1998
Date of Flooding	June 2, 1998

Comments: DPRE = delayed preemergence; 2-3 lf = 2-3 leaf rice; PREFL = preflood; and POFL = postflood.

Application type	DPRE	2-3 lf	PREFL	POFL
Date applied	May 5, 1998	May 20, 1998	June 2, 1998	June 9, 1998
Time	10:05 am	9:45 am	7:30 pm	11:20 am
Incorporation equipment	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	82 / 68	87 / 76	94 / 98	92 / 75
Relative humidity (%)	52	53	46	61
Wind (mph)	0	4.5	4.5	8
Weather	cloudy	clear	clear	cloudy
Soil moisture	moist	moist	dry	flooded
Crop stage/Height	N/A	3 lf / 4.5"	4 lf / 6 "	2-3 tiller / 12"
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.)	18 / 6 / 20	20 / 6 / 20	25 / 6 / 20	26 / 6 / 20
Gpa / Psi	10 / 21	10 / 25	10 / 24	10 / 25
Weed species (density)	----------	----------	(# leaves/height)	----------
BRAPP (35/ft^2)	N/A	2-3 lf / 0.5-1"	6 lf - 2 tiller / 7"	2-3 tiller / 6-8"
Propanil-resistant ECHCG (40/row ft)	N/A	N/A	N/A	1-2 tiller / 6-8"

Conclusions: No injury was observed with any treatment at this location. Glufosinate (Liberty) provided excellent control of barnyardgrass and broadleaf signalgrass with all rates at the 2-3 lf, PREFL, and sequential timings. POFL treatments applied alone provided poor control of these weeds. Yields were also excellent in the sequentially applied treatments due to the suppression of reinfestations of broadleaf signalgrass.

Table 32. Section 1.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/15	5/27	6/18	7/27	8/27	Propanil-resistant barnyardgrass (ECHCG) 5/15	5/27	6/18	7/27
	(lb/A)		(%)								
Untreated check			0	0	0	0	0	0	0	0	0
Glufosinate	0.25	2-3 lf	0	91	100	74	73	0	95	91	44
Glufosinate	0.375	2-3 lf	0	95	100	95	89	0	95	89	80
Glufosinate	0.5	2-3 lf	0	95	100	99	91	0	97	95	81
Glufosinate	0.75	2-3 lf	0	97	100	100	96	0	94	100	98
Glufosinate	0.25	PREFL	0	0	84	85	73	0	0	68	36
Glufosinate	0.375	PREFL	0	0	90	98	88	0	0	84	96
Glufosinate	0.5	PREFL	0	0	90	98	90	0	0	74	94
Glufosinate	0.75	PREFL	0	0	92	100	97	0	0	87	100
Glufosinate	0.25	POFL	0	0	51	38	64	0	0	46	35
Glufosinate	0.375	POFL	0	0	68	45	63	0	0	63	28
Glufosinate	0.5	POFL	0	0	68	45	59	0	0	63	33
Glufosinate	0.75	POFL	0	0	71	54	61	0	0	65	55
Glufosinate fb	0.25	2-3 lf									
glufosinate	0.25	PREFL	0	94	100	99	99	0	93	99	96
Glufosinate fb	0.375	2-3 lf									
glufosinate	0.375	PREFL	0	98	98	96	96	0	96	93	100
Glufosinate fb	0.5	2-3 lf									
glufosinate	0.5	PREFL	0	97	100	96	99	0	95	100	94
Glufosinate fb	0.375	2-3 lf									
glufosinate	0.375	POFL	0	97	100	96	90	0	95	99	91
Glufosinate fb	0.5	2-3 lf									
glufosinate	0.5	POFL	0	97	100	100	98	0	95	100	100
Glufosinate +	0.25										
propanil (Stam M-4)	2.0	2-3 lf									
fb glufosinate +	0.25										
propanil (Stam M-4)	2.0	PREFL	0	98	100	100	100	0	96	99	100
Propanil (Stam M-4) fb	3.0	2-3 lf									
propanil (Stam M-4)	3.0	PREFL	0	55	95	85	81	0	20	0	0

continued

Table 32. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/15	5/27	6/18	7/27	8/27	Propanil-resistant barnyardgrass (ECHCG) 5/15	5/27	6/18	7/27
	(lb/A)		(%)								
Propanil (Stam M-4) fb glufosinate	3.0 0.375	2-3lf PREFL	0	64	100	100	98	0	20	81	88
Propanil (Stam M-4) fb glufosinate	3.0 0.5	2-3lf PREFL	0	63	100	100	95	0	14	89	93
Propanil (Stam M-4) fb glufosinate	3.0 0.5	2-3lf POFL	0	64	77	54	59	0	20	73	18
Propanil (Stam M-4) fb glufosinate	3.0 0.75	2-3lf POFL	0	54	81	50	61	0	13	75	45
Quinclorac + pendimethalin fb glufosinate	0.188 1.0 0.5	DPRE PREFL	90	100	100	100	100	95	100	100	99
Pendimethalin fb glufosinate	1.0 0.5	DPRE PREFL	76	68	100	100	99	91	100	98	100
Glufosinate + quinclorac	0.375 0.25	2-3lf	0	99	100	100	99	0	96	100	100
Glufosinate + thiobencarb	0.5 3.0	2-3lf	0	98	100	100	91	0	95	98	99
Glufosinate + thiobencarb fb glufosinate	0.375 3.0 0.375	2-3lf POFL	0	98	100	99	95	93	100	100	98
Quinclorac + pendimethalin fb (propanil + molinate) + bensulfuron	0.188 1.0 4.5 0.063	DPRE PREFL	91	100	100	100	100	93	100	100	98
LSD (0.05)			3	6	5	10	8	1	4	13	16

continued

Table 32. Section 2.

Herbicide	Rate	Application timing	Carpetweed (MOLVE) control	Effect on rice					
				Injury					
			5/27	5/15	5/27	6/18	7/27	8/27	Yield
	(lb/A)		(%)						(lb/A)
Untreated check			0	0	0	0	0	0	1080
Glufosinate	0.25	2-3 lf	100	0	1	0	0	0	5625
Glufosinate	0.375	2-3 lf	100	0	4	0	0	0	5940
Glufosinate	0.5	2-3 lf	100	0	4	0	0	0	5535
Glufosinate	0.75	2-3 lf	100	0	5	0	0	0	5895
Glufosinate	0.25	PREFL	0	0	0	0	0	0	5085
Glufosinate	0.375	PREFL	0	0	0	0	0	0	5355
Glufosinate	0.5	PREFL	0	0	0	0	0	0	4905
Glufosinate	0.75	PREFL	0	0	0	0	0	0	4950
Glufosinate	0.25	POFL	0	0	0	0	0	5	2430
Glufosinate	0.375	POFL	0	0	0	0	0	1	2610
Glufosinate	0.5	POFL	0	0	0	0	0	1	3060
Glufosinate	0.75	POFL	0	0	0	0	0	8	3555
Glufosinate fb	0.25	2-3 lf							
glufosinate	0.25	PREFL	100	0	4	0	0	0	5265
Glufosinate fb	0.375	2-3 lf							
glufosinate	0.375	PREFL	100	0	3	0	0	0	5760
Glufosinate fb	0.5	2-3 lf							
glufosinate	0.5	PREFL	100	0	5	0	0	0	5850
Glufosinate fb	0.375	2-3 lf							
glufosinate	0.375	POFL	100	0	3	0	0	0	5895
Glufosinate fb	0.5	2-3 lf							
glufosinate	0.5	POFL	100	0	5	0	0	0	5580
Glufosinate +	0.25								
propanil (Stam M-4)	2.0	2-3 lf							
fb glufosinate +	0.25								
propanil (Stam M-4)	2.0	PREFL	100	0	3	0	0	0	5625
Propanil (Stam M-4) fb	3.0	2-3 lf							
propanil (Stam M-4)	3.0	PREFL	99	0	3	0	0	0	4995

continued

Table 32. Section 2. Continued.

Herbicide	Rate	Application timing	Carpetweed (MOLVE) control	Effect on rice					
				Injury					
			5/27	5/15	5/27	6/18	7/27	8/27	Yield
	(lb/A)			(%)					(lb/A)
Propanil (Stam M-4) fb glufosinate	3.0 0.375	2-3lf PREFL	99	0	3	0	0	0	5490
Propanil (Stam M-4) fb glufosinate	3.0 0.5	2-3lf PREFL	98	0	3	0	0	0	5355
Propanil (Stam M-4) fb glufosinate	3.0 0.5	2-3lf POFL	100	0	3	0	0	3	4230
Propanil (Stam M-4) fb glufosinate	3.0 0.75	2-3lf POFL	100	0	4	0	0	0	4590
Quinclorac + pendimethalin fb glufosinate	0.188 1.0 0.5	DPRE PREFL	100	0	0	0	0	0	5670
Pendimethalin fb glufosinate	1.0 0.5	DPRE PREFL	100	0	0	0	0	0	5715
Glufosinate + quinclorac	0.375 0.25	2-3lf	100	0	4	0	0	0	5490
Glufosinate + thiobencarb	0.5 3.0	2-3lf	100	0	6	0	0	0	5580
Glufosinate + thiobencarb fb glufosinate	0.375 3.0 0.375	2-3lf POFL	100	0	5	0	0	0	5715
Quinclorac + pendimethalin fb (propanil + molinate) + bensulfuron	0.188 1.0 4.5 0.063	DPRE PREFL	100	0	0	0	0	0	5715
LSD (0.05)			1	NS	3	NS	NS	2	630

Table 33. Imazethapyr follow crop study: IMI-rice followed by wheat and non-IMI rice, Lonoke, 1998, (year of establishment).

TEST INFORMATION

Location ..... Lonoke
Experimental Design / replications ..... RCB / 4
Plot size ..... 20 ft by 20 ft
Row width / Number of rows per plot ..... 7.5 in / 28 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.9 / 4.3

Planting date ..... May 1, 1998
Harvest date ..... August 10, 1998
Crop/Variety Rice/93AS3510
Dates of Flushing ..... May 7, 14, and 20, 1998
Date of Flooding ..... June 2, 1998

Comments: PPI = preplant incorporated; PRE = preemergence; DPRE = delayed preemergence; EPOST = early postemergence; PREFL = preflood; and POFL = postflood. The current labeled rate for imazethapyr is 0.125 lb/A.

Application type	PPI	PRE	DPRE	EPOST	PREFL	POFL
Date applied	May 1, 1998	May 2, 1998	May 4, 1998	May 18, 1998	June 1, 1998	June 8, 1998
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	78/78	84/84	98/86	87/88	81/74
Relative humidity (%)	52	49	41	40	57	78
Wind (mph)	5	0	2	5	2.5	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 (density)	----------	----------	----------	(# leaves/height)	----------	----------
BRAPP (30/ft^2)	N/A	N/A	N/A	3 lf / 2"	2 tiller / 6"	tillered / 13"
MOLVE (20/ft^2)	N/A	N/A	N/A	4 lf / 0.125"	N/A	N/A

Conclusions: There has been little research on the degradation of imazethapyr in the soil under flooded rice field conditions. Since imazethapyr has a four-month rotational crop restriction for wheat and an 18-month rotational crop restriction for oats and rice on the current label, there is concern about the possible carryover problems to rotational crops.

All soil-applied treatments of imazethapyr provided 100% control of broadleaf signalgrass and rice flatsedge. Significant injury to rice resulted from the EPOST and PREFL treatments. POFL applications were not effective.

Wheat and oats will be planted on one half of each plot after rice harvest in the fall of 1998. Crop emergence dates, injury, and yields will be taken on the wheat and oats. Non-IMI-tolerant rice will be planted on the other half of each plot in 1999. Crop injury and yields will also be taken on the non-IMI rice.

Table 33. Section 1.

			Weed control						
			Broadleaf signalgrass (BRAPP)					Barnyardgrass (ECHCG)	Eclipta (ECLAL)
Herbicide	Rate	Application timing	5/15	5/27	6/16	7/6	7/27	7/6	7/27
	(lb/A)		(%)						
Untreated check			0	0	0	0	0	0	0
Imazethapyr	0.063	PPI	86	90	100	100	85	100	85
Imazethapyr	0.125	PPI	91	99	100	100	100	100	100
Imazethapyr	0.063	PRE	84	81	100	100	85	100	85
Imazethapyr	0.125	PRE	91	93	100	100	100	100	96
Imazethapyr	0.063	DPRE	75	84	100	100	95	100	100
Imazethapyr	0.125	DPRE	84	94	100	100	99	100	100
Imazethapyr + AG-98 (0.25%)	0.063	EPOST	0	69	100	100	98	100	0
Imazethapyr + AG-98 (0.25%)	0.125	EPOST	0	75	100	100	100	100	58
Imazethapyr + AG-98 (0.25%)	0.063	PREFL	0	0	76	30	39	53	35
Imazethapyr + AG-98 (0.25%)	0.125	PREFL	0	0	79	48	51	55	45
Imazethapyr + AG-98 (0.25%)	0.125	POFL	0	0	31	50	38	53	13
Imazethapyr fb imazethapyr + AG-98 (0.25%)	0.063 0.063	PPI PREFL	88	94	100	100	100	100	90
Imazethapyr fb imazethapyr + AG-98 (0.25%)	0.125 0.125	PRE PREFL	94	96	100	100	100	100	94

continued

Table 33. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/15	5/27	6/16	7/6	7/27	Barnyardgrass (ECHCG) 7/6	Eclipta (ECLAL) 7/27
	(lb/A)		(%)						
Imazethapyr fb	0.063	DPRE							
imazethapyr +	0.063								
AG-98 (0.25%)		PREFL	84	86	100	100	100	100	85
Imazethapyr fb	0.125	DPRE							
imazethapyr +	0.125								
AG-98 (0.25%)		PREFL	86	95	100	100	100	100	100
LSD (0.05)			6	9	8	12	16	15	26

continued

Table 33. Section 2.

Herbicide	Rate	Application timing	Carpetweed (MOLVE) control 5/27	Effect on rice: Rice injury 5/15	5/27	6/16	7/6	7/27	Heading 7/6	Yield
	(lb/A)		(%)							(lb/A)
Untreated check			0	0	0	0	0	0	34	1170
Imazethapyr	0.063	PPI	0	0	4	5	4	0	66	4005
Imazethapyr	0.125	PPI	0	1	6	8	8	0	53	4230
Imazethapyr	0.063	PRE	0	0	0	5	3	0	69	4005
Imazethapyr	0.125	PRE	0	3	5	16	13	0	54	3960
Imazethapyr	0.063	DPRE	0	0	0	0	0	0	81	4410
Imazethapyr	0.125	DPRE	0	1	3	6	9	0	55	3915
Imazethapyr +	0.063									
AG-98 (0.25%)		EPOST	5	0	25	19	16	0	34	3870
Imazethapyr +	0.125									
AG-98 (0.25%)		EPOST	5	0	25	30	28	0	14	4050

continued

Table 33. Section 2. Continued.

Herbicide	Rate	Application timing	Carpetweed (MOLVE) control	Effect on rice						
				Rice injury					Heading	
			5/27	5/15	5/27	6/16	7/6	7/27	7/6	Yield
	(lb/A)		(%)							(lb/A)
Imazethapyr+	0.063									
AG-98 (0.25%)		PREFL	0	0	0	18	35	0	13	2790
Imazethapyr+	0.125									
AG-98 (0.25%)		PREFL	0	0	0	28	43	0	11	3015
Imazethapyr+	0.125									
AG-98 (0.25%)		POFL	0	0	0	5	45	0	14	2115
Imazethapyr fb	0.063	PPI								
imazethapyr+	0.063									
AG-98 (0.25%)		PREFL	0	0	0	10	9	0	59	3870
Imazethapyr fb	0.125	PRE								
imazethapyr+	0.125									
AG-98 (0.25%)		PREFL	0	5	3	25	18	0	41	3555
Imazethapyr fb	0.063	DPRE								
imazethapyr+	0.063									
AG-98 (0.25%)		PREFL	0	3	0	0	0	0	64	3690
Imazethapyr fb	0.125	DPRE								
imazethapyr+	0.125									
AG-98 (0.25%)		PREFL	0	0	5	14	15	0	41	4320
LSD (0.05)			NS	3	5	14	18	NS	25	810

Table 34. Clomazone (Command)/quinclorac (Facet) in drill vs. broadcast seeding for weed control in rice, Lonoke, 1998.

TEST INFORMATION

Location ..... Lonoke
Experimental Design / replications ..... RCB / 4
Plot size ..... 10 ft by 20 ft
Row width / Number of rows per plot ..... 7.5 in / 14 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.9 / 4.3

Planting date ..... May 21, 1998
Harvest date ..... September 3, 1998
Crop/Variety ..... Rice/Drew
Dates of Flushing ..... May 7, 14, and 20, 1998
Date of Flooding ..... June 2, 1998

Comments: PPI = preplant incorporated; 2-3 lf = 2-3 leaf rice; and PREFL = preflood.

Application type	PPI	2-3 lf	PREFL
Date applied	May 2, 1998	May 19, 1998	June 1, 1998
Time	10:45 am	1:20 pm	12:30 pm
Incorporation equipment	Field cultivator	N/A	N/A
Air/Soil temperature (F)	79/70	94/84	86/88
Relative humidity (%)	52	42	47
Wind (mph)	0	3	5
Weather	clear	clear	mostly clear
Soil moisture	moist	moist	moist
Crop stage/Height	N/A	3 lf / 4.5"	1-2 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.)	18/6/20	20/6/20	24/6/20
Gpa / Psi	10/21	10/22	10/17
Weed species (density)	----------	(# leaves/height)	----------
CYPIR (30/ft^2)	N/A	3 lf / 0.25"	4-6 lf / 6"
BRAPP 20/ft^2)	N/A	4 lf / 4"	6 lf / 6"

Conclusions: This study was conducted to compare the effects of PPI treatments of clomazone and quinclorac in drill-seeded and broadcast-seeded rice. In the drill-seeded plots, the treatments were sprayed and then were incorporated using two passes with a field cultivator, and the rice was drilled into the plots at 105 lb/A. In the broadcast-seeded plots, the rice was dropped on the soil surface at a 120-lb/A seeding rate, the herbicides were sprayed on top of the seed, and both were incorporated using two passes with a field cultivator. Weed control was generally good, except for some rice flatsedge in the clomazone treatments. The crop injury ratings were initially higher in the broadcast-seeded rice with clomazone and the higher rates of quinclorac. The yield differences between the standard (propanil fb propanil) and clomazone and quinclorac were also greater in the broadcast-seeded plots.

Table 34. Section 1.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/15	5/29	6/18	7/2	7/27	8/27	Rice flatsedge (CYPIR) 5/15	5/29	7/2	7/27
	(lb/A)		(%)									
DRILL-SEEDED RICE:												
Propanil (Stam M-4) fb	4.0	2-3 lf										
propanil (Stam M-4)	4.0	PREFL	0	87	98	95	95	98	0	60	93	98
Clomazone fb	0.3	PPI										
propanil (Stam M-4)	4.0	PREFL	93	95	98	93	95	100	92	0	52	50
Clomazone fb	0.4	PPI										
propanil (Stam M-4)	4.0	PREFL	93	95	97	93	95	100	92	0	32	35
Quinclorac fb	0.25	PPI										
propanil (Stam (M-4)	4.0	PREFL	95	95	100	93	95	100	95	85	93	95
Quinclorac fb	0.375	PPI										
propanil (Stam M-4)	4.0	PREFL	95	95	100	95	95	100	97	92	95	95
BROADCAST-SEEDED RICE:												
Propanil (Stam M-4) fb	4.0	2-3 lf										
propanil (Stam M-4)	4.0	PREFL	0	93	100	93	97	100	0	57	87	95
Clomazone fb	0.3	PPI										
propanil (Stam M-4)	4.0	PREFL	95	95	98	95	95	100	93	0	32	32
Clomazone fb	0.4	PPI										
propanil (Stam M-4)	4.0	PREFL	93	95	98	93	95	100	95	0	63	95
Quinclorac fb	0.25	PPI										
propanil (Stam (M-4)	4.0	PREFL	95	95	100	95	95	100	95	90	93	95
Quinclorac fb	0.375	PPI										
propanil (Stam M-4)	4.0	PREFL	95	95	100	93	95	100	95	90	93	95
LSD (0.05)			3	5	NS	NS	NS	NS	3	8	NS	NS

continued

Table 34. Section 2.

Herbicide	Rate	Application timing	Barnyardgrass (ECHCG) control		Effect on rice						
					Rice injury						
			7/2	8/27	5/15	5/29	6/18	7/2	7/27	8/27	Yield
	(lb/A)		----------(%)----------								(lb/A)
DRILL-SEEDED RICE:											
Propanil (Stam M-4) fb	4.0	2-3 lf									
propanil (Stam M-4)	4.0	PREFL	95	100	0	0	0	0	12	0	5130
Clomazone fb	0.3	PPI									
propanil (Stam M-4)	4.0	PREFL	95	100	37	30	13	2	15	0	5085
Clomazone fb	0.4	PPI									
propanil (Stam M-4)	4.0	PREFL	93	100	50	48	23	0	28	3	4410
Quinclorac fb	0.25	PPI									
propanil (Stam (M-4)	4.0	PREFL	95	100	0	3	3	0	13	0	5220
Quinclorac fb	0.375	PPI									
propanil (Stam M-4)	4.0	PREFL	95	100	0	13	12	0	18	0	4815
BROADCAST-SEEDED RICE:											
Propanil (Stam M-4) fb	4.0	2-3 lf									
propanil (Stam M-4)	4.0	PREFL	95	100	0	0	0	0	3	0	5400
Clomazone fb	0.3	PPI									
propanil (Stam M-4)	4.0	PREFL	95	100	88	42	13	5	10	0	4725
Clomazone fb	0.4	PPI									
propanil (Stam M-4)	4.0	PREFL	95	100	90	53	25	0	23	0	4500
Quinclorac fb	0.25	PPI									
propanil (Stam (M-4)	4.0	PREFL	95	100	0	25	17	0	13	0	4860
Quinclorac fb	0.375	PPI									
propanil (Stam M-4)	4.0	PREFL	95	100	0	28	35	3	27	0	4320
LSD (0.05)			NS	NS	8	18	14	NS	14	2	450

Table 35. Clomazone (Command)/propanil (Stam) sequentials in rice weed control, Lonoke, 1998.

TEST INFORMATION

Location	Lonoke
Experimental Design / replications	RCB / 4
Plot size	10 ft by 20 ft
Row width / Number of rows per plot	7.5 in / 14 rows
Soil type	Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH	0.9 / 4.3
Planting date	May 2, 1998
Harvest date	September 4, 1998
Crop/Variety	Rice/Drew
Dates of Flushing	May 7, 14, and 20, 1998
Date of Flooding	June 2, 1998

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

Application type	PRE	DPRE	2-3lf
Date applied	May 2, 1998	May 5, 1998	May 19, 1998
Time	4:45 pm	9:50 am	2:10 pm
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	81 / 77	80 / 68	97 / 84
Relative humidity (%)	46	51	40
Wind (mph)	2	0	6
Weather	clear	cloudy	clear
Soil moisture	moist	moist	moist
Crop stage/Height	N/A	N/A	3lf / 4.5"
Sprayer type/mph	BkPkCO$_2$ / 3	BkPkCO$_2$ / 3	BkPkCO$_2$ / 3
Nozzle type/Size	Driftguard / TT110015	Driftguard / TT110015	Driftguard / TT110015
Boom ht / # Noz / Spacing (in.)	18 / 6 / 20	18 / 6 / 20	20 / 6 / 20
Gpa / Psi	10 / 21	10 / 21	10 / 20
Weed species (density)	----------	(# leaves/height)	----------
SEBEX (2/ft^2)	N/A	2lf / 2"	N/A
BRAPP (15/ft^2)	N/A	2lf / 2"	4-5lf / 4"
MOLVE (6/ft^2)	N/A	4lf / 0.125"	N/A
IPOSP 2/ft^2)	N/A	cot.-2lf / 1-2"	N/A

Conclusions: This study was conducted to evaluate sequential treatments following either clomazone (Command) PRE or a reduced rate of quinclorac and pendimethalin DPRE. Both soil-applied systems usually require follow-up treatments for sedge and broadleaf weed control. The study was overseeded with broadleaf weeds. Most of the combination programs resulted in excellent weed control and rice yields.

Table 35. Section 1.

Herbicide	Rate	Application timing	Weed control											
			Broadleaf signalgrass (BRAPP)						Hemp sesbania (SEBEX)					
			5/12	6/1	6/16	7/2	7/27	8/27	5/12	6/1	6/16	7/2	7/27	8/27
	(lb/A)		(%)											
Untreated check			1	13	18	23	25	21	0	0	21	20	23	21
Clomazone	0.4	PRE	100	100	94	91	100	100	10	0	64	54	73	39
Clomazone fb	0.4	PRE												
propanil (Stam 80 DF)	3.0													
+ AG-98 (0.25%)		2-3 lf	100	100	95	94	100	100	8	85	94	91	96	86
Clomazone fb	0.4	PRE												
propanil (Stam 80 DF)	3.0													
+ clomazone +	0.2													
AG-98 (0.25%)		2-3 lf	100	100	95	95	100	100	5	94	95	93	96	88
Clomazone fb	0.4	PRE												
propanil (Stam 80 DF)	3.0													
+ quinclorac +	0.12													
AG-98 (0.25%)		2-3 lf	100	100	95	95	100	100	3	99	95	94	100	100
Clomazone fb	0.4													
propanil (Stam 80 DF)	3.0													
+ quinclorac +	0.25													
AG-98 (0.25%)		2-3 lf	100	100	95	94	100	100	4	89	95	95	100	95
Clomazone fb	0.4	PRE												
propanil (Stam 80 DF)	3.0													
+ pendimethalin +	1.0													
AG-98 (0.25%)		2-3 lf	100	100	95	95	100	100	10	84	94	95	99	89
Quinclorac +	0.188													
pendimethalin	1.0	DPRE	95	100	95	95	100	100	51	98	95	95	100	98
Quinclorac +	0.188													
pendimethalin fb	1.0	DPRE												
propanil (Stam 80 Df)	3.0													
+ AG-98 (0.25%)		2-3 lf	75	100	95	95	100	100	48	100	95	95	100	100

continued

Table 35. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/12	6/1	6/16	7/2	7/27	8/27	Hemp sesbania (SEBEX) 5/12	6/1	6/16	7/2	7/27	8/27
	(lb/A)		(%)											
Quinclorac + pendimethalin fb propanil (Stam 80 DF) + clomazone + AG-98 (0.25%)	0.188 1.0 3.0 0.2	DPRE 2-3 lf	89	100	95	95	100	100	73	97	95	95	100	98
Quinclorac + pendimethalin fb propanil (Stam 80 DF) + quinclorac + AG-98 (0.25%)	0.188 1.0 3.0 0.12	DPRE 2-3 lf	80	100	95	91	100	100	46	100	95	95	100	100
Quinclorac + pendimethalin fb propanil (Stam 80 DF) + quinclorac + AG-98 (0.25%)	0.188 1.0 3.0 0.25	DPRE 2-3 lf	96	100	95	95	100	100	51	100	95	95	100	100
Quinclorac + pendimethalin fb propanil (Stam 80 DF) + pendimethalin + AG-98 (0.25%)	0.188 1.0 3.0 1.0	DPRE 2-3 lf	86	100	95	95	100	100	49	100	95	95	100	100
Clomazone fb propanil (Stam 80 DF) + bensulfuron + AG-98 (0.25%)	0.4 3.0 0.03	2-3 lf	100	100	95	95	100	100	23	90	95	5	100	94
LSD (0.05)			18	10	14	18	19	16	30	15	21	22	22	22

continued

Table 35. Section 2.

Herbicide	Rate	Application timing	Weed control: Morningglory (IPOSP) 5/12	Weed control: Morningglory (IPOSP) 6/1	Weed control: Carpetweed (MOLVE) 6/1	Effect on rice: Injury 5/12	Effect on rice: Injury 6/1	Effect on rice: Injury 6/16	Effect on rice: Injury 7/2	Effect on rice: Injury 7/27	Yield
	(lb/A)		(%)								(lb/A)
Untreated check			0	0	0	3	0	0	0	0	3420
Clomazone	0.4	PRE	4	13	13	51	10	11	6	0	5490
Clomazone fb	0.4	PRE									
propanil (Stam 80 DF)	3.0										
+ AG-98 (0.25%)		2-3 lf	3	13	96	54	14	11	8	0	5985
Clomazone fb	0.4	PRE									
propanil (Stam 80 DF)	3.0										
+ clomazone +	0.2										
AG-98 (0.25%)		2-3 lf	69	61	98	41	14	10	3	0	6030
Clomazone fb	0.4	PRE									
propanil (Stam 80 DF)	3.0										
+ quinclorac +	0.12										
AG-98 (0.25%)		2-3 lf	1	88	96	46	20	11	6	0	5940
Clomazone fb	0.4										
propanil (Stam 80 DF)	3.0										
+ quinclorac +	0.25										
AG-98 (0.25%)		2-3 lf	1	85	90	44	11	9	5	0	6165
Clomazone fb	0.4	PRE									
propanil (Stam 80 DF)	3.0										
+ pendimethalin +	1.0										
AG-98 (0.25%)		2-3 lf	4	56	100	40	10	4	4	0	6300
Quinclorac +	0.188										
pendimethalin	1.0	DPRE	99	100	100	0	8	1	3	0	5760
Quinclorac +	0.188										
pendimethalin fb	1.0	DPRE									
propanil (Stam 80 Df)	3.0										
+ AG-98 (0.25%)		2-3 lf	95	100	100	0	8	1	3	0	6570

continued

Table 35. Section 2. Continued.

Herbicide	Rate	Application timing	Weed control: Morningglory (IPOSP) 5/12	Weed control: Morningglory (IPOSP) 6/1	Weed control: Carpetweed (MOLVE) 6/1	Effect on rice: Injury 5/12	Effect on rice: Injury 6/1	Effect on rice: Injury 6/16	Effect on rice: Injury 7/2	Effect on rice: Injury 7/27	Yield
	(lb/A)		----------(%)----------								(lb/A)
Quinclorac +	0.188										
pendimethalin fb	1.0	DPRE									
propanil (Stam 80 DF)	3.0										
+ clomazone +	0.2										
AG-98 (0.25%)		2-3 lf	95	100	100	0	8	1	1	0	5985
Quinclorac +	0.188										
pendimethalin fb	1.0	DPRE									
propanil (Stam 80 DF)	3.0										
+ quinclorac +	0.12										
AG-98 (0.25%)		2-3 lf	95	100	100	0	9	1	0	0	5625
Quinclorac +	0.188										
pendimethalin fb	1.0	DPRE									
propanil (Stam 80 DF)	3.0										
+ quinclorac +	0.25										
AG-98 (0.25%)		2-3 lf	100	100	100	0	9	4	9	0	5625
Quinclorac +	0.188										
pendimethalin fb	1.0	DPRE									
propanil (Stam 80 DF)	3.0										
+ pendimethalin +	1.0										
AG-98 (0.25%)		2-3 lf	98	100	100	0	8	3	6	0	6120
Clomazone fb	0.4										
propanil (Stam 80 DF)	3.0										
+ bensulfuron +	0.03										
AG-98 (0.25%)		2-3 lf	5	58	98	43	10	1	0	0	6210
LSD (0.05)			17	35	10	19	NS	NS	NS	NS	945

Table 36. Propanil (Stam) combinations for annual grass control in rice, Lonoke, 1998.

TEST INFORMATION

Location ..... Lonoke
Experimental Design / replications ..... RCB / 4
Plot size ..... 10 ft by 20 ft
Row width / Number of rows per plot ..... 7.5 in / 14 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.9 / 4.3

Planting date ..... May 2, 1998
Harvest date ..... September 5, 1998
Crop/Variety ..... Rice/Drew
Dates of Flushing ..... May 7, 14, and 20, 1998
Date of Flooding ..... June 2, 1998

Comments: 2-3 lf = 2-3 leaf rice; and PREFL = preflood.

Application type	2-3 lf	PREFL
Date applied	May 20, 1998	June 1, 1998
Time	10:50 am	3:30 pm
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	88 / 80	92 / 98
Relative humidity (%)	59	43
Wind (mph)	5	1.5
Weather	clear	clear
Soil moisture	moist	moist
Crop stage/Height	3 lf / 4.5"	1-2 tiller / 11"
Sprayer type/mph	Bk Pk CO_2 / 3	Bk Pk CO_2 / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	20 / 6 / 20	23 / 6 / 20
Gpa / Psi	10 / 25	10 / 23
Weed species (density)	---------- (# leaves/height) ----------	
BRAPP (20/ft^2)	cot.-5 lf / 2"	5 lf / 4"
MOLVE (15/ft^2)	cot.-4 lf / 0.125"	1 runner / 0.5"

Conclusions: Most treatments in the study provided excellent control in a heavy infestation of barnyardgrass and broadleaf signalgrass. The tank-mix single and sequential applications provided the best overall control.

Table 36. Section 1.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/27	6/16	7/2	7/27	8/28	Carpetweed (MOLVE) 5/27
	(lb/A)		(%)					
Untreated check			0	0	0	0	0	0
Propanil (Stam M-4)	4.0	2-3 lf	93	94	91	100	86	100
Propanil (Stam 80 DF) + AG-98 (0.25%)	4.0	2-3 lf	81	68	90	88	78	100
Propanil (Super Wham) + Penetrator Plus (1 pt/A)	4.0	2-3 lf	87	86	91	98	84	100
(Propanil + molinate)	6.0	2-3 lf	90	90	100	98	96	100
Propanil (Stam M-4) fb propanil (Stam M-4)	3.0 3.0	2-3 lf PREFL	88	95	100	100	99	100
Propanil (Stam 80 DF) + AG-98 (0.25%) fb propanil (Stam 80 DF) + AG-98 (0.25%)	3.0 3.0	2-3 lf PREFL	78	76	96	93	89	100
Propanil (Super Wham) + Penetrator Plus (1 pt/A) fb propanil (Super Wham) + Penetrator Plus (1 pt/A)	3.0 3.0	2-3 lf PREFL	85	95	100	100	100	100
(Propanil + molinate) fb (propanil + molinate)	4.5 4.5	2-3 lf PREFL	84	95	100	100	100	100
Propanil (Stam M-4) + thiobencarb	3.0 3.0	2-3 lf	91	81	100	94	94	100
Propanil (Stam 80 DF) + thiobencarb + AG-98 (0.25%)	3.0 3.0	2-3 lf	86	86	100	88	88	100
Propanil (Stam 80 DF) + pendimethalin + AG-98 (0.25%)	3.0 1.0	2-3 lf	85	79	100	96	84	100

continued

Table 36. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/27	6/16	7/2	7/27	8/28	Carpetweed (MOLVE) 5/27
	(lb/A)		(%)					
Propanil (Stam 80 DF) + quinclorac + AG-98 (0.25%)	3.0 0.125	2-3 lf	97	95	100	100	100	100
Propanil (Stam M-4) + quinclorac	3.0 0.125	2-3 lf	93	94	100	100	100	100
Propanil (Stam M-4) + quinclorac	3.0 0.25	2-3 lf	98	94	100	100	100	100
Propanil (Stam M-4) + clomazone	3.0 0.4	2-3 lf	99	94	100	100	99	100
Propanil (Stam M-4) + clomazone + AG-98 (0.25%)	3.0 0.4	2-3 lf	96	95	100	100	100	100
Quinclorac + AG-98 (0.25%)	0.125	2-3 lf	55	91	100	88	85	0
Quinclorac + AG-98 (0.25%)	0.25	2-3 lf	66	91	100	100	98	0
LSD (0.05)			9	14	6	10	12	1

continued

Table 36. Section 2.

Herbicide	Rate	Application timing	Barnyardgrass (ECHCG) control 7/27	8/28	Effect on rice: Injury 5/27	7/2	7/27	8/28	Yield
	(lb/A)		(%)						(lb/A)
Untreated check			0	0	0	0	0	0	2340
Propanil (Stam M-4)	4.0	2-3 lf	46	83	9	0	0	0	5490

continued

Table 36. Section 2. Continued.

Herbicide	Rate	Application timing	Barnyardgrass (ECHCG) control 7/27	Barnyardgrass (ECHCG) control 8/28	Effect on rice Injury 5/27	Effect on rice Injury 7/2	Effect on rice Injury 7/27	Effect on rice Injury 8/28	Yield
	(lb/A)		(%)						(lb/A)
Propanil (Stam 80 DF) + AG-98 (0.25%)	4.0	2-3 lf	56	79	0	0	0	0	5400
Propanil (Super Wham) + Penetrator Plus (1 pt/A)	4.0	2-3 lf	59	80	9	0	0	0	5400
(Propanil + molinate)	6.0	2-3 lf	94	95	5	0	0	0	5850
Propanil (Stam M-4) fb propanil (Stam M-4)	3.0 3.0	2-3 lf PREFL	94	96	5	0	0	0	5445
Propanil (Stam 80 DF) + AG-98 (0.25%) fb propanil (Stam 80 DF) + AG-98 (0.25%)	3.0 3.0	2-3 lf PREFL	80	85	1	0	0	0	5670
Propanil (Super Wham) + Penetrator Plus (1 pt/A) fb propanil (Super Wham) + Penetrator Plus (1 pt/A)	3.0 3.0	2-3 lf PREFL	98	98	8	0	0	0	5490
(Propanil + molinate) fb (propanil + molinate)	4.5 4.5	2-3 lf PREFL	100	100	6	0	0	0	5445
Propanil (Stam M-4) + thiobencarb	3.0 3.0	2-3 lf	96	98	13	0	0	0	5580
Propanil (Stam 80 DF) + thiobencarb + AG-98 (0.25%)	3.0 3.0	2-3 lf	100	95	6	0	0	0	5445
Propanil (Stam 80 DF) + pendimethalin + AG-98 (0.25%)	3.0 1.0	2-3 lf	95	96	4	0	0	0	5580
Propanil (Stam 80 DF) + quinclorac + AG-98 (0.25%)	3.0 0.125	2-3 lf	100	100	1	0	0	0	5220
Propanil (Stam M-4) + quinclorac	3.0 0.125	2-3 lf	100	100	5	0	0	0	5625

continued

Table 36. Section 2. Continued.

Herbicide	Rate	Application timing	Barnyardgrass (ECHCG) control		Effect on rice				
					Injury				
			7/27	8/28	5/27	7/2	7/27	8/28	Yield
	(lb/A)		----------	----------	----------	(%)	----------	----------	(lb/A)
Propanil (Stam M-4) + quinclorac	3.0 0.25	2-3 lf	100	100	5	0	0	0	5670
Propanil (Stam M-4) + clomazone	3.0 0.4	2-3 lf	100	98	28	0	0	0	5355
Propanil (Stam M-4) + clomazone + AG-98 (0.25%)	3.0 0.4	2-3 lf	100	100	18	1	0	0	5445
Quinclorac + AG-98 (0.25%)	0.125	2-3 lf	100	96	6	0	0	0	5175
Quinclorac + AG-98 (0.25%)	0.25	2-3 lf	100	99	6	1	0	0	5085
LSD (0.05)			26	10	8	NS	NS	NS	585

Table 37. Thiobencarb (Bolero) for weed control in rice, Lonoke, 1998.

TEST INFORMATION

Location ..... Lonoke
Experimental Design / replications ..... RCB / 4
Plot size ..... 10 ft by 20 ft
Row width / Number of rows per plot ..... 7.5 in / 14 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.9 / 4.3

Planting date ..... May 2, 1998
Harvest date ..... September 3, 1998
Crop/Variety ..... Rice/Drew
Dates of Flushing ..... May 7, 14, and 20, 1998
Date of Flooding ..... June 2, 1998

Comments: DPRE = delayed preemergence; 2-3 lf = 2-3 leaf rice; PREFL = preflood; and POFL = postflood.

Application type	DPRE	2-3 lf	PREFL	POFL
Date applied	May 5, 1998	May 19, 1998	June 1, 1998	June 9, 1998
Time	10:45 am	1:30 pm	11:00 am	11:20 am
Incorporation equipment	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	75/68	94/84	86/88	92/75
Relative humidity (%)	67	42	47	61
Wind (mph)	2	3	4.5	7
Weather	mostly cloudy	clear	clear	cloudy
Soil moisture	moist	moist	moist	flooded
Crop stage/Height	N/A	3 lf / 4.5"	1-2 tiller / 12"	1-2 tiller / 12"
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.)	18/6/20	20/6/20	24/6/20	26/6/20
Gpa / Psi	10/21	10/20	10/23	10/27
Weed species (density)	----------	(# leaves/height)	----------	
BRAPP (50/ft^2)	N/A	3 lf / 2"	2 lf / 3"	2-3 tiller / 6-8"
Propanil-resistant ECHCG (40/row ft)	N/A	2 lf / 2"	N/A	N/A

Conclusions: The study had a heavy population of broadleaf signalgrass and propanil-resistant barnyardgrass. DPRE treatments containing quinclorac provided good weed control. In general, lower yields were produced in the combination treatment programs.

Table 37. Section 1.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/15	6/2	6/16	7/2	7/27	8/27	Propanil-resistant barnyardgrass (ECHCG) 5/15	6/2	6/16	7/2	8/27
	(lb/A)		(%)										
Untreated check			0	0	0	5	0	0	0	0	0	10	0
Thiobencarb +	2.0												
quinclorac fb	0.188	DPRE											
thiobencarb +	2.0												
propanil (Stam M-4)	3.0	PREFL	88	90	93	95	100	100	89	98	95	95	100
Thiobencarb +	3.0												
pendimethalin	1.0	DPRE	83	25	70	66	83	71	94	98	85	88	100
Thiobencarb +	4.0												
pendimethalin	1.0	DPRE	84	25	78	80	88	74	93	96	90	89	100
Thiobencarb +	2.0												
pendimethalin fb	1.0	DPRE											
thiobencarb +	2.0												
propanil (Stam M-4)	3.0	2-3 lf	78	76	90	94	100	98	94	98	94	94	100
Thiobencarb +	3.0												
(propanil + molinate)	4.5	2-3 lf	0	28	81	70	90	80	0	53	89	80	100
Thiobencarb +	2.0												
pendimethalin fb	1.0	DPRE											
thiobencarb +	2.0												
(propanil + molinate)	4.5	PREFL	73	43	93	95	100	100	93	90	98	94	100
Thiobencarb +	2.0												
quinclorac fb	0.188	DPRE											
thiobencarb +	2.0												
(propanil + molinate)	4.5	2-3 lf	83	94	88	94	100	100	85	99	95	95	100
Thiobencarb +	2.0												
quinclorac	0.188	DPRE	89	91	89	95	100	100	91	98	95	93	100
Thiobencarb +	3.0												
(propanil + molinate) fb	2.0	2-3 lf											
thiobencarb +	2.0												
propanil (Stam M-4)	3.0	PREFL	0	30	94	94	100	100	0	76	98	94	98

continued

Table 37. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/15	6/2	6/16	7/2	7/27	8/27	Propanil-resistant barnyardgrass (ECHCG) 5/15	6/2	6/16	7/2	8/27
	(lb/A)		(%)										
Pendimethalin fb	1.0	DPRE											
thiobencarb +	3.0												
(propanil + molinate)	4.5	2-3 lf	61	69	85	91	98	94	83	98	93	91	100
Pendimethalin fb	1.0	DPRE											
thiobencarb +	2.0												
(propanil + molinate) fb	4.5	2-3 lf											
thiobencarb +	2.0												
bensulfuron	0.028	POFL	81	66	91	93	100	99	88	98	95	94	100
Quinclorac +	0.188												
pendimethalin fb	1.0	DPRE											
(propanil + molinate)	4.5	2-3 lf	91	95	91	95	100	100	95	96	95	95	100
Pendimethalin +	1.0												
quinclorac	0.188	DPRE	95	95	91	95	100	100	95	98	95	95	100
(Propanil + molinate) fb	4.5	2-3 lf											
(propanil + molinate)	4.5	PREFL	0	40	91	81	100	100	0	65	90	81	75
LSD (0.05)			13	18	9	19	11	15	4	13	7	14	18

continued

Table 37. Section 2.

Herbicide	Rate (lb/A)	Application timing	Effect on rice: Injury 5/15	6/2	6/16	7/2	7/27	Yield (lb/A)
			(%)					
Untreated check			0	0	1	0	0	2565
Thiobencarb +	2.0							
quinclorac fb	0.188	DPRE						
thiobencarb +	2.0							
propanil (Stam M-4)	3.0	PREFL	1	3	5	11	0	4860
Thiobencarb +	3.0							
pendimethalin	1.0	DPRE	0	0	3	3	0	4950
Thiobencarb +	4.0							
pendimethalin	1.0	DPRE	0	0	0	3	0	5625
Thiobencarb +	2.0							
pendimethalin fb	1.0	DPRE						
thiobencarb +	2.0							
propanil (Stam M-4)	3.0	2-3 lf	0	1	5	3	0	5535
Thiobencarb +	3.0							
(propanil + molinate)	4.5	2-3 lf	0	6	1	9	0	4680
Thiobencarb +	2.0							
pendimethalin fb	1.0	DPRE						
thiobencarb +	2.0							
(propanil + molinate)	4.5	PREFL	0	26	1	3	0	5220
Thiobencarb +	2.0							
quinclorac fb	0.188	DPRE						
thiobencarb +	2.0							
(propanil + molinate)	4.5	2-3 lf	0	4	0	5	0	5130
Thiobencarb +	2.0							
quinclorac	0.188	DPRE	0	5	10	16	0	4905
Thiobencarb +	3.0							
(propanil + molinate) fb	2.0	2-3 lf						
thiobencarb +	2.0							
propanil (Stam M-4)	3.0	PREFL	0	6	1	5	0	5175

continued

Table 37. Section 2. Continued.

Herbicide	Rate	Application timing	Effect on rice: Injury 5/15	6/2	6/16	7/2	7/27	Yield
	(lb/A)		(%)					(lb/A)
Pendimethalin fb	1.0	DPRE						
thiobencarb +	3.0							
(propanil + molinate)	4.5	2-3 lf	0	5	4	5	0	5995
Pendimethalin fb	1.0	DPRE						
thiobencarb +	2.0							
(propanil + molinate) fb	4.5	2-3 lf						
thiobencarb +	2.0							
bensulfuron	0.028	POFL	0	3	0	3	0	5220
Quinclorac +	0.188							
pendimethalin fb	1.0	DPRE						
(propanil + molinate)	4.5	2-3 lf	0	26	0	10	0	5085
Pendimethalin +	1.0							
quinclorac	0.188	DPRE	5	1	6	10	0	4590
(Propanil + molinate) fb	4.5	2-3 lf						
(propanil + molinate)	4.5	PREFL	0	3	3	0	0	5490
LSD (0.05)			NS	NS	NS	NS	NS	765

Table 38. Thiobencarb (Bolero) tank-mixes and sequential weed control programs, Rohwer, 1998.

TEST INFORMATION

Location ..... Rohwer
Experimental Design / replications ..... RCB / 4
Plot size ..... 4.5 ft by 20 ft
Row width / Number of rows per plot ..... 6.5 in / 9 rows
Soil type ..... Charkey clay loam (8% sand, 49% silt, 43% clay)
% OM / pH ..... 3.5 / 6.7

Planting date ..... May 7, 1998
Harvest date ..... September 17, 1998
Crop/Variety ..... Rice/Cypress
Dates of Flushing ..... May 12, 18, 21, and June 5, 1998
Date of Flooding ..... June 13, 1998

Comments: PRE = preemergence; DPRE = delayed preemergence; EPOST = early postemergence; MPOST = mid-postemergence; PREFL = preflood; and POFL = post-flood.

Application type	PRE	DPRE	EPOST	MPOST	PREFL	POFL
Date applied	May 8, 1998	May 13, 1998	May 27, 1998	June 3, 1998	June 9, 1998	June 24, 1998
Time	12:00 pm	5:00 pm	10:00 am	4:00 pm	5:00 pm	12:30 am
Incorporation equipment	N/A	N/A	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	88/80	92/82	82/78	92/97	95/100	100/92
Relative humidity (%)	43	84	72	63	55	45
Wind (mph)	3	5	4	5	5	3
Weather	clear	clear	mostly cloudy	mostly cloudy	partly cloudy	clear
Soil moisture	moist	wet	moist	dry	dry	flooded
Crop stage/Height	N/A	N/A	2-3 lf / 5"	3-4 lf / 6"	5-6 lf - 2 tiller / 7"	8-10 lf - 5 tiller/22"
Sprayer type/mph	BkPkCO_2 / 3	BkPkCO_2 / 3	BkPkCO_2 / 3	Hooded BM / 3	BkPkCO_2 / 3	BkPkCO_2 / 3
Nozzle type/Size	Teejet / XR11002	Teejet / XR11002	Teejet / XR11002	Teejet / XR11002	Teejet / TJ11002	Teejet / TJ11002
Boom ht / # Noz / Spacing (in.)	15/3/18	15/3/18	15/3/18	15/3/18	15/3/18	15/3/18
Gpa / Psi	15/24	15/24	15/24	15/22	15/24	15/23
Weed species (density)	----------	----------	---------- (# leaves/height)	----------	----------	----------
ECHCG (120/ft^2)	N/A	N/A	2-3 lf / 1-3"	3-4 lf / 2-4"	4-5 lf / 4-5"	4 tiller / 22"
SEBEX (5/ft^2)	N/A	N/A	Cot.-3 lf / 0.5-3.5"	3-4 lf / 2-5"	5-6 lf / 5-6"	11-14 lf / 30"
CYPES (1/ft^2)	N/A	2-3 lf / 3-4"	4-6 lf / 5-7"	6-7 lf / 6-9"	7-9 lf / -11"	10-12 lf / 22"
AESVI (7/ft^2)	N/A	N/A	N/A	N/A	N/A	2-3 tiller / 10"

Conclusions: The Rohwer location had a very dense population of barnyardgrass. Thiobencarb applied DPRE at 3 or 4 lb/A tank-mixed with 1 lb/A pendimethalin provided good control of barnyardgrass, but did not control hemp sesbania. When thiobencarb at 3 lb/A plus 3 lb/A propanil or 3 lb/A (propanil + molinate) was applied EPOST, good control of hemp sesbania was achieved, but barnyardgrass control was poor by the late-season rating.

Good to excellent season-long control of both weeds was provided by the remaining treatments. No injury was observed on rice except for initial burn from treatments containing propanil. Yields were influenced by weed control.

Table 38. Section 1.

Herbicide	Rate	Application timing	Weed control: Barnyardgrass (ECHCG) 5/26	6/3	6/17	6/24	7/8	Hemp sesbania (SEBEX) 5/26	6/3	6/17	6/24	7/8
	(lb/A)		(%)									
Untreated check			0	0	0	0	0	0	0	0	0	0
Thiobencarb + quinclorac fb	2.0 0.375	DPRE										
thiobencarb + propanil	2.0 3.0	MPOST	90	97	97	98	94	53	81	100	98	94
Thiobencarb + pendimethalin	3.0 1.0	DPRE	91	98	97	94	85	50	5	0	0	5
Thiobencarb + pendimethalin	4.0 1.0	DPRE	91	97	97	95	88	50	13	0	0	20
Thiobencarb + pendimethalin fb	2.0 1.0	DPRE										
thiobencarb + propanil	2.0 3.0	EPOST	93	97	97	91	88	59	95	100	96	90
Thiobencarb + propanil	3.0 3.0	EPOST	0	79	88	68	53	0	100	96	87	88
Thiobencarb + (propanil + molinate)	3.0 3.0	EPOST	0	73	84	76	58	0	97	91	90	84
Thiobencarb + pendimethalin fb	2.0 1.0	DPRE										
thiobencarb + (propanil + molinate)	2.0 3.0	PREFL	90	97	95	95	91	46	15	100	98	94

continued

Table 38. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control: Barnyardgrass (ECHCG) 5/26	6/3	6/17	6/24	7/8	Hemp sesbania (SEBEX) 5/26	6/3	6/17	6/24	7/8
	(lb/A)		(%)									
Thiobencarb + quinclorac fb thiobencarb + (propanil + molinate)	2.0 + 0.5 fb 2.0 + (3.0)	DPRE fb EPOST	90	98	98	97	94	50	96	90	83	85
Thiobencarb + quinclorac	2.0 + 0.5	DPRE	87	97	96	95	90	48	78	82	89	86
Thiobencarb + propanil fb thiobencarb + propanil	2.0 + 3.0 fb 2.0 + 3.0	EPOST fb PREFL	0	69	93	85	68	0	99	100	98	96
Thiobencarb + (propanil + molinate) fb thiobencarb + propanil	2.0 + (3.0) fb 2.0 + 3.0	EPOST fb PREFL	0	50	95	92	85	0	94	100	98	96
Pendimethalin fb thiobencarb + (propanil + molinate)	1.0 fb 3.0 + (4.5)	DPRE fb EPOST	81	99	98	98	95	43	100	100	98	96
Pendimethalin fb thiobencarb + (propanil + molinate) fb thiobencarb + bensulfuron	1.0 fb 2.0 + (4.5) fb 2.0 + 0.028	DPRE fb MPOST fb POFL	79	91	96	85	65	50	5	0	0	85
Thiobencarb + quinclorac fb thibencarb + propanil	2.0 + 0.375 fb 2.0 + 3.0	DPRE fb PREFL	86	96	98	96	93	48	69	100	98	95

continued

Table 38. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control: Barnyardgrass (ECHCG) 5/26	6/3	6/17	6/24	7/8	Hemp sesbania (SEBEX) 5/26	6/3	6/17	6/24	7/8
	(lb/A)		(%)									
Quinclorac + pendimethalin fb (propanil + molinate)	0.375 + 1.0 fb 4.5	DPRE MPOST	91	99	99	97	97	50	83	95	93	93
Pendimethalin fb quinclorac + propanil	1.0 fb 0.375 + 3.0	DPRE MPOST	80	91	93	96	84	50	3	100	98	94
LSD (0.05)			12	11	5	11	17	7	16	8	11	10

continued

Table 38. Section 2.

Herbicide	Rate	Application timing	Rice injury 5/26	6/3	6/17	6/24	7/8	Rice yield 9/17
	(lb/A)		(%)					(lb/A)
Untreated check			0	0	0	0	0	116
Thiobencarb + quinclorac fb thiobencarb + propanil	2.0 + 0.375 fb 2.0 + 3.0	DPRE MPOST	0	0	0	0	0	6859
Thiobencarb + pendimethalin	3.0 + 1.0	DPRE	0	0	0	0	0	2722
Thiobencarb + pendimethalin	4.0 + 1.0	DPRE	0	0	0	0	0	1575

continued

Table 38. Section 2. Continued.

Herbicide	Rate	Application timing	Rice injury 5/26	6/3	6/17	6/24	7/8	Rice yield 9/17
	(lb/A)		(%)					(lb/A)
Thiobencarb + pendimethalin fb thiobencarb + propanil	2.0 + 1.0 fb 2.0 + 3.0	DPRE fb EPOST	0	14	0	0	0	4754
Thiobencarb + propanil	3.0 + 3.0	EPOST	0	18	0	0	0	4693
Thiobencarb + (propanil + molinate)	3.0 + 3.0	EPOST	0	21	0	0	0	3660
Thiobencarb + pendimethalin fb thiobencarb + (propanil + molinate)	2.0 + 1.0 fb 2.0 + 3.0	DPRE fb PREFL	0	0	0	0	0	7026
Thiobencarb + quinclorac fb thiobencarb + (propanil + molinate)	2.0 + 0.5 fb 2.0 + 3.0	DPRE fb EPOST	0	13	0	0	0	6838
Thiobencarb + quinclorac	2.0 + 0.5	DPRE	0	0	0	0	0	5389
Thiobencarb + propanil fb thiobencarb + propanil	2.0 + 3.0 fb 2.0 + 3.0	EPOST fb PREFL	0	18	0	0	0	5412
Thiobencarb + (propanil + molinate) fb thiobencarb + propanil	2.0 + 3.0 fb 2.0 + 3.0	EPOST fb PREFL	0	20	0	0	0	5694

continued

Table 38. Section 2. Continued.

Herbicide	Rate	Application timing	Rice injury 5/26	6/3	6/17	6/24	7/8	Rice yield 9/17
	(lb/A)		----------	----------	(%)	----------	----------	(lb/A)
Pendimethalin fb thiobencarb + (propanil + molinate)	1.0 3.0 4.5	DPRE EPOST	0	23	0	0	0	7499
Pendimethalin fb thiobencarb + (propanil + molinate) fb thiobencarb + bensulfuron	1.0 2.0 4.5 2.0 0.028	DPRE MPOST POFL	0	0	0	0	0	3645
Thiobencarb + quinclorac fb thibencarb + propanil	2.0 0.375 2.0 3.0	DPRE PREFL	0	0	3	0	0	8140
Quinclorac + pendimethalin fb (propanil + molinate)	0.375 1.0 4.5	DPRE MPOST	0	0	0	0	0	6310
Pendimethalin fb quinclorac + propanil	1.0 0.375 3.0	DPRE MPOST	0	0	0	0	0	6244
LSD (0.05)			NS	7	1	NS	NS	861

Table 39. Carfentrazone (Shark) for weed control in rice, Lonoke, 1998.

TEST INFORMATION

Location ..... Lonoke
Experimental Design / replications ..... RCB / 4
Plot size ..... 10 ft by 20 ft
Row width / Number of rows per plot ..... 7.5 in / 14 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.9 / 4.3

Planting date ..... May 2, 1998
Harvest date ..... September 4, 1998
Crop/Variety ..... Rice/Drew
Dates of Flushing ..... May 7, 14, and 20, 1998
Date of Flooding ..... June 2, 1998

Comments: 3-4 lf = 4 leaf rice; and PREFL = preflood.

Application type	3-4 lf	PREFL
Date applied	May 27, 1998	June 1, 1998
Time	5:30 pm	4:00 pm
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	89 / 80	92 / 98
Relative humidity (%)	96	43
Wind (mph)	0	1.5
Weather	cloudy	clear
Soil moisture	wet	moist
Crop stage/Height	3-4 lf / 3"	1-2 tiller / 12"
Sprayer type/mph	BkPkCO_2 / 3	BkPkCO_2 / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	20 / 6 / 20	23 / 6 / 20
Gpa / Psi	10 / 20	10 / 23
Weed species (density)	---------- (# leaves/height) ----------	
BRAPP (20/ft^2)	4lf / 6-8"	2 lf-1 tiller / 2-6"
CYPES (2/ft^2)	N/A	3 lf / 3"

Conclusions: Preflood treatments of carfentrazone, alone or in various tank-mixtures, gave good to excellent control of broadleaf signalgrass and yellow nutsedge. Injury from carfentrazone was minimal. Propanil + triclopyr caused significantly higher injury and lower yield than carfentrazone.

Table 39.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 6/16	7/2	7/27	8/28	Yellow nutsedge (CYPES) 6/16	Effect on rice: Injury 6/16	7/2	7/27	Yield
	(lb/A)		(%)								(lb/A)
All plots were treated with fenoxaprop 0.045 at 3-4 lf:											
Check			95	99	100	100	86	0	0	0	4950
Carfentrazone +	0.02										
AG-98 (0.25%)		PREFL	95	100	100	100	89	0	0	0	4860
Carfentrazone +	0.02										
thiobencarb	4.0	PREFL	95	100	100	100	91	0	0	0	4725
Carfentrazone +	0.02										
quinclorac +	0.25										
AG-98 (0.25%)		PREFL	95	100	100	100	95	0	0	0	4410
Carfentrazone +	0.02										
pendimethalin	1.0	PREFL	95	100	100	100	93	0	0	0	4680
Carfentrazone +	0.02										
fenoxaprop	0.063	PREFL	95	100	100	100	95	3	4	0	4500
Propanil (Super Wham) +	3.0										
triclopyr +	0.25										
Penetrator Plus (1 pt/A)		PREFL	95	100	100	100	95	15	9	0	3915
Carfentrazone +	0.02										
propanil (Super Wham) +	3.0										
Penetrator Plus (1 pt/A)		PREFL	95	100	100	100	95	0	0	0	4860
Propanil (Super Wham) +	3.0										
Penetrator Plus (1 pt/A)		PREFL	95	100	100	100	93	3	0	0	4860
LSD (0.05)			NS	NS	NS	NS	4	6	NS	NS	630

Table 40. Tank-mix combinations with imazethapyr, Lonoke, 1998.

TEST INFORMATION

Location ..... Lonoke
Experimental Design / replications ..... RCB / 4
Plot size ..... 10 ft by 20 ft
Row width / Number of rows per plot ..... 7.5 in / 14 rows
Soil type ..... Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.9 / 4.3

Planting date ..... May 1, 1998
Harvest date ..... August 7, 1998
Crop/Variety Rice/93AS3510
Dates of Flushing ..... May 7, 14, and 20, 1998
Date of Flooding ..... June 2, 1998

Comments: EPOST = early postemergence.

Application type	EPOST
Date applied	May 18, 1998
Time	5:30 pm
Incorporation equipment	N/A
Air/Soil temperature (F)	95 / 84
Relative humidity (%)	43
Wind (mph)	3
Weather	mostly clear
Soil moisture	moist
Crop stage/Height	3 lf / 4"
Sprayer type/mph	BkPkCO_2 / 3
Nozzle type/Size	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	19 / 6 / 20
Gpa / Psi	10 / 20
Weed species (density)	(# leaves/height)
BRAPP (24/ft^2)	3 lf / 2"
CYPIR (170/ft^2)	3 lf / 0.5"
MOLVE (40/ft^2)	4 lf / 0.125"

Conclusions: This study was designed to compare several standard postemergence rice herbicide treatments alone and tank-mixed with imazethapyr. Treatments were applied to three-leaf rice. Broadleaf signalgrass also had three leaves. All imazethapyr tank-mix treatments provided 100% season-long broadleaf signalgrass control. No antagonism was noted with any treatment.

Table 40.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/29	6/17	7/9	7/27	Carpetweed (MOLVE) 5/29	Rice flatsedge (CYPIR) 5/29	Effect on rice: Injury 5/29	6/17	7/9	Heading 7/9	Yield
	(lb/A)		(%)										(lb/A)
Untreated check			0	0	5	0	0	0	0	0	0	33	1440
Propanil (Stam M-4) + AG-98 (0.25%)	3.0	EPOST	91	99	96	90	100	98	0	0	0	80	3240
Halosulfuron + AG-98 (0.25%)	0.047	EPOST	5	10	15	20	10	0	0	0	0	50	1440
(Propanil + molinate)	4.5	EPOST	89	96	95	86	100	100	0	0	0	79	3195
Propanil (Super Wham) + Penetrator Plus (1 pt/A)	3.0	EPOST	88	100	100	89	100	100	0	0	0	90	3240
Triclopyr + AG-98 (0.25%)	0.25	EPOST	8	0	13	10	10	0	3	0	3	35	990
Bensulfuron + AG-98 (0.25%)	0.06	EPOST	5	10	15	13	10	0	0	0	0	45	1260
Thiobencarb	3.0	EPOST	8	5	18	8	10	0	0	0	0	48	1530
Carfentrazone + AG-98 (0.25%)	0.02	EPOST	0	8	13	8	10	0	0	0	0	48	1710
Fenoxaprop	0.063	EPOST	94	100	100	98	45	53	33	3	3	69	3510
(Bentazon + acifluorfen) + AG-98 (0.25%)	0.75	EPOST	40	42	40	42	97	97	7	8	3	43	2475
Imazethapyr + AG-98 (0.25%)	0.063	EPOST	78	100	100	100	55	90	29	10	9	51	3465
Imazethapyr + propanil (Stam M-4) + AG-98 (0.25%)	0.063 3.0	EPOST	100	100	100	100	100	100	31	3	15	59	3555
Imazethapyr + halosulfuron + AG-98 (0.25%)	0.063 0.047	EPOST	73	100	100	100	40	90	28	4	6	70	3690
Imazethapyr + (propanil + molinate)	0.063 4.5	EPOST	100	100	100	100	100	100	35	13	13	46	3735

continued

Table 40. Continued.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/29	6/17	7/9	7/27	Carpetweed (MOLVE) 5/29	Rice flatsedge (CYPIR) 5/29	Effect on rice: Injury 5/29	6/17	7/9	Heading 7/9	Yield
	(lb/A)		----------(%)----------										(lb/A)
Imazethapyr + propanil (Super Wham) + Penetrator Plus (1 pt/A)	0.063 3.0	EPOST	100	100	100	100	100	100	33	8	6	53	3600
Imazethapyr + triclopyr + AG-98 (0.25%)	0.063 0.25	EPOST	78	100	100	100	69	93	24	8	0	54	3645
Imazethapyr + bensulfuron + AG-98 (0.25%)	0.063 0.06	EPOST	76	100	100	100	70	89	26	13	10	35	3015
Imazethapyr + thiobencarb	0.063 3.0	EPOST	83	100	100	100	80	91	33	15	9	25	3105
Imazethapyr + carfentrazone + AG-98 (0.25%)	0.063 0.02	EPOST	79	100	100	100	85	93	30	8	0	66	3330
Imazethapyr + fenoxaprop	0.063 0.063	EPOST	79	100	100	100	61	84	39	8	5	55	3285
Imazethapyr + (bentazon + acifluorfen) + AG-98 (0.25%)	0.063 0.75	EPOST	90	100	100	100	100	100	45	10	3	38	3510
LSD (0.05)			11	10	11	16	24	10	8	10	8	26	855

Table 41. Imazethapyr flush vs. no flush of soil-applied treatments, Lonoke, 1998.

TEST INFORMATION

Location	Lonoke
Experimental Design / replications	Split plot / 3
Plot size	10 ft by 95 ft
Row width / Number of rows per plot	7.5 in / 14 rows
Soil type	Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH	0.9 / 4.3
Planting date	May 1, 1998
Harvest date	August 7, 1998
Crop/Variety	IMI-tolerant Rice/93AS3510
Dates of Flushing	May 7, 14, and 20, 1998
Date of Flooding	June 2, 1998

Comments: PPI = preplant incorporated; PRE = preemergence; and EPOST = early postemergence. IMI tolerant = rice tolerant to imidazolinone herbicides. A non-IMI-tolerant commercial rice cultivar was planted to simulate red rice.

Application type	PPI	PRE	EPOST
Date applied	May 1, 1998	May 2, 1998	May 18, 1998
Time	1:30 pm	3:00 pm	4:10 pm
Incorporation equipment	Field cultivator	N/A	N/A
Air/Soil temperature (F)	76/72	83/78	97/86
Relative humidity (%)	46	41	43
Wind (mph)	3	0	5
Weather	clear	mostly cloudy	partly cloudy
Soil moisture	moist	moist	moist
Crop stage/Height	N/A	N/A	3lf / 4"
Sprayer type/mph	Bk$PkCO_2$ / 3	Bk$PkCO_2$ / 3	Bk$PkCO_2$ / 3
Nozzle type/Size	Driftguard / 110015	Driftguard / 110015	Driftguard / 110015
Boom ht / # Noz / Spacing (in.)	18/6/20	18/6/20	19/6/20
Gpa / Psi	10/21	10/21	10/20
Weed species (density)	----------	(# leaves/height)	----------
BRAPP (3/ft^2)	N/A	N/A	3lf / 1"
Commercial ORYSA (1/ft^2)	N/A	N/A	3lf / 3"

Conclusions: This study was designed to look at the effects of PPI and PRE treatments with or without flushing. If growers do not have to flush the rice to get a stand, they often will not flush to get herbicide activity. Two showers of 0.4" rain were received about the time the flush sections were getting watered. All treatments effectively controlled the non-tolerant commercial rice, broadleaf signalgrass, and barnyardgrass. There was essentially no difference between flushing and not flushing for herbicide activity, perhaps because non-flushed plots received rainfall for activation. Significant early-

season rice injury occurred with early POST treatments. The injury delayed maturity, as can be seen in the % heading ratings. However, yield was not affected. Yield from POST treatments was actually higher because of heavy bird feeding that occurred in the rice that headed first. This study will be repeated in 1999.

Table 41. Section 1.

Herbicide	Rate	Application timing	Weed control: Broadleaf signalgrass (BRAPP) 5/15	5/29	6/17	7/9	7/27	Rice flatsedge (CYPIR) 5/15	Commercial rice (ORYSA) 5/15	5/29	Carpetweed (MOLVE) 5/29
	(lb/A)		(%)								
FLUSH:											
Untreated check			0	0	0	0	0	0	0	0	0
Imazethapyr	0.063	PPI	88	97	97	100	93	100	97	93	100
Imazethapyr	0.063	PRE	83	93	95	100	88	100	88	90	100
Imazethapyr fb	0.063	PPI									
imazethapyr +	0.063										
AG-98 (0.25%)		EPOST	85	98	100	100	100	100	98	98	100
Imazethapyr fb	0.063	PRE									
imazethapyr +	0.063										
AG-98 (0.25%)		EPOST	85	98	100	100	100	100	97	93	100
NO FLUSH:											
Untreated check			0	0	3	0	0	0	0	0	0
Imazethapyr	0.063	PPI	95	95	95	100	87	100	98	95	100
Imazethapyr	0.063	PRE	85	90	90	100	87	100	68	82	100
Imazethapyr fb	0.063	PPI									
imazethapyr +	0.063										
AG-98 (0.25%)		EPOST	87	98	100	100	100	100	87	98	100
Imazethapyr fb	0.063	PRE									
imazethapyr +	0.063										
AG-98 (0.25%)		EPOST	85	97	100	100	100	100	70	93	98
LSD (0.05)			12	7	7	1	12	1	9	5	1

continued

Table 41. Section 2.

Herbicide	Rate	Application timing	Barnyardgrass (ECHCG) control		Effect on rice					
					Injury				Heading	
			7/9	7/27	5/15	5/29	6/17	7/9	7/9	Yield
	(lb/A)		----------(%)----------							(lb/A)
FLUSH:										
Untreated check			0	0	0	0	0	0	37	1035
Imazethapyr	0.063	PPI	100	100	0	0	0	7	85	2205
Imazethapyr	0.063	PRE	100	100	0	0	0	5	85	2340
Imazethapyr fb	0.063	PPI								
imazethapyr +	0.063									
AG-98 (0.25%)		EPOST	100	100	0	32	17	7	43	2745
Imazethapyr fb	0.063	PRE								
imazethapyr +	0.063									
AG-98 (0.25%)		EPOST	100	100	0	32	3	12	48	2655
NO FLUSH:										
Untreated check			100	100	0	0	0	0	37	855
Imazethapyr	0.063	PPI	100	100	0	3	0	5	87	2070
Imazethapyr	0.063	PRE	100	100	0	3	0	3	87	2205
Imazethapyr fb	0.063	PPI								
imazethapyr +	0.063									
AG-98 (0.25%)		EPOST	100	100	0	33	13	8	42	2925
Imazethapyr fb	0.063	PRE								
imazethapyr +	0.063									
AG-98 (0.25%)		EPOST	100	100	0	33	12	13	40	2835
LSD (0.05)			0	0	0	4	9	8	29	810

Table 42. Multi-species weed control with imazethapyr in simulated rice field, Lonoke, 1998.

TEST INFORMATION

Location	Lonoke
Experimental Design / replications	RCB / 4
Plot size	10 ft by 20 ft
Soil type	Crowley silt loam (8% sand, 75% silt, 16% clay)
% OM / pH	0.9 / 4.3
Planting date	May 1, 1998
Harvest date	August 7, 1998
Crop/Variety	No crop
Dates of Flushing	May 7, 14, and 20, 1998
Date of Flooding	June 2, 1998

Comments: PPI = preplant incorporated; PRE = preemergence; DPRE = delayed preemergence; EPOST = early postemergence; and PREFL = preflood. Weed species were planted across each replication. Rice was not planted so that weed control evaluations would be unaffected by rice competition. Weed species planted included: entireleaf, ivyleaf, pitted, and palmleaf morningglory, prickly sida, sicklepod, hemp sesbania, and northern jointvetch. Several native species were also evaluated.

Application type	PPI	PRE	DPRE	EPOST	PREFL
Date applied	May 1, 1998	May 2, 1998	May 4, 1998	May 18, 1998	June 1, 1998
Time	12:30pm	2:30pm	4:00pm	4:42pm	3:30pm
Incorporation equipment	Field cultivator	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	74/72	78/78	83/84	97/84	97/98
Relative humidity (%)	44	49	40	39	43
Wind (mph)	3	0	2	5	1.5
Weather	clear	mostly cloudy	mostly clear	mostly clear	clear
Soil moisture	moist	moist	moist	moist	moist
Crop stage/Height	N/A	N/A	N/A	3 lf / 4"	1 tiller / 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.)	18 / 6 / 20	18 / 6 / 20	18 / 6 / 20	19 / 6 / 20	22 / 6 / 20
Gpa / Psi	10/21	10/21	10/21	10/20	10/20
Weed species (density)	----------	----------	(# leaves/height)	----------	----------
IPOLA (20/row ft)	N/A	N/A	N/A	2 lf / 2"	2-3 lf / 1"
IPOHE (6 row/ft)	N/A	N/A	N/A	1 lf / 1"	2-3 lf / 1"

Weed species (continued)	(# leaves/height)				
	PPI	PRE	DPRE	EPOST	PREFL
SEBEX (21/row ft)	N/A	N/A	N/A	2 lf / 1.5"	6 lf / 5"
SIDSP (80/row ft)	N/A	N/A	N/A	1 lf / 1"	N/A
IPOHG (17/row ft)	N/A	N/A	N/A	2 lf / 1"	2-3 lf / 1"
SENOB (34/row ft)	N/A	N/A	N/A	2 lf / 1.5"	N/A
AESVI (35/row ft)	N/A	N/A	N/A	1 lf / 1.5"	2-3 lf / 1"
CYPIR (200/ft^2)	N/A	N/A	N/A	3 lf / 0.5"	N/A
IPOWR (13/row ft)	N/A	N/A	N/A	1 lf / 1.5"	2-3 lf / 1"

Conclusions: Imazethapyr effectively controlled all morningglory species as well as prickly sida and sicklepod until the permanent flood was established. Hemp sesbania, water hyssop, and pink ammannia were not controlled by imazethapyr. Northern jointvetch was suppressed with the EPOST applications. Eclipta was effectively controlled with the 0.125 lb ai/A rate or the split applications of 0.063 lb ai/A. Purple ammannia, ducksalad, carpetweed, rice flatsedge, and broadleaf signalgrass were effectively controlled at all rates and timings.

Table 42. Section 1.

			Weed control									
			Pitted morningglory (IPOLA)			Ivyleaf morningglory (IPOHE)			Hemp sesbania (SEBEX)			
Herbicide	Rate	Application timing	5/15	5/27	6/15	5/15	5/27	6/15	5/15	6/27	6/15	7/6
	(lb/A)		(%)									
Untreated check			0	0	100	0	0	100	0	0	0	0
Imazethapyr	0.063	PPI	19	71	100	24	91	100	13	10	3	0
Imazethapyr	0.094	PPI	19	74	100	24	91	100	9	20	5	3
Imazethapyr	0.125	PPI	16	74	100	28	94	100	13	18	0	0
Imazethapyr	0.063	PRE	20	73	100	25	91	100	13	14	5	0
Imazethapyr	0.094	PRE	14	70	100	24	90	100	14	28	0	0
Imazethapyr	0.125	PRE	16	73	100	29	91	100	8	25	0	13
Imazethapyr	0.063	DPRE	13	66	100	18	85	100	4	5	0	0
Imazethapyr	0.094	DPRE	16	71	100	24	89	100	10	9	0	3
Imazethapyr	0.125	DPRE	21	73	100	19	91	100	8	13	0	3
Imazethapyr + AG-98 (0.25%)	0.063	EPOST	0	59	100	0	88	100	0	28	3	11

continued

Table 42. Section 1. Continued.

Herbicide	Rate	Application timing	Weed control: Pitted morningglory (IPOLA) 5/15	5/27	6/15	Ivyleaf morningglory (IPOHE) 5/15	5/27	6/15	Hemp sesbania (SEBEX) 5/15	6/27	6/15	7/6
	(lb/A)		(%)									
Imazethapyr + AG-98 (0.25%)	0.094	EPOST	0	56	100	0	86	100	0	21	0	8
Imazethapyr + AG-98 (0.25%)	0.125	EPOST	0	58	100	0	93	100	0	28	3	8
Imazethapyr fb imazethapyr + AG-98 (0.25%)	0.063 fb 0.063	PPI PREFL	19	70	100	30	94	100	14	11	0	5
Imazethapyr fb imazethapyr + AG-98 (0.25%)	0.063 fb 0.063	PRE PREFL	15	68	100	25	91	100	13	25	0	0
LSD (0.05)			6	7	NS	15	7	NS	NS	15	NS	NS

continued

Table 42. Section 2.

Herbicide	Rate	Application timing	Weed control: Prickly sida (SIDSP) 5/15	5/27	6/15	Entireleaf morningglory (IPOHG) 5/15	5/27	6/15	Sicklepod (SENOB) 5/15	5/27	6/15	Carpetweed (MOLVE) 5/27
	(lb/A)		(%)									
Untreated check			0	0	100	0	0	100	0	0	100	0
Imazethapyr	0.063	PPI	15	91	100	15	78	100	18	70	100	100
Imazethapyr	0.094	PPI	19	94	100	16	81	100	20	76	100	100
Imazethapyr	0.125	PPI	15	91	100	13	85	100	19	76	100	100
Imazethapyr	0.063	PRE	16	91	100	13	83	100	14	74	100	100
Imazethapyr	0.094	PRE	15	98	100	14	81	100	18	79	100	100

continued

Table 42. Section 2. Continued.

Herbicide	Rate	Application timing	Weed control: Prickly sida (SIDSP) 5/15	5/27	6/15	Entireleaf morningglory (IPOHG) 5/15	5/27	6/15	Sicklepod (SENOB) 5/15	5/27	6/15	Carpetweed (MOLVE) 5/27
	(lb/A)		(%)									
Untreated check			0	0	100	0	0	100	0	0	100	0
Imazethapyr	0.125	PRE	16	94	100	15	80	100	18	76	100	100
Imazethapyr	0.063	DPRE	20	91	100	10	76	100	9	69	100	100
Imazethapyr	0.094	DPRE	25	93	100	14	84	100	14	71	100	100
Imazethapyr	0.125	DPRE	18	94	100	15	84	100	13	80	100	100
Imazethapyr + AG-98 (0.25%)	0.063	EPOST	0	80	100	0	68	100	0	64	100	89
Imazethapyr + AG-98 (0.25%)	0.094	EPOST	0	85	100	0	64	100	0	61	100	91
Imazethapyr + AG-98 (0.25%)	0.125	EPOST	0	89	100	0	71	100	0	64	100	94
Imazethapyr fb imazethapyr + AG-98 (0.25%)	0.063 fb 0.063	PPI PREFL	20	93	100	13	84	100	14	73	100	100
Imazethapyr fb imazethapyr + AG-98 (0.25%)	0.063 fb 0.063	PRE PREFL	18	91	100	10	85	100	14	74	100	100
LSD (0.05)			10	5	NS	6	9	NS	5	12	NS	2

continued

Table 42. Section 3.

Herbicide	Rate	Application timing	Weed control: Northern jointvetch (AESVI) 5/15	5/27	6/15	7/6	Broadleaf signalgrass (BRAPP) 5/15	5/27	Palmleaf morningglory (IPOWR) 5/15	5/27	6/15	Rice flatsedge (CYPIR) 5/15	5/27
	(lb/A)		(%)										
Untreated check			0	0	0	0	0	0	0	0	100	0	0
Imazethapyr	0.063	PPI	11	63	10	3	94	100	15	89	100	100	100
Imazethapyr	0.094	PPI	11	66	23	10	93	100	19	89	100	100	100
Imazethapyr	0.125	PPI	16	63	18	18	98	100	20	89	100	100	100
Imazethapyr	0.063	PRE	14	66	20	10	90	100	11	89	100	100	100
Imazethapyr	0.094	PRE	13	71	28	18	93	99	16	90	100	100	100
Imazethapyr	0.125	PRE	15	68	33	23	93	100	24	90	100	100	100
Imazethapyr	0.063	DPRE	11	69	4	0	88	95	16	90	100	100	100
Imazethapyr	0.094	DPRE	10	69	33	20	88	100	19	90	100	100	100
Imazethapyr	0.125	DPRE	11	71	20	14	94	100	16	91	100	100	100
Imazethapyr + AG-98 (0.25%)	0.063	EPOST	0	76	58	46	0	90	0	90	100	0	88
Imazethapyr + AG-98 (0.25%)	0.094	EPOST	0	81	48	55	0	90	0	90	100	0	93
Imazethapyr + AG-98 (0.25%)	0.125	EPOST	0	80	49	43	0	90	0	90	100	0	88
Imazethapyr fb imazethapyr + AG-98 (0.25%)	0.063 PPI 0.063	EPOST	8	64	43	18	94	100	16	90	100	100	100
Imazethapyr fb imazethapyr + AG-98 (0.25%)	0.063 PRE 0.063	EPOST	9	70	48	18	88	98	16	91	100	100	100
LSD (0.05)			6	10	24	21	6	NS	7	2	0	1	3

continued

Table 42. Section 4.

Herbicide	Rate	Application timing	Weed control							
			Eclipta (ECLAL)		Waterhyssop (BACXX)		Ducksalad (HETLI)		Ammannia Purple (AMMCO)	Ammannia Pink (AMMTE)
	(lb/A)		7/6	7/27	7/6	7/27	7/6	7/27	7/27	7/27
			(%)							
Untreated check			0	0	0	0	0	0	0	0
Imazethapyr	0.063	PPI	88	96	63	0	91	93	94	0
Imazethapyr	0.094	PPI	78	89	58	0	91	98	95	0
Imazethapyr	0.125	PPI	93	95	69	0	94	100	100	0
Imazethapyr	0.063	PRE	79	86	25	0	78	81	98	0
Imazethapyr	0.094	PRE	84	88	49	0	85	98	100	0
Imazethapyr	0.125	PRE	84	95	76	0	99	95	100	0
Imazethapyr	0.063	DPRE	73	81	0	0	80	90	78	0
Imazethapyr	0.094	DPRE	83	93	63	0	89	93	98	0
Imazethapyr	0.125	DPRE	93	100	74	3	89	98	100	0
Imazethapyr + AG-98 (0.25%)	0.063	EPOST	75	68	60	0	83	93	91	0
Imazethapyr + AG-98 (0.25%)	0.094	EPOST	85	73	68	10	90	93	96	0
Imazethapyr + AG-98 (0.25%)	0.125	EPOST	98	91	80	20	95	90	91	0
Imazethapyr fb imazethapyr + AG-98 (0.25%)	0.063 fb 0.063	PPI fb PREFL	93	94	81	8	99	100	98	0
Imazethapyr fb imazethapyr + AG-98 (0.25%)	0.063 fb 0.063	PRE fb PREFL	93	98	79	15	98	98	100	0
LSD (0.05)			13	18	21	14	12	13	10	NS

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
AEF046360 (fenoxaprop + safener)	– (1.2 EC)	AgrEvo	(see fenoxaprop)
Activator 90 (surfactant)	--	UAP	–
AG-98 (surfactant)	–	Rohm & Haas	--
Agri-Dex (crop oil)	Agri-Dex	Helena	--
anilophos or anilofos	-- (2.5 EC)	AgrEvo	*S*-[2-[(4-chlorophenyl)(1-methylethyl)amino]-2-oxoethyl] *O*,*O*-dimethyl phosphorodithioate
bensulfuron	Londax (60 DF)	DuPont	2-[[[[[(4,6-dimethoxy-2-pyrimidinyl)amino]carbonyl] amino]sulfonyl]methyl]benzoic acid
bentazon + acifluorfen	Storm (4 SL)	BASF	3-(1-methylethyl)-(1*H*)-2,1,3-benzothiadiazin-4(3*H*)-one 2,2-dioxide + 5-[2-chloro-4-(trifluoromethyl)phenoxy]-2-nitrobenzoic acid
carbaryl (insecticide)	Sevin (4 F)	Rhone-Poulenc	1-naphthalenyl methylcarbamate
carfentrazone (F-8426)	Aim or Shark (40 DF)	FMC	*N*-[2,4-dichloro-5-(4-(difluoromethyl)-4,5-dihydro-3-methyl-5-oxo-1*H*-1,2,4-triazol)-1-ylphenyl]-methanesulfonamide
clethodim	Select (2 EC)	Valent	(*E*,*E*)-(+)-2-[1-[[(3-chloro-2-propenyl)oxy]imino] propyl]-5[2-(ethylthio)propyl]-3-hydroxy-2-cyclohexen-1-one
clomazone	Command (3 ME)	FMC	2-[(2-chlorophenyl)methyl]-4,4-dimethyl-3-isoxazolidinone
DE-537	– (2.37 EC)	Dow AgroSciences	--
fenoxaprop	Whip 1EC; Whip 360 (0.57 EC) Bugle (0.67 EC)	AgrEvo	(+)-2-[4-[(6-chloro-2-benzoxazolyl)oxy]phenoxy] propanoic acid
glufosinate	Liberty (1.67 EC)	AgrEvo	2-amino-4-(hydroxymethylphosphinyl)butanoic acid
glyphosate	Roundup Ultra (4 SL)	Monsanto	*N*-(phosphonomethyl)glycine
halosulfuron	Permit (75 DF)	Monsanto	3-chloro-5-[[[[(4,6-dimethoxy-2-pyrimidinyl)amino] carbonyl]amino]-sulfonyl]-1-methyl-1*H*-pyrazole-4-carboxylic acid
imazethapyr	Pursuit (2 EC, 70 WG)	Cyanamid	2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1*H*-imidazol-2-yl]-5-ethyl-3-pyridinecarboxylic acid
imazethapyr + imazaquin + pendimethalin	Steel (2.23 EC)	Cyanamid	– (see individual listings)

continued

Appendix Table 1. Continued.

Common name	Trade name (formulation[y])	Company	Chemical name
Kinetic (surfactant)	Kinetic	Helena	--
molinate	Ordram (15 G)	Zeneca	*S*-ethyl hexahydro-1*H*-azepine-1-carbothioate
pendimethalin	Prowl (3.3 EC); Pentagon (60 DF)	Cyanamid	*N*-(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine
Penetrator Plus (crop oil / surfactant)	Penetrator Plus	Helena	--
piperophos phosphorodithioate	-- (4.17 EC)	Novartis	*S*-[2-(2-methyl-1-piperidinyl)-2-oxoethyl] *O*,*O*-dipropyl
propanil	Stam 4M (4 EC); Stam 80DF; Super Wham (4 EC)	Rohm & Haas; Cedar	*N*-(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]diethylcarbamothioate
triclopyr	Grandstand (3 SL)	Dow AgroSciences	[(3,5,6-trichloro-pyridinyl)oxy]acetic acid
2,4-D	Weedar 64 (3.8 SL); Hi-Dep (3.8 SL)	Rhone-Poulenc; UAP	(2,4-dichlorophenoxy)acetic acid
V10029 [bispyribac-sodium (proposed)]	Regiment (80 WP)	Valent	sodium 2,6-bis[(4,6-dimethoxypryimidin-2-yl)oxy]benzoate

[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	*Leptochloa panicoides* (Presl) Hitchc.
Annual sedge	CYPCP	*Cyperus compressus* L.
Barnyardgrass	ECHCG	*Echinochloa crus-galli* (L.) Beauv.
Bearded sprangletop	LEFFA	*Leptochloa fascicularis* (Lam.) Gray
Broadleaf signalgrass	BRAPP	*Brachiaria platyphylla* (Griseb.) Nash.
Carpetweed	MOLVE	*Mollugo verticillata* L.
Common purslane	POROL	*Portulaca oleracea* L.
Eclipta	ECLAL	*Eclipta prostrata* L.
Hemp sesbania	SEBEX	*Sesbania exaltata* (Raf.) Rydb.
Morningglory species	IPOSS	*Ipomoea* spp.
Northern jointvetch	AESVI	*Aeschynomene virginica* (L.) B.S.P.
Palmleaf morningglory	IPOWR	*Ipomoea wrightii* Gray
Pink ammannia	AMMTE	*Ammannia latifolia* L.
Purple ammannia	AMMCO	*Ammannia coccinea* Rottb.
Red rice	ORYSA	*Oryza sativa* L.
Rice flatsedge	CYPIR	*Cyperus iria* L.
Sicklepod	SENOB	*Senna obtusifolia* L.
Smallflower morningglory	IAQTA	*Jacquemontia tamnifolia* (L.) Griseb.
Smartweed species	POLSS	*Polygonum* spp.
Spreading dayflower	COMDI	*Commelina diffusa* Burm. f.
Yellow nutsedge	CYPES	*Cyperus esculentus* 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, 1998.

	May			June			July			August		
	Temp.		Rain-	Temp.		Rain-	Temp.		Rain-	Temp.		Rain-
Day	Max	Min	fall	Max	Min	fall	Max	Min	fall	Max	Min	fall
	(°F)	(°F)	(in.)	(°F)	(°F)	(in.)	(°F)	(°F)	(in.)	(°F)	(°F)	(in.)
Fayetteville												
1	54	48	0.090	90	65		81	66	0.10	97	69	
2	69	48		86	71		83	65	0.32	100	69	
3	71	44	0.090	92	73		88	67		93	72	0.01
4	71	48		90	76		94	70		85	71	
5	79	53		88	56	0.05	96	71		89	70	0.68
6	77	56	0.420	62	47		93	74		86	67	
7	82	53	0.200	68	47		96	78		86	65	
8	78	50	0.018	74	65		94	75	0.04	89	67	
9	76	59		76	64	0.45	90	73	0.06	92	70	
10	73	52	0.670	86	71		98	78		77	69	0.31
11	77	54		85	71	0.03	97	77		93	71	0.01
12	80	59		83	70	0.07	82	71	0.15	87	68	0.17
13	85	60		91	63		87	73	0.49	89	70	
14	85	65		92	75		90	70		85	67	0.37
15	81	71		86	65		90	69		87	67	0.30
16	83	53		79	56		92	70		88	67	
17	85	59		86	66		91	64		89	69	
18	85	69		91	74	0.18	93	67		94	73	
19	88	67		88	68	0.12	94	71		96	71	0.01
20	89	66		89	68		94	77		95	70	0.10
21	90	68		94	73		98	78		93	64	
22	90	73		88	75	0.37	98	78		94	69	
23	87	72		91	69		98	74		94	70	
24	89	69		92	76		97	73	0.05	94	74	
25	89	61	0.800	92	77		90	72		97	76	
26	78	63	0.690	92	77		95	77		98	73	
27	80	60	0.620	92	75		102	80		98	74	0.04
28	84	63		88	75		101	72		99	77	
29	81	62		93	76		90	75		87	65	
30	83	64	0.530	93	71		100	79		92	64	
31	89	77					102	73	0.01	97	64	

continued

Appendix Table 3. Continued.

Day	May Temp. Max (°F)	May Temp. Min (°F)	May Rainfall (in.)	June Temp. Max (°F)	June Temp. Min (°F)	June Rainfall (in.)	July Temp. Max (°F)	July Temp. Min (°F)	July Rainfall (in.)	August Temp. Max (°F)	August Temp. Min (°F)	August Rainfall (in.)
Lonoke												
1	77	53		94	77		94	75	T	93	72	
2	80	52	0.37	95	71		98	74	0.04	95	72	
3	76	56	0.01	92	82		99	72		95	67	0.07
4	84	52		92	69	1.03	98	77	T	84	72	0.03
5	82	55	0.03	78	62	0.48	101	78	T	94	73	
6	85	69	T	75	56		104	77		92	73	0.31
7	87	64	0.37	80	56		106	81		86	72	0.01
8	83	61		85	65		103	81	0.08	91	68	T
9	79	64	0.03	92	78		101	79	0.04	96	68	0.04
10	82	61		94	77		105	78	0.43	95	74	
11	86	59		91	76		93	76	0.04	95	72	0.33
12	92	64		96	74	T	85	78	0.26	88	71	
13	91	64		96	74		91	73	0.24	90	72	1.19
14	85	65		94	72	0.24	92	74		87	72	
15	87	75		92	69	0.15	92	74		90	72	
16	91	65		92	64		94	76		91	69	
17	91	61		94	72		97	74		94	70	
18	92	69		92	80		101	76		93	77	
19	95	65		95	70		100	77		96	74	
20	93	64		98	79	0.26	102	76		94	75	
21	94	69		97	80		101	76		95	71	T
22	92	72		99	77		101	74	0.85	95	74	
23	87	74		100	74		99	75	T	97	72	
24	88	72		100	75		94	75	T	100	72	
25	91	72		101	77		96	76	T	103	75	
26	79	68	1.95	95	75		99	75	0.98	104	75	
27	87	67		94	76	T	102	78		101	75	
28	80	72	0.10	93	76		94	79		107	75	1.25
29	86	71		96	77		102	80		93	75	
30	89	69		100	81		101	80		96	74	
31	98	72					91	76		95	69	

continued

Appendix Table 3. Continued.

	May			June			July			August		
	Temp.		Rain-	Temp.		Rain-	Temp.		Rain-	Temp.		Rain-
Day	Max	Min	fall	Max	Min	fall	Max	Min	fall	Max	Min	fall
	(°F)	(°F)	(in.)	(°F)	(°F)	(in.)	(°F)	(°F)	(in.)	(°F)	(°F)	(in.)
Stuttgart												
1	67	54		100	72		99	74		90	72	
2	75	54		95	74		97	74		95	71	
3	79	53	0.44	96	75		96	75		98	74	
4	78	53		94	79		95	76		97	72	
5	81	55		95	69	0.27	97	78		96	72	
6	82	64		80	57	0.79	101	78		97	72	1.46
7	85	67	0.40	74	55		102	79		89	74	0.13
8	85	61		79	64		102	83		85	71	0.14
9	80	67		84	68		101	77	1.22	90	67	
10	81	62		92	79		99	78		93	74	
11	82	59		94	78		102	71	0.14	95	75	
12	84	64		93	77		93	76	0.35	92	72	0.10
13	91	67		96	74		83	74	0.22	89	73	0.10
14	90	67		97	78		88	74	0.16	89	74	1.45
15	85	70		95	69		90	73		85	72	
16	87	67		92	65		90	73		87	69	
17	89	61		91	72		91	74		89	69	
18	90	65		95	78		96	74		92	70	
19	93	68		96	73	0.03	97	74		95	72	
20	94	68		95	77		98	74		95	74	
21	92	70		98	79		99	74		93	70	
22	94	73		96	78		98	74		94	70	
23	91	73		98	75		96	74		93	69	
24	93	73		97	76		96	74		94	71	
25	88	72		97	77		95	76		96	71	
26	91	74		98	75		92	74		99	74	
27	83	68	0.58	94	76		95	76		101	74	
28	89	74		95	75		100	77		98	72	
29	80	69	0.05	93	75		95	78		101	72	0.77
30	87	69		95	77		100	77		93	72	
31	89	68					101	75		93	69	