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■ *The University of*
ILLINOIS
at Urbana-Champaign

Special Report 1991-10
t of Agronomy
l Experiment Station
Agriculture
of Illinois at Urbana-Champaign
h Goodwin Ave.
Urbana, IL 61801

1991 Illinois Weed Science Research and Extension Demonstration Report Final

■ *The University of*
ILLINOIS
at Urbana-Champaign

Agronomy Special Report 1991-10
Department of Agronomy
Agricultural Experiment Station
College of Agriculture
University of Illinois at Urbana-Champaign
1102 South Goodwin Ave.
Urbana, IL 61801

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INTRODUCTION

This report presents results from a portion of the weed science research of the University of Illinois. Emphasis is placed on research at the Northern Illinois Agronomy Research Center near DeKalb. However, significant research is also conducted at the Orr Agricultural Research and Demonstration Center near Perry in western Illinois, and at the Northwestern Agronomy Research and Demonstration Center near Monmouth as well as at Urbana. Many individuals have been involved with this year's research:

<u>Area Agronomists</u>
Lyle E. Paul (DeKalb)
Glenn A. Raines (Perry-Orr)
Michael J. Mainz (Monmouth)
M. Gene Oldham (Urbana)
Les V. Boone - Coordinator

<u>Farm Foremen</u>
David Lindgren (DeKalb)
Mike Vose (Perry-Orr)
Roland Caulkins (Monmouth)
Mike Plotner (Urbana)

<u>Community Colleges</u>
Ronald W. Heisner (Kishwaukee)
Russell Higgins (Joliet)

<u>Entomology</u>
Kevin L. Steffey
Hassan Oloumi-Sadeghi

<u>Secretaries</u>
Sharon E. Conatser
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<u>IPM Specialists</u>
Joseph D. Walsh
David C. Feltes

<u>Computer Programs</u>
David R. Pike

<u>County Extension Advisers</u>
Stan R. Eden

<u>Graduate Students</u>
Dale L. Baird
Robert C. Bellm
Craig A. Tomera
Steven B. Mulrooney
Russell A. Higgins

<u>Undergraduate Students</u>
Dan Block
Michael Sleight
Don Gibson
Jason Anderson

In addition, inputs have been made by other weed science and agronomy staff of the University of Illinois.

Appreciation is expressed to the administration of the Department of Agronomy, the Agricultural Experiment Station and others of the College of Agriculture, particularly for land, facilities, equipment and personnel at the research centers. A special thanks is extended to Ron Heisner for his involvement at DeKalb, to Dave Pike for his initiative at the Orr and Monmouth centers, and to Joseph Walsh for his involvement at DeKalb and Urbana. Special recognition is also extended to the area agronomists and farm foremen for their very professional and dedicated efforts.

We are very grateful to the many industry representatives who have provided valuable suggestions and encouragement. We especially acknowledge:
Luis Figuerola - Agrolinz Inc.
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Kevin Hahn and Lawrence S. Tapia - DuPont
Robert S. Perry - FMC Corporation

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Earl Kingman and Larry Weller - Growmark
Bill Bertges - Hoechst Roussel
Ronald Wolfe, Dale Chaney, and Gary Sexson - ICI Americas
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Randy Myers - Mobay Corporation
Jerry Flint - Monsanto
John Schoper - Pioneer Hi-Bred
William Striegel - Rhone-Poulenc
Luke Bozeman and Gary Schmitz - Sandoz Crop Protection
James Bower and James Garvin - Terra International
Frank Fronek and John Pickle - United Agri Products
Stephen L. Pearson - Spraying Systems Co.
Keith Sheriff and Howard Shepherd - Valent

More than thirty experiments were conducted at six different locations in the state with a variety of soil and climatic conditions. Land area is estimated at about 50 acres. Emphasis is placed on research that will help farmers operate more efficiently and conserve their land and energy resources while also maintaining environmental quality.

An estimated 350 million dollars worth of herbicides are used in Illinois by about 85,000 farmers and over 10,000 commercial applicators on about 20 million acres. Thus, a significant research effort is devoted to herbicides. However, a variety of weed control practices are considered.

We have attempted to place emphasis on research that will help farmers obtain broad-spectrum control at a reasonable cost. When we visualize new needs and opportunities, we attempt to design systems to fit changing production practices. However, we continue "standard" research to delineate optimum rates of herbicides for most of the crops and individual weed species of the state. We also consider potential for effect on subsequent crops.

As research results are moved into the technology transfer system, this information will be helpful to farmers, dealers, applicators and others facing the increased complexity of designing weed control systems. It is also our goal that the results presented here will be helpful to industry in planning their development strategy for Illinois.

We sincerely appreciate the cooperation of those involved with our University of Illinois weed science research and demonstration program.

Ellery L. Knake

Efficacy of nicosulfuron and primisulfuron on perennial grasses and legumes.
Mulrooney, Steven B., Ellery L. Knake, Lyle E. Paul, and Ronald W. Heisner. The purpose of this study was to determine the potential for using nicosulfuron or primisulfuron to control established Kentucky bluegrass, smooth bromegrass, orchardgrass, tall fescue, timothy, and Reed canarygrass. In addition, observations were made on alfalfa and red clover.

Location:	DeKalb SW500	Organic matter:	6%	Slope:	1 to 2%
Plot size:	10 X 160 ft	Soil pH:	6.1	Exp. design:	Randomized complete block
Drainage:	fair	Soil type:	Drummer silty clay loam	Replications:	3

Fertility: 120 lb P_2O_5 applied November 17, 1990; 120 lb K_2O applied November 15, 1990. A tractor mounted compressed air sprayer was used traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was ten feet with nozzles spaced 20 inches apart and 20 inches above the grass.

Date:	April 26, 1991	Soil moisture:	moist	Rainfall (inch)	
Time:	8:00 to 8:30am	Wind (mph):	8 ESE	previous week:	0.14
Treatment:	Postemergence	Sky (% overcast):	3	following week:	0.57
Temperature (F)		Relative			
air:	54	humidity(%):	73		
soil under sod 4 inch:	49				
Bluegrass		Tall fescue		Red clover	
height (inch)	7	height (inch)	8.5	Height (inch)	3.5
Brome		Timothy		Alfalfa	
height (inch)	9.5	height (inch)	8.5	Height (inch)	7.5
Orchardgrass		Reed canarygrass			
height (inch)	13	height (inch)	9.5		

Nicosulfuron did not give good control of established Kentucky bluegrass, smooth bromegrass, orchardgrass, tall fescue or Reed canarygrass. However, nicosulfuron did control timothy relatively well. Control of these grasses with primisulfuron was less than with nicosulfuron except for smooth bromegrass. Except for the possibility of nicosulfuron on timothy, control was not considered commercially adequate. Results suggested the possibility of Kentucky bluegrass having adequate tolerance to allow selective use of primisulfuron. Tall fescue and orchardgrass may also be in this same category. For alfalfa and red clover, control with primisulfuron was relatively good and nicosulfuron gave partial control. This suggests that these compounds may be useful for additional control of alfalfa or clover, for example, in no-till corn where an earlier treatment did not give complete control. Control of alfalfa or red clover in soybeans, especially with primisulfuron, may also be a possibility if sulfonylurea tolerant soybeans were used. Glyphosate provided good control of Kentucky bluegrass, timothy, and Reed canarygrass; relatively good control of orchardgrass, red clover and alfalfa; but had only modest effect on smooth bromegrass and tall fescue under the conditions of this study. (Dept. of Agronomy, University of Illinois, Urbana.)

Table. Efficacy of nicosulfuron and primisulfuron on perennial grasses and legumes (Mulrooney, Knake, Paul, and Heisner).

Treatment	Rate	Kebg 6/7	Kebg 7/3	Smbr 6/7	Smbr 7/3	Orgr 6/7	Orgr 7/3	Tafe 6/7	Tafe 7/3
		---------- Injury ----------							
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Nicosulfuron + COC	0.03125	30	17	17	10	30	13	30	30
Nicosulfuron + COC	0.0625	40	20	27	3	40	20	40	40
Primisulfuron + COC	0.036	10	7	40	33	10	10	10	3
Primisulfuron + COC	0.072	20	10	50	47	20	20	20	10
Glyphosate	2.0	100	100	57	90	90	90	50	50
	LSD(0.05)	0	6	19	9	0	5	0	5

Treatment	Rate	Timothy 6/7	Timothy 7/3	Recg 6/7	Recg 7/3	Clover 6/7	Clover 7/3	Alfalfa 6/7	Alfalfa 7/3
		---------- Injury ----------							
		(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Nicosulfuron + COC	0.03125	90	90	60	40	70	30	40	40
Nicosulfuron + COC	0.0625	100	100	70	53	80	70	50	53
Primisulfuron + COC	0.036	30	7	40	30	90	96	90	85
Primisulfuron + COC	0.072	50	23	50	43	100	100	100	95
Glyphosate	2.0	100	100	100	100	90	92	90	95
	LSD(0.05)	0	8	0	8	0	5	0	8

COC @ 1.0 qt/A: crop oil concentrate with 83% paraffin base petroleum oil, 16% surfactant, and 1% inert.
Kebg is Kentucky bluegrass.
Smbr is smooth bromegrass.
Orgr is orchardgrass.
Tafe is tall fescue.
Recg is Reed canarygrass.
Clover is red clover.

Single herbicide application for weed control in no-till soybeans after corn. Tomera, Craig A., Ellery L. Knake, Lyle E. Paul, Ronald W. Heisner, and David R. Pike. The purpose of this study was to evaluate herbicide treatments that give broad spectrum weed control conveniently and economically for soybeans no-till after corn with a single application.

Location:	DeKalb SW600S	Soil type:	Drummer silty clay loam	Crop:	Soybeans
Plot size:	10 X 29 ft.			Variety:	Pioneer 9272
Drainage:	fair	Slope:	0 to 1%	Seeding rate:	54.5 lb/A
Organic matter:	5 to 6%	Exp. design:	Randomized complete block	Planting date:	May 3, 1991
Soil pH:	6.2	Replications:	3	Row spacing:	30 inch

Tillage: Disked to chop stalks November 1, 1990; cultivated July 8, 1991.
A tractor mounted compressed air sprayer was used traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was ten feet with nozzles spaced 20 inches apart and 20 inches above the soil surface.

Date:	April 24, 1991	Soil moisture:	moist	Rainfall (inch)	
Time:	10:30am to noon	Wind (mph):	8 SSW	previous week:	0.15
Treatment:	Preemergence	Sky (% overcast):	25	following week:	0.57
Temperature (F)		Relative			
air:	54	humidity(%):	37		
soil under sod 4 inch:	47				

Giant foxtail		Common lambsquarters		Pennsylvania smartweed	
leaf no.	2	leaf no.	2 cotyl	leaf no.	2 cotyl
height (inch)	0.25	height (inch)	0.5	height (inch)	0.5

Metribuzin and chlorimuron in either a 6:1 or 10:1 ratio provided broad spectrum control of broadleaf weeds but only fair control of giant foxtail. Addition of pendimethalin, alachlor or metolachlor improved control of giant foxtail but control was not complete. Addition of clethodim or haloxyfop to metribuzin and chlorimuron was only partially successful in providing residual as well as burndown of grass weeds. Imazethapyr plus pendimethalin provided excellent control of the spectrum of broadleaf weeds present and good control of giant foxtail. Clomazone alone or in combination with metribuzin, metribuzin and chlorimuron, or pendimethalin provided excellent broad spectrum control of both broadleaf and grass weeds.
(Dept. of Agronomy, University of Illinois, Urbana.)

Table 1. Single herbicide application for weed control in no-till soybeans after corn (Tomera, Knake, Paul, Heisner, and Pike).

Treatment	Rate	Soybean 5/22	Soybean 6/7	Gift 5/22	Gift 6/7	Colq 5/22	Col 6/
		--- injury ----		------ control ----------			
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%
Metribuzin & chlorimuron	0.28 & 0.047	0	0	50	63	100	10
Metr & clim + pendimethalin	0.28 & 0.047 + 1.0	0	0	80	88	100	10
Metr & clim + alachlor	0.28 & 0.047 + 2.5	0	0	90	93	100	10
Metr & clim + metolalachlor	0.28 & 0.047 + 2.0	0	0	88	93	100	10
Metr & clim	0.35 & 0.035	0	0	80	70	100	10
Metr & clim + pend	0.35 & 0.035 + 1.0	0	0	87	80	100	10
Metr & clim + alac	0.35 & 0.035 + 2.5	0	0	87	85	100	10
Metr & clim + meto	0.35 & 0.035 + 2.5	0	0	80	83	100	10
Pend & imazethapyr	0.875 & 0.063	0	0	87	91	98	10
Pend & imep + 2,4-D[1]	0.875 & 0.063 + 0.475	0	0	90	94	100	10
Pend & imep + metr	0.875 & 0.063 + 0.38	1.6	0	88	95	100	10
Clomazone	1.0	0	0	100	99	100	10
Clom + metr	0.75 + 0.38	5	0	98	99	100	10
Clom + metr & clim	0.5 + 0.14 & 0.024	0	0	98	99	100	10
Clom + metr & clim	0.75 + 0.21 & 0.035	5	0	98	99	100	10
Clom + pend	0.75 + 1.0	0	0	95	96	100	10
Metr & clim + haloxyfop	0.28 & 0.047 + 0.2	0	0	87	87	100	10
Metr & clim + clethodim	0.28 & 0.047 + 0.094	0	0	80	73	100	10
Metr & clim + clet	0.35 & 0.035 + 0.094	0	0	70	67	100	10
Check		0	0	0	0	0	
	LSD(0.05)	1	0	5	8	1	

Table 2. Single herbicide application for weed control in no-till soybeans after corn (Tom Knake, Paul, Heisner, and Pike).

Treatment	Rate	Vele 5/22	Vele 6/7	Pesw 5/22	Pesw 6/7	Soybea yield
		---------- control ----------				
	(lb/A)	(%)	(%)	(%)	(%)	(bu/a
Metribuzin & chlorimuron	0.28 & 0.047	100	100	100	100	20.3
Metr & clim + pendimethalin	0.28 & 0.047 + 1.0	97	100	100	100	29.4
Metr & clim + alachlor	0.28 & 0.047 + 2.5	97	100	100	100	33.1
Metr & clim + metolalachlor	0.28 & 0.047 + 2.0	92	100	100	100	34.6
Metr & clim	0.35 & 0.035	97	100	100	100	28.7
Metr & clim + pend	0.35 & 0.035 + 1.0	87	100	100	100	28.8
Metr & clim + alac	0.35 & 0.035 + 2.5	85	100	100	100	35.5
Metr & clim + meto	0.35 & 0.035 + 2.5	65	100	100	100	24.8
Pend & imazethapyr	0.875 & 0.063	93	100	100	100	31.9
Pend & imep + 2,4-D[1]	0.875 & 0.063 + 0.475	92	100	100	100	34.7
Pend & imep + metr	0.875 & 0.063 + 0.38	97	100	100	100	31.7
Clomazone	1.0	97	100	100	100	34.6
Clom + metr	0.75 + 0.38	98	100	100	100	32.2
Clom + metr & clim	0.5 + 0.14 & 0.024	97	100	100	100	33.7
Clom + metr & clim	0.75 + 0.21 & 0.035	98	100	100	100	32.7
Clom + pend	0.75 + 1.0	95	100	100	100	36.2
Metr & clim + haloxyfop	0.28 & 0.047 + 0.2	95	100	100	100	29.9
Metr & clim + clethodim	0.28 & 0.047 + 0.094	88	100	100	100	25.2
Metr & clim + clet	0.35 & 0.035 + 0.094	83	100	100	100	22.7
Check		0	0	0	0	9.8
	LSD(0.05)	19	0	0	0	6.2

[1]The 2,4-D was a butoxyethyl ester.

Sequential herbicide applications for weed control in no-till soybeans after corn. Tomera, Craig A., Ellery L. Knake, Lyle E. Paul, Ronald W. Heisner, and David R. Pike. The purpose of this study was to evaluate sequential herbicide treatments for no-till soybeans after corn.

Location:	DeKalb SW600N	Soil type:	Drummer silty clay loam	Crop:	Soybeans
Plot size:	10 X 29 ft.			Variety:	Pioneer 9272
Drainage:	fair	Slope:	0 to 1%	Seeding rate:	54.5 lb/A
Organic matter:	5 to 6%	Exp. design:	Randomized complete block	Planting date:	May 3, 1991
Soil pH:	6.2			Row spacing:	30 inch
		Replications:	3		

Tillage: Disked to chop stalks November 1, 1990; cultivated July 8, 1991.

A tractor mounted compressed air sprayer was used traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was ten feet with nozzles spaced 20 inches apart and 20 inches above the soil surface for preemergence and 20 inches above the weeds for postemergence.

Date:	April 24	May 23	May 30
Time:	12:00 noon	8:15am	10:15am
Treatment:	Preemergence	Postemergence	Late postemergence
Temperature (F)			
air:	61	70	75
soil under sod 4 inch:	49	64	70
Soil moisture:	moist	moist	moist
Wind (mph):	10 SSW	13 NNE	4 W
Sky (% overcast):	25	85	5
Relative humidity(%):	22	95	75
Rainfall (inch)			
previous week:	0.15	0.82	3.93
following week:	0.57	3.93	1.23
Giant foxtail		Soybeans	Giant foxtail
leaf no.	2	leaf no. unifoliate	leaf no. 5
height (inch)	0.25	height (inch) 3	height (inch) 4 to 5
Common lambsquarters		Giant foxtail	
leaf no.	2 to 4	leaf no. 1 to 2	
height (inch)	0.5	height (inch) 2 to 4	
Pennsylvania smartweed		Yellow nutsedge	
leaf no.	2 cotyl	leaf no. 4	
height (inch)	0.5	height (inch) 4	
		Common lambsquarters	
		leaf no. 10 to 12	
		height (inch) 4 to 5	
		Velvetleaf	
		leaf no. 3	
		height (inch) 3	
		Pennsylvania smartweed	
		leaf no. 3	
		height (inch) 3	
		Barnyard grass	
		leaf no. 2	
		height (inch) 4	

Paraquat plus metribuzin followed by fluazifop-P, metribuzin and chlorimuron followed by quizalofop or clethodim, and acifluorfen plus metribuzin followed by sethoxydim all provided very good broad spectrum weed control. Early application of 2,4-D or 2,4-DB plus sethoxydim performed well. And acifluorfen plus 2,4-D early followed by bentazon plus acifluorfen and then sethoxydim also performed very well. Glyphosate or sulphosate followed by fomesafen and fluazifop-P gave good control of giant foxtail but incomplete control of broadleaf weeds. Similarly, fomesafen followed by fluazifop-P gave good control of giant foxtail but not all of broadleaf weeds. Lactofen followed by clethodim plus lactofen performed well except on common lambsquarters. Substituting thifensulfuron for chlorimuron with metribuzin followed by quizalofop gave excellent broadleaf weed control and appeared to control the early emerging giant foxtail but not that which emerged after application of the quizalofop. (Dept of Agronomy, University of Illinois, Urbana.)

Table 1. Sequential herbicide applications for weed control in no-till soybeans after corn (Tomera, Knake, Paul, Heisner, and Pike).

Treatment	Rate	Soybean 5/22	Soybean 6/7	Gift 5/22	Gift 6/7	Colq 5/22	Colq 6/7
		-- injury --		---------- control ----------			
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)
Paraquat + Metribuzin + X-77/fluazifop-P + COC[1]	0.625 + 0.38 0.25% / 0.188	3	7	57	100	100	100
Metr & chlorimuron + COC/ quizalofop + COC	0.28 & 0.047 0.044	0	8	57	99	100	100
Metr & clim + COC/ clethodim + COC	0.28 & 0.047 0.094	0	7	57	100	100	100
Acifluorfen + metr + COC/ sethoxydim + COC	0.125 + 0.38 0.125	5	8	50	99	100	100
2,4-D[2] + seth + COC/ bentazon & acif+ 28%N/ seth + COC[3]	0.475 + 0.0625/ 0.75 & 0.17 + 1 gal/ 0.125	3	10	20	93	90	100
2,4-DB + seth + COC/ bent & acif + seth + Dash[4]	0.2 + 0.0625/ 0.92 + 0.125 + 1%	0	8	10	92	93	100
Glyphosate/ fluazifop-P & fomesafen+COC	0.38/ 0.188 & 0.25	0	8	10	100	80	93
Sulphosate/ fluazifop-p & fomesafen+COC	0.38/ 0.188 & 0.25	0	5	23	100	7	27
Fome + COC/ flfp + COC	0.25/ 0.188	0	5	53	100	67	47
Acif + 2,4-D + Dash/ bent & acif + 28%N + X-77[5]/ seth + Dash	0.125 + 0.48 0.92 + 2% + 1/8%/ 0.125 + 1/2%	5	8	47	99	97	100
Lactofen + COC/ lact + clet + COC	0.2/ 0.2 + 0.094 + 1/2%	0	17	33	100	70	80
Metribuzin + thifensulfuron + COC/ quizalofop + COC	0.38 + 0.004 + 0.044	0	8	60	87	100	100
Check		0	0	0	0	0	0
	LSD(0.05)	2	5	7	6	12	18

[1] COC @ 1.0 qt/A: Crop oil concentrate, 83% paraffin base petroleum oil, with 16% surfactant, and 1% inert.
[2] The 2,4-D was a butoxyethyl ester.
[3] Final sequential treatment applied 5/30/91 at 10:15 am.
[4] Dash @ 1.0 pt/A: an adjuvant from BASF.
[5] X-77 is a nonionic surfactant from Valent.

Table 2. Sequential herbicide applications for weed control in no-till soybeans after corn (Tomera, Knake, Paul, Heisner, and Pike).

Treatment	Rate	Vele 5/22	Vele 6/7	Pesw 5/22	Pesw 6/7	Soybean yield
		control				
	(lb/A)	(%)	(%)	(%)	(%)	(bu/A)
Paraquat + Metribuzin + X-77/fluazifop-P + COC 0.25%	0.625 + 0.38 0.188	73	92	100	100	36.4
Metr & chlorimuron + COC/ quizalofop + COC	0.28 & 0.047 0.044	83	99	100	100	40.1
Metr & clim + COC/ clethodim + COC	0.28 & 0.047 0.094	80	100	100	100	40.7
Acifluorfen + metr + COC/ sethoxydim + COC	0.125 + 0.38 0.125	88	97	100	100	40.2
2,4-D[2] + seth + COC/ bentazon & acif + 28%N/ seth + COC[3]	0.475 + 0.0625/ 0.75 & 0.17 + 1 gal/ 0.125	77	100	70	100	36.0
2,4-DB + seth + COC/ bent & acif + seth + Dash[4]	0.2 + 0.0625/ 0.92 + 0.125 + 1%	77	98	47	100	38.4
Glyphosate/ fluazifop-P & fomesafen+COC	0.38/ 0.188 & 0.25	73	88	43	60	33.1
Sulphosate/ fluazifop-P & fomesafen+COC	0.38/ 0.188 & 0.25	23	57	13	83	28.2
Fome + COC/ flfp + COC	0.25/ 0.188	83	87	70	93	34.3
Acif + 2,4-D + Dash/ bent & acif + 28%N + X-77[5]/ seth + Dash	0.125 + 0.48 0.92 + 2% + 1/8% 0.125 + 1/2%	63	100	60	100	38.7
Lactofen + COC/ lact + clet + COC	0.2/ 0.2 + 0.094 + 1/2%	73	100	93	99	35.1
Metribuzin + thifensulfuron + COC/ quizalofop + COC	0.38 + 0.004 + 0.044	97	100	100	100	35.1
Check		0	0	0	0	18.6
	LSD(0.05)	9	23	12	15	8.4

[1] COC @ 1.0 qt/A: Crop oil concentrate, 83% paraffin base petroleum oil, with 16% surfactant, and 1% inert.
[2] The 2,4-D was a butoxyethyl ester.
[3] Final sequential treatment applied 5/30/91 at 10:15 am.
[4] Dash @ 1.0 pt/A: an adjuvant from BASF.
[5] X-77 is a nonionic surfactant from Valent.

Multi-species evaluation of soil-applied herbicides. Knake, Ellery L., Ronald W. Heisner, Lyle E. Paul, and David C. Feltes. The purpose of this study was to evaluate crop tolerance and degree of weed control for herbicides preplant incorporated, preplant incorporated followed by sequential postemergence applications, and surface-applied. Most crops and annual weed species of importance in Illinois were included.

Location:	DeKalb SW700	Soil type:	Drummer silty clay loam	Planting date:	April 23
Plot size:	10 X 150 ft			Row spacing:	30 inch and 5 ft
Drainage:	fair	Slope:	1 to 2%		
Organic matter:	5 to 6%	Exp. design:	Randomized complete block		
Soil pH:	6.3				

Tillage: residue chopped once, part on August 6, 1990 and the rest on August 14; disked August 30, 1990; field cultivated October 13; disked and harrowed twice to incorporate herbicide April 22, 1991.

A tractor mounted compressed air sprayer was used traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was ten feet with nozzles spaced 20 inches apart and 20 inches above the soil surface.

Date:	April 22, 1991	April 24	May 23
Time:	2:30 to 5pm	1:00 to 2:00pm	7:45 to 8:15am
Treatment:	Preplant incorporated	Preemergence	Postemergence sequential
Temperature (F)			
air:	59	59	70
soil under sod			
4 inch:	49	45	64
Soil moisture:	moist	moist	moist
Wind (mph & dir):	10 W	11 SSW	11 S
Sky (% overcast):	20	25	100
Relative humidity(%):	28	25	93
Rainfall (inch)			
previous week:	0.57	0.15	1.82
following week:	0.26	0.57	4.42
No species present		No species present	

Species present on May 23:

Corn		Large crabgrass		Common sunflower	
leaf no.	2	leaf no.	3	leaf no.	4
height (inch)	4	height (inch)	3	height (inch)	6 to 8
Soybean		Barnyard grass		Common ragweed	
leaf no.	1st trif	leaf no.	2	leaf no.	2
height (inch)	4	height (inch)	2	height (inch)	2
Sunflower		Redroot pigweed		Giant ragweed	
leaf no.	4	leaf no.	2	leaf no.	2
height (inch)	6 to 8	height (inch)	1	height (inch)	1.5
Sorghum		Common lambsquarters		Fall panicum	
leaf no.	2	leaf no.	2	leaf no.	2
height (inch)	4	height (inch)	1	height (inch)	2
Hairy vetch		Velvetleaf		Shattercane	
leaf no.	6	leaf no.	1	leaf no.	2
height (inch)	3	height (inch)	2	height (inch)	2
Cocklebur		Jimsonweed		Canola	
leaf no.	cotyl	leaf no.	cotyl	leaf no.	4
height (inch)	2	height (inch)	1	height (inch)	6
Giant foxtail		Tall morningglory		Oats	
leaf no.	3	leaf no.	2	leaf no.	3
height (inch)	3	height (inch)	1.5	height (inch)	3
Yellow foxtail		Ivyleaf morningglory		Wheat	
leaf no.	2	leaf no.	2	leaf no.	4
height (inch)	3	height (inch)	1.5	height (inch)	4
Green foxtail		Eastern black nightshade		Alfalfa	
leaf no.	2	leaf no.	2	leaf no.	3 to 4 trif
height (inch)	3	height (inch)	1	height (inch)	2 to 3
				Red clover	
				leaf no.	2 trif
				height (inch)	2

Performance of dry flowable formulations of trifluralin was very similar to that of the EC formulation whether used alone or in various combinations. No problems were encountered in mixing or application of the dry flowables. The dry formulation of alachlor also performed well.

Of the various genetic lines of corn from the Independent Professional Seedsmen Association (IPSA) IPSA C1128 and IPSA C8004 appeared to be least vigorous; IPSA C1284, IPSA C4843, and IPSA C6114 moderate; and IPSA C6973 most vigorous. In general, the more vigorous lines appeared to be more tolerant of herbicides. There appeared to be little difference in the degree of tolerance for the soybean cultivars with the soil-applied herbicides. Canola exhibited good tolerance to trifluralin. Hairy vetch exhibited relatively good tolerance to trifluralin and to imazethapyr but was controlled with atrazine or a metribuzin and chlorimuron combination. Except for trifluralin and ethalfluralin, tolerance of sunflower was generally not adequate. There was little indication of adequate tolerance with most treatments for use in sorghum, wheat, or oats. Alfalfa generally exhibited relatively good tolerance to trifluralin, pendimethalin, ethalfluralin, imazethapyr and EPTC.

Control of redroot pigweed and common lambsquarters was excellent with nearly all treatments. Except for the dinitroanilines, control of common ragweed was also quite good. Except for the dinitroanilines and acetanilides, most treatments gave good control of velvetleaf; however, metribuzin plus chlorimuron was better than chlorimuron or thifensulfuron alone.

For common cocklebur, some of the more effective treatments included metribuzin plus chlorimuron, atrazine, bentazon, chlorimuron, and lactofen. Most treatments controlled jimsonweed rather well except the dinitroanilines and clomazone. Control of ivyleaf and tall morningglory was quite similar with the various treatments; treatments which included atrazine were generally most effective with many other treatments giving only partial control. While most sulfonylureas and dinitroanilines provided little or no help for eastern black nightshade, imazethapyr, atrazine, the acetanilides, lactofen and acifluorfen were effective. Most treatments gave relatively good control of most annual grass weeds. However, control of annual grass with metribuzin and chlorimuron was only fair. Observations suggested an antagonistic effect of imazethapyr on annual grass control with EPTC.

Of the relatively new compounds XRM 5313 indicated relatively good soybean tolerance, good control of most annual grass weeds; and compared to trifluralin alone, significant improvement in control of velvetleaf, jimsonweed, eastern black nightshade, and common ragweed as well as partial control of common cocklebur and common sunflower, but little additional help on annual morningglories. Lack of adequate tolerance would likely preclude use on sunflower and canola, but alfalfa and hairy vetch appeared to have moderate tolerance.

MON 13280 gave control of the foxtails with a rate response, was better on large crabgrass, poor on barnyardgrass, and had activity on shattercane. It gave good control of redroot pigweed, common lambsquarters, and eastern black nightshade and had some activity on velvetleaf, jimsonweed, annual morningglories and common ragweed. Combination with imazethapyr or metribuzin and chlorimuron significantly improved control of most broadleaf weeds and also of some grass weeds. Degree of crop tolerance would likely preclude use on the crops included in this study other than soybeans.

Acetachlor generally provided good control of grass weeds, redroot pigweed, common lambsquarters, eastern black nightshade, common ragweed, and jimsonweed. When incorporated it had activity on velvetleaf. Addition of atrazine further enhanced control. Crop tolerance could be of more concern than with alachlor, making the addition of a safening agent worthy of consideration. (Dept. of Agronomy, University of Illinois, Urbana.)

Table 1. Multi-species evaluation of soil-applied herbicides (Knake, Heisner, Paul, and Feltes).

Treatment	Rate	------IPSA[1] Corn varieties------						——Soybeans——		
		C1128	C1284	C4843	C6114	C6973	C8004	Archer	Bell	Chapman
		---------- Injury ----------								
PREPLANT INCORPORATED:	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Ethalfluralin + trif[2]	0.67 + 0.33	70	60	50	60	40	60	0	0	0
Trifluralin[2]	1.5	80	70	60	70	50	70	0	0	0
Trifluralin[3] + imep	1.0 + 0.063	75	65	55	65	45	65	0	0	0
Trifluralin[3]	1.0	70	60	50	60	40	60	0	0	0
Trifluralin[4]	1.0	70	60	50	60	40	60	0	0	0
Trifluralin[2] + metr & chlorimuron	1.0 + 0.28 & 0.047	75	65	55	65	45	65	0	0	0
Trifluralin[3] + metr & chlorimuron	1.0 + 0.28 & 0.047	75	65	55	65	45	65	0	0	0
Trifluralin[4] + metr & chlorimuron	1.0 + 0.28 & 0.047	75	65	55	65	45	65	0	0	0
Trifluralin[4] + metr & chlorimuron	1.0 + 0.35 & 0.035	75	65	55	65	45	65	0	0	0
Pendimethalin & imep	0.875 & 0.063	65	55	45	45	35	55	0	0	0
Trifluralin[2]	1.0	70	60	50	60	40	60	0	0	0
Trifluralin[4] + imep	1.0 + 0.063	75	65	55	65	45	65	0	0	0
Check		0	0	0	0	0	0	0	0	0
Trifluralin & imep	0.75 & 0.063	75	65	55	65	45	65	0	0	0
Trifluralin & DE 498	0.85 & 0.062	70	60	50	60	40	60	2	2	2
Trifluralin & DE 498	0.96 & 0.07	75	65	55	65	45	65	4	4	4
Trifluralin[4] + clom	0.75 + 0.75	70	60	50	60	40	60	0	0	0
Clomazone & trif	0.75 & 1.0	70	60	50	60	40	60	0	0	0
Butylate + atrazine	4.0 + 1.5	0	0	0	0	0	0	95	95	95
EPTC & dichlormid & dietholate + atra	4.0 + 1.5	0	0	0	0	0	0	95	95	95
Mon 8421 (acet)	2.0	10	10	10	10	10	10	50	50	50
Mon 8421 + atra	2.0 + 1.5	10	10	10	10	10	10	80	80	80
ICIA 5676	2.0	5	5	5	5	5	5	50	50	50
ICIA 5676 + atra	2.0 + 1.5	5	5	5	5	5	5	80	80	80
EPTC & dichlormid & dietholate + imep	4.0 + 0.063	10	20	20	20	20	20	5	5	5
Trifluralin[4] / imep + X-77 + 28%N	1.0 / 0.063 0.25% + 2%	70	70	70	70	70	70	5	5	5
Trifluralin[4] / bent & acifluorfen + 28%N	1.0 / 0.75 & 0.1675 + 4%	60	60	60	50	50	60	5	5	5
Trifluralin[4] / clim + thifensulfuron + X-77 + 28% N	1.0 / 0.004 + 0.004 + 0.25% + 2%	80	70	50	60	50	80	5	5	5
Trif[4] / lactofen + COC[5]	1.0 / 0.2 + 1%	50	50	50	50	50	50	20	20	20
Trifluralin[4] / clim + COC + 28%N	1.0 / 0.008 + 1% + 2%	60	60	60	60	60	60	5	5	5
EPTC & dichlormid & dlat / nicosulfuron + COC + 28%N	4.0 / 0.031 + 1% + 4%	5	5	5	5	5	5	30	30	30
EPTC & dichlormid & dlat / primisulfuron+ COC + 28%N	4.0 / 0.036 + 1% + 4%	5	5	5	5	5	5	60	60	60
Pend & imazethapyr / lactofen + X-77 + 28%N	0.88 & 0.063 / 0.125 + .25% + 4%	50	60	60	40	50	50	20	20	20
Metolachlor & atra / primisulfuron + COC + 28%N	2.0 & 1.0 / 0.036 + 1% + 4%	10	10	10	10	10	10	80	80	80
Check		0	0	0	0	0	0	0	0	0
PREEMERGENCE:										
Metribuzin & clim	0.35 & 0.035	30	40	40	30	30	30	0	0	0
Metribuzin & clim	0.28 & 0.047	35	40	50	30	40	40	0	0	0
MON 8421 (acet)	2.0	10	10	10	10	10	10	20	20	20
MON 8421 + atrazine	2.0 + 1.5	10	10	10	10	10	10	25	25	25
ICIA 5676	2.0	10	10	10	10	10	10	20	20	20
ICIA 5676 + atrazine	2.0 + 1.5	10	10	10	10	10	10	25	25	25
MON 13280	0.2	10	10	10	10	10	10	5	5	5
MON 13280	0.3	15	15	15	15	15	15	10	10	10
MON 13280 + metribuzin & clim	0.3 + 0.28 & 0.047	50	50	50	50	50	50	15	15	15
MON 13280 + imep	0.3 + 0.063	40	40	40	40	40	40	15	15	15
Alachlor(65WDG)	3.0	0	0	0	0	0	0	0	0	0
Imazethapyr	0.063	40	30	40	30	30	30	0	0	0
Pendimethalin & imep	0.875 & 0.063	40	30	40	30	30	30	0	0	0
Imazethapyr + atra	0.063 + 1.5	40	30	40	30	30	30	90	90	90
V-53482	0.094	10	10	20	10	10	10	5	5	5

Table 2. Multi-species evaluation of soil-applied herbicides (Knake, Heisner, Paul, and Feltes).

Treatment	Rate	Soybeans: Jack	Soybeans: Kunitz	Soybeans: Williams 82	Soybeans: Williams 82 STS	Sunflower	Sorghum	Hairy vetch
		Injury						
PREPLANT INCORPORATED:	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Ethalfluralin + trif[2]	0.67 + 0.33	0	0	0	0	0	98	30
Trifluralin[2]	1.5	0	0	0	0	0	100	60
Trifluralin[3] + imep	1.0 + 0.063	0	0	0	0	90	98	40
Trifluralin[3]	1.0	0	0	0	0	0	95	40
Trifluralin[4]	1.0	0	0	0	0	0	95	40
Trifluralin[2] + metr & chlorimuron	1.0 + 0.28 & 0.047	0	0	0	0	99	95	90
Trifluralin[3] + metr & chlorimuron	1.0 + 0.28 & 0.047	0	0	0	0	99	95	90
Trifluralin[4] + metr & chlorimuron	1.0 + 0.28 & 0.047	0	0	0	0	99	95	90
Trifluralin[4] + metr & chlorimuron	1.0 + 0.35 & 0.035	0	0	0	0	99	96	90
Pendimethalin & imep	0.875 & 0.063	0	0	0	0	80	95	10
Trifluralin[2]	1.0	0	0	0	0	0	95	10
Trifluralin[4] + imep	1.0 + 0.063	0	0	0	0	80	98	10
Check		0	0	0	0	0	0	0
Trifluralin & imep	0.75 & 0.063	0	0	0	0	90	98	10
Trifluralin & DE 498	0.85 & 0.062	2	2	2	2	80	97	20
Trifluralin & DE 498	0.96 & 0.07	4	4	4	4	85	98	30
Trifluralin[4] + clom	0.75 + 0.75	0	0	0	0	90	80	20
Clomazone & trif	0.75 & 1.0	0	0	0	0	90	98	30
Butylate + atrazine	4.0 + 1.5	95	95	95	95	100	20	95
EPTC & dichlormid & diethotate + atra	4.0 + 1.5	95	95	95	95	100	40	95
MON 8421 (acet)	2.0	50	50	50	50	20	50	80
MON 8421 + atra	2.0 + 1.5	80	80	80	80	80	60	95
ICIA 5676	2.0	50	50	50	50	20	50	80
ICIA 5676 + atra	2.0 + 1.5	80	80	80	80	80	60	95
EPTC & dichlormid & diethotate + imep	4.0 + 0.063	5	5	5	5	80	85	50
Trifluralin[4] / imep + X-77 + 28%N	1.0 / 0.063 0.25% + 2%	5	5	5	5	50	100	40
Trifluralin[4] / bent & acifluorfen + 28%N	1.0 / 0.75 & 0.1675 + 4%	5	5	5	5	50	97	50
Trifluralin[4] / clim + thifensulfuron + X-77 + 28% N	1.0 / 0.004 + 0.004 + 0.25% + 2%	5	5	5	5	50	97	90
Trifluralin[4]/lactofen + COC[5]	1.0 / 0.2 + 1.0%	20	20	20	20	80	98	70
Trifluralin[4] / clim + COC + 28%N	1.0 / 0.008 + 1.0% + 2.0%	5	5	5	5	40	99	80
EPTC & dichlormid & dlat / nicosulfuron + COC + 28%N	4.0 / 0.031 + 1.0% + 4.0%	30	30	30	30	20	97	80
EPTC & dichlormid & dlat / primisulfuron+ COC + 28%N	4.0 / 0.036 + 1.0% + 4.0%	60	60	60	60	80	97	98
Pend & imazethapyr / lactofen + X-77 + 28%N	0.88 & 0.063/ 0.125 + 0.25% + 4.0%	20	20	20	20	90	98	80
Metolachlor & atra / primisulfuron + COC + 28%N	2.0 & 1.0 / 0.036 + 1.0% + 4.0%	80	80	80	80	100	90	98
Check		0	0	0	0	0	0	0
PREEMERGENCE:								
Metribuzin & clim	0.35 & 0.035	0	0	0	0	30	50	20
Metribuzin & clim	0.28 & 0.047	0	0	0	0	40	60	40
MON 8421 (acet)	2.0	20	20	20	20	20	20	90
MON 8421 + atrazine	2.0 + 1.5	25	25	25	25	70	30	100
ICIA 5676	2.0	20	20	20	20	20	10	90
ICIA 5676 + atrazine	2.0 + 1.5	25	25	25	25	90	20	100
MON 13280	0.2	5	5	5	5	20	40	80
MON 13280	0.3	10	10	10	10	40	50	90
MON 13280 + metribuzin & clim	0.3 + 0.28 & 0.047	15	15	15	15	80	80	100
MON 13280 + imep	0.3 + 0.063	15	15	15	15	90	90	100
Alachlor(65WDG)	3.0	0	0	0	0	30	40	50
Imazethapyr	0.063	0	0	0	0	90	80	50
Pendimethalin & imep	0.875 & 0.063	0	0	0	0	90	80	60
Imazethapyr + atra	0.063 + 1.5	90	90	90	90	100	90	100
V-53482	0.094	5	5	5	5	50	50	50

Table 3. Multi-species evaluation of soil-applied herbicides (Knake, Heisner, Paul, and Feltes).

Treatment	Rate	Gift	Yeft	Grft	Lacg	Bygr	Rrpw	Colq	Vele	Jiwe
		---------- control ----------								
PREPLANT INCORPORATED:	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Ethalfluralin + trif[2]	0.67 + 0.33	98	98	98	100	99	100	100	10	0
Trifluralin[2]	1.5	100	100	100	100	100	100	100	20	10
Trifluralin[3] + imep	1.0 + 0.063	100	100	100	100	100	100	100	98	99
Trifluralin[3]	1.0	98	98	98	98	98	100	100	10	0
Trifluralin[4]	1.0	98	98	98	90	98	100	100	10	0
Trifluralin[2] + metr & chlorimuron	1.0 + 0.28 & 0.047	98	98	98	97	100	100	100	98	95
Trifluralin[3] + metr & chlorimuron	1.0 + 0.28 & 0.047	98	98	98	97	100	100	100	98	95
Trifluralin[4] + metr & chlorimuron	1.0 + 0.28 & 0.047	98	98	98	97	100	100	100	98	95
Trifluralin[4] + metr & chlorimuron	1.0 + 0.35 & 0.035	98	98	98	98	100	100	100	98	95
Pendimethalin + imep	0.875 + 0.063	99	99	99	98	100	100	100	98	99
Trifluralin[2]	1.0	98	98	98	90	98	100	100	10	0
Trifluralin[4] + imep	1.0 + 0.063	99	98	98	90	100	100	100	98	90
Check		0	0	0	0	0	0	0	0	0
Trifluralin & imep	0.75 & 0.063	98	98	98	98	100	100	100	98	90
Trifluralin & DE 498	0.85 & 0.062	95	95	95	75	97	100	100	98	70
Trifluralin & DE 498	0.96 & 0.07	95	95	95	90	98	100	100	98	90
Trifluralin[4] & clom	0.75 & 0.75	95	95	95	85	97	100	100	100	60
Clomazone & trif	0.75 & 1.0	95	95	95	90	98	100	100	100	60
Butylate + atrazine	4.0 + 1.5	98	98	98	80	100	100	100	99	99
EPTC & dichlormid & diethOlate + atra	4.0 + 1.5	100	100	100	90	100	100	100	99	99
MON 8421 (acet)	2.0	96	96	96	90	99	100	100	98	98
MON 8421 + atra	2.0 + 1.5	98	98	98	93	99	100	100	99	99
ICIA 5676	2.0	96	96	96	90	99	100	100	97	98
ICIA 5676 + atra	2.0 + 1.5	98	98	98	93	99	100	100	98	99
EPTC & dichlormid & diethOlate + imep	4.0 + 0.063	80	80	80	95	95	100	100	99	98
Trifluralin[4] / imep + X-77 + 28%N	1.0 / 0.063 0.25% + 2%	95	95	95	100	100	100	100	95	98
Trifluralin[4] / bent & acifluorfen + 28%N	1.0 / 0.75 & 0.1675 + 4%	70	70	70	95	97	100	100	95	98
Trifluralin[4] / clim + thifensulfuron + X-77 + 28% N	1.0 / 0.004 + 0.004 + 0.25% + 2%	80	80	80	90	97	100	100	60	95
Trifluralin[4] / lact + COC[5]	1.0 / 0.2 + 1.0%	85	85	85	95	98	100	100	90	95
Trifluralin[4] / clim + COC + 28%N	1.0 / 0.008 + 1.0% + 2.0%	80	80	80	90	100	100	98	70	95
EPTC & dichlormid & dlat / nicosulfuron + COC + 28%N	4.0 / 0.031 + 1.0% + 4.0%	100	100	100	98	100	100	100	80	80
EPTC & dichlormid & dlat / primisulfuron+ COC + 28%N	4.0 / 0.036 + 1.0% + 4.0%	100	100	100	99	100	100	100	99	100
Pend & imazethapyr / lactofen + X-77 + 28%N	0.9 / 0.125 + 0.25% + 4.0%	98	98	98	100	100	100	100	99	100
Metolachlor & atra / primisulfuron + COC + 28%N	2.0 & 1.0 / 0.036 + 1.0% + 4.0%	100	100	100	98	100	100	100	97	100
Check		0	0	0	0	0	0	0	0	0
PREEMERGENCE:										
Metribuzin & clim	0.35 + 0.035	70	70	70	95	50	100	100	100	100
Metribuzin & clim	0.28 + 0.047	70	70	70	95	50	100	100	100	100
MON 8421 (acet)	2.0	99	99	99	100	100	100	100	50	100
MON 8421 + atrazine	2.0 + 1.5	100	100	100	100	100	100	100	50	100
ICIA 5676	2.0	100	100	100	100	100	100	100	30	100
ICIA 5676 + atrazine	2.0 + 1.5	100	100	100	100	100	100	100	80	100
MON 13280	0.2	75	75	75	100	10	100	100	50	80
MON 13280	0.3	80	80	80	100	20	100	100	80	90
MON 13280 + metribuzin & clim	0.3 + 0.28 & 0.047	98	98	98	100	98	100	100	100	100
MON 13280 + imep	0.3 + 0.063	95	95	95	100	95	100	100	99	100
Alachlor(65WDG)	3.0	99	99	99	100	100	100	100	50	90
Imazethapyr	0.063	95	95	95	100	95	100	100	99	100
Pendimethalin & imep	0.875 & 0.063	98	98	98	100	98	100	100	99	100
Imazethapyr + atra	0.063 + 1.5	96	96	96	100	95	100	100	100	100
V-53482	0.094	40	40	40	50	20	100	100	100	100

Table 4. Multi-species evaluation of soil-applied herbicides (Knake, Heisner, Paul, and Feltes).

Treatment	Rate	Tamg	Ilmg	Ebns	Cosf	Corw	Cocb	Fapa	Shca
		Control							
PREPLANT INCORPORATED:	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Ethalfluralin + trif[2]	0.67 + 0.33	60	60	50	0	5	10	99	99
Trifluralin[2]	1.5	60	60	0	0	0	20	100	99
Trifluralin[3] + imep	1.0 + 0.063	70	70	100	100	100	90	100	100
Trifluralin[3]	1.0	50	50	0	0	0	10	98	90
Trifluralin[4]	1.0	50	50	0	0	0	10	98	90
Trifluralin[2] + metr & chlorimuron	1.0 + 0.28 & 0.047	70	70	0	100	95	100	99	90
Trifluralin[3] + metr & chlorimuron	1.0 + 0.28 & 0.047	70	70	0	100	100	100	99	90
Trifluralin[4] + metr & chlorimuron	1.0 + 0.28 & 0.047	70	70	0	100	100	100	99	90
Trifluralin[4] + metr & chlorimuron	1.0 + 0.35 & 0.035	70	70	0	100	100	100	99	90
Pendimethalin & imep	0.875 & 0.063	70	70	100	100	90	80	99	95
Trifluralin[2]	1.0	50	50	0	0	0	10	98	90
Trifluralin[4] + imep	1.0 + 0.063	70	70	100	100	90	100	100	95
Check		0	0	0	0	0	0	0	0
Trifluralin & imep	0.75 & 0.063	70	70	100	100	90	90	99	95
Trifluralin & DE 498	0.85 & 0.062	50	50	90	50	90	60	90	90
Trifluralin & DE 498	0.96 & 0.07	60	60	95	60	95	75	95	90
Trifluralin[4] + clom	0.75 + 0.75	40	40	30	50	90	40	98	90
Clomazone & trif	0.75 & 1.0	50	50	30	50	90	40	99	90
Butylate + atrazine	4.0 + 1.5	80	80	100	100	100	90	99	40
EPTC & dichlormid & dietholate + atra	4.0 + 1.5	80	80	100	100	100	90	100	50
MON 8421 (acet)	2.0	50	50	100	10	95	40	98	70
MON 8421 + atra	2.0 + 1.5	80	80	100	100	100	70	99	80
ICIA 5676	2.0	60	60	100	10	95	40	98	70
ICIA 5676 + atra	2.0 + 1.5	85	85	100	100	100	90	99	80
EPTC & dichlormid & dietholate + imep	4.0 + 0.063	50	50	100	100	90	80	90	95
Trifluralin[4] / imep + X-77 + 28%N	1.0 / 0.063 0.25% + 2%	80	80	100	50	100	80	100	100
Trifluralin[4] / bent & acifluorfen + 28%N	1.0 / 0.75 & 0.1675 + 4%	80	90	100	70	100	100	90	95
Trifluralin[4] / clim + thifensulfuron + X-77 + 28% N	1.0 / 0.004 + 0.004 + 0.25% + 2%	60	60	0	80	100	90	90	90
Trifluralin[4]/lactofen + COC[5]	1.0 / 0.2 + 1.0%	70	90	100	100	100	100	95	93
Trifluralin[4] / clim + COC + 28%N	1.0 / 0.008 + 1.0% + 2.0%	70	80	0	80	90	90	90	98
EPTC & dichlormid & dlat / nicosulfuron + COC + 28%N	4.0 / 0.031 + 1.0% + 4.0%	70	80	95	0	85	80	100	99
EPTC & dichlormid & dlat / primisulfuron+ COC + 28%N	4.0 / 0.036 + 1.0% + 4.0%	80	80	100	100	100	95	100	100
Pend & imazethapyr / lactofen + X-77 + 28%N	0.88 & 0.063 / 0.125 + 0.25% + 4%	90	90	100	100	100	95	100	100
Metolachlor & atra / primisulfuron + COC + 28%N	2.0 & 1.0 / 0.036 + 1.0% + 4.0%	90	90	100	100	100	95	100	100
Check		0	0	0	0	0	0	0	0
PREEMERGENCE:									
Metribuzin & clim	0.35 & 0.035	50	80	0	50	100	90	90	90
Metribuzin & clim	0.28 + 0.047	90	90	0	50	100	90	90	90
MON 8421 (acet)	2.0	30	10	100	10	100	30	100	70
MON 8421 + atrazine	2.0 + 1.5	80	80	100	100	100	90	100	80
ICIA 5676	2.0	30	10	100	10	100	30	100	70
ICIA 5676 + atrazine	2.0 + 1.5	90	100	100	100	100	90	100	80
MON 13280	0.2	60	60	100	0	85	20	90	90
MON 13280	0.3	70	70	100	0	90	30	90	95
MON 13280 + metribuzin & clim	0.3 + 0.28 & 0.047	90	90	100	100	100	100	100	100
MON 13280 + imep	0.3 + 0.063	90	90	100	90	100	50	100	100
Alachlor(65WDG)	3.0	40	40	100	0	100	50	100	50
Imazethapyr	0.063	90	90	100	100	100	20	95	98
Pendimethalin & imep	0.875 & 0.063	90	90	100	100	100	50	100	99
Imazethapyr + atra	0.063 + 1.5	90	100	100	100	100	100	100	99
V-53482	0.094	80	90	100	100	100	50	50	50

Table 5. Multi-species evaluation of soil-applied herbicides (Knake, Heisner, Paul, and Feltes).

Treatment	Rate	Oats Ogle	Wheat Caldwell	Alfalfa Magnum	Red Clover Ruby	Canola Cascade
		---------Injury---------				
PREPLANT INCORPORATED:	(lb/A)	(%)	(%)	(%)	(%)	(%)
Ethalfluralin + trif[2]	0.67 + 0.33	90	90	5	5	20
Trifluralin[2]	1.5	90	90	10	20	10
Trifluralin[3] + imep	1.0 + 0.063	95	75	10	50	100
Trifluralin[3]	1.0	90	70	5	15	30
Trifluralin[4]	1.0	90	70	5	15	40
Trifluralin[2] + metr & chlorimuron	1.0 + 0.28 & 0.047	99	90	80	100	100
Trifluralin[3] + metr & chlorimuron	1.0 + 0.28 & 0.047	99	90	80	100	100
Trifluralin[4] + metr & chlorimuron	1.0 + 0.28 & 0.047	99	90	80	100	100
Trifluralin[4] + metr & chlorimuron	1.0 + 0.35 & 0.035	99	90	80	100	100
Pendimethalin + imep	0.875 + 0.063	95	75	10	80	100
Trifluralin[2]	1.0	90	70	5	50	10
Trifluralin[4] + imep	1.0 + 0.063	95	75	10	40	100
Check		0	0	0	0	0
Trifluralin & imep	0.75 & 0.063	90	80	10	40	100
Trifluralin & DE 498	0.85 & 0.062	80	70	10	40	100
Trifluralin & DE 498	0.96 & 0.07	80	70	20	70	100
Trifluralin[4] + clom	0.75 + 0.75	90	80	40	80	10
Clomazone & trif	0.75 & 1.0	90	80	45	85	10
Butylate + atrazine	4.0 + 1.5	99	99	100	100	100
EPTC & dichlormid & diethOlate + atra	4.0 + 1.5	100	100	100	100	100
MON 8421 (acet)	2.0	75	75	70	100	85
MON 8421 + atra	2.0 + 1.5	85	85	95	100	100
ICIA 5676	2.0	80	80	40	100	85
ICIA 5676 + atra	2.0 + 1.5	90	90	100	100	100
EPTC & dichlormid & diethOlate + imep	4.0 + 0.063	90	75	10	85	100
Trifluralin[4] / imep + X-77 + 28%N	1.0 / 0.063 0.25% + 2%	85	80	5	40	100
Trifluralin[4] / bent & acifluorfen + 28%N	1.0 / 0.75 & 0.1675 + 4%	80	65	75	90	40
Trifluralin[4] / clim + thifensulfuron + X-77 + 28% N	1.0 / 0.004 + 0.004 + 0.25% + 2%	75	60	10	90	40
Trifluralin[4]/lactofen + COC[5]	1.0 / 0.2 + 1.0%	80	70	100	100	50
Trifluralin[4] / clim + COC + 28%N	1.0 / 0.008 + 1.0% + 2%	80	60	15	90	70
EPTC & dichlormid & dlat / nicosulfuron + COC + 28%N	4.0 / 0.031 + 1.0% + 4%	100	100	20	80	40
EPTC & dichlormid & dlat / primisulfuron+ COC + 28%N	4.0 / 0.036 + 1.0% + 4%	100	100	50	90	50
Pend & imazethapyr / lactofen + X-77 + 28%N	0.88 & 0.063 / 0.125 + 0.25% + 4%	90	80	90	98	60
Metolachlor & atra / primisulfuron + COC + 28%N	2.0 & 1.0 / 0.036 + 1.0% + 4.0%	99	99	100	100	100
Check		0	0	0	0	100
PREEMERGENCE:						
Metribuzin & clim	0.35 & 0.035	75	65	85	100	100
Metribuzin & clim	0.28 & 0.047	80	70	90	100	100
MON 8421 (acet)	2.0	70	60	75	100	90
MON 8421 + atrazine	2.0 + 1.5	80	70	100	100	100
ICIA 5676	2.0	70	60	75	100	80
ICIA 5676 + atrazine	2.0 + 1.5	90	80	100	100	100
MON 13280	0.2	20	20	75	90	80
MON 13280	0.3	30	30	80	98	90
MON 13280 + metribuzin & clim	0.3 + 0.28 & 0.047	90	90	99	100	100
MON 13280 + imep	0.3 + 0.063	70	60	80	100	100
Alachlor(65WDGO	3.0	50	40	60	100	50
Imazethapyr	0.063	80	70	10	90	100
Pendimethalin & imep	0.875 & 0.063	90	80	60	90	100
Imazethapyr + atra	0.063 + 1.5	95	90	100	100	100
V-53482	0.094	50	50	100	100	100

[1]Independent Professional Seedsmen Association.
[2]Treflan 4EC from Dow-Elanco.
[3]Trilin GRP 80 DF from Griffin.
[4]Trific 60DF from Terra International.
[5]COC - crop oil concentrate with 83% paraffin base petroleum oil, 16% surfactant, and 1% inert.

Multi-species evaluation of postemergence herbicides. Knake, Ellery L., Ronald W. Heisner, Lyle E. Paul, and Joe D. Walsh. The purpose of this study was to evaluate the degree of crop tolerance and weed control for most crops and annual weed species common to Illinois with herbicides applied postemergence.

Location:	DeKalb SW800	Organic matter:	5 to 6%	Slope:	1 to 2%
Plot size:	10 X 150 ft	Soil pH:	6.3	Planting date:	April 23, 1991
Drainage:	fair	Soil type:	Drummer silty clay loam	Row spacing:	30 inch and 5 ft

Tillage: residue chopped August 6, 1990; disked August 30, 1990; field cultivated October 13, 1990; disked and harrowed April 22, 1991. A tractor mounted compressed air sprayer was used traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was ten feet with nozzles spaced 20 inches apart and 20 inches above the soil surface.

Date:	May 23, 1991	Temperature (F)		Soil moisture:	moist
Treatment:	Postemergence	air:	75	Wind (mph):	12 NNE
Time:	12:15 pm	soil under sod		Sky (% overcast):	60
Rainfall (inch)		4 inch:	65	Relative	
previous week:	0.82			humidity (%):	85
following week:	4.42				

Corn		Large crabgrass		Common sunflower	
leaf no.	3	leaf no.	1	leaf no.	2
height (inch)	6	height (inch)	1	height (inch)	3
Soybean		Barnyardgrass		Common ragweed	
leaf no.	1st trif	leaf no.	2	leaf no.	4
height (inch)	5	height (inch)	3	height (inch)	2
Sunflower		Redroot pigweed		Giant ragweed	
leaf no.	4	leaf no.	2	leaf no.	2
height (inch)	6	height (inch)	1	height (inch)	1.5
Sorghum		Common lambsquarters		Fall panicum	
leaf no.	2	leaf no.	2	leaf no.	2
height (inch)	3	height (inch)	1	height (inch)	2
Hairy vetch		Velvetleaf		Shattercane	
leaf no.	4	leaf no.	4	leaf no.	2
height (inch)	2	height (inch)	2	height (inch)	2
Common cocklebur		Jimsonweed		Canola	
leaf no.	3	leaf no.	2	leaf no.	4
height (inch)	2.5	height (inch)	1.5	height (inch)	4
Giant foxtail		Tall morningglory		Oats	
leaf no.	2	leaf no.	2	leaf no.	4
height (inch)	2	height (inch)	1.5	height (inch)	6
Yellow foxtail		Ivyleaf morningglory		Wheat	
leaf no.	2	leaf no.	2	leaf no.	4
height (inch)	3	height (inch)	1.5	height (inch)	4
Green foxtail		Eastern black nightshade		Alfalfa	
leaf no.	2	leaf no.	cotyl	leaf no.	2
height (inch)	2	height (inch)	1	height (inch)	1
				Red clover	
				leaf no.	3
				height (inch)	1.5

The dry water soluble crystals of the dimethylamine salt of 2,4-D performed in a very similar manner as the liquid formulation of the dimethylamine salt at comparable rate. The dry formulation could offer some convenience. The combination of 2,4-D and atrazine provided weed control very similar to dicamba and atrazine. Although corn tolerance appeared to be relatively adequate in this trial, previous experience suggests some caution.

Corn exhibited good tolerance to pyridate and to CL 23601 except for slight effect when pyridate was mixed with cyanazine. Spectrum of control for pyridate combined with atrazine or cyanazine and for CL 23601 combined with atrazine was quite broad for both grass and broadleaf weeds. Pyridate or CL 23601 combined with nicosulfuron or primisulfuron provided good corn tolerance and fairly broad spectrum weed control with spectrum depending somewhat on the relative strength of nicosulfuron and primisulfuron with nicosulfuron more effective on most grass weeds and primisulfuron more effective on some broadleaf weeds. Although pyridate plus

sethoxydim provided good weed control, crop tolerance appeared too limited for this combination to be promising for newly established alfalfa or any other crop included in the study.

A low rate of metribuzin plus bentazon provided good control of broadleaf weeds with only slight effect noted on corn. Similarly, a low rate of metribuzin with 2,4-D dimethylamine or butoxyethyl ester provided excellent broadleaf weed control with little effect on corn.

Sethoxydim plus bentazon and acifluorfen gave excellent broad spectrum weed control with minimal effect on soybeans.

Comparison of various adjuvants with imazethapyr indicated Dash (an adjuvant from BASF) and Sunit II (a methylated seed oil) to be quite similar in performance and both slightly more effective than X-77 (an adjuvant from Valent).

Under the conditions of this study, 0.125 lb/A of fluazifop-P was nearly as effective as 0.188 lb/A. Fluazifop-P plus fenoxaprop gave excellent control of all grasses, including "volunteer" corn. The same combination plus fomesafen provided excellent broad spectrum control of both grass and broadleaf weeds except common lambsquarters and control of it was improved by addition of a dimethylamine formulation of 2,4-DB. Flazifop-P plus fomesafen also provided excellent control of nearly all grass and broadleaf weeds.

With the exception of annual morningglories, combinations of imazethapyr plus nicosulfuron or primisulfuron provided excellent broad spectrum weed control but excessive corn injury indicated that an imazethapyr tolerant line would be needed. Except for weakness on large crabgrass, nicosulfuron gave very good control of grass weeds. Primisulfuron was less effective than nicosulfuron on most grass species and especially weak on large crabgrass and barnyardgrass. However, primisulfuron was more effective on several broadleaf weed species than nicosulfuron, including common cocklebur, velvetleaf, jimsonweed, eastern black nightshade, and common sunflower.

With these contrasting characteristics, various ratios of nicosulfuron plus primisulfuron were tried. Using a half rate of each provided excellent broad spectrum weed control except for only partial control of annual morningglories, moderate control of velvetleaf and poor control of large crabgrass. Other ratios appeared to have little or no advantage. One of the most dramatic observations was the tolerance of sulfonylurea tolerant soybeans to both nicosulfuron and primisulfuron alone or in combination.

Reducing the rate of nicosulfuron from 0.031 lb/A to 0.024 lb/A and comparing X-77 with 28% UAN for nicosulfuron plus bromoxynil indicated little significant difference with all treatments being quite effective. Addition of bromoxynil to nicosulfuron or DPX-79406 significantly improved control of common cocklebur, velvetleaf, annual morningglories, common ragweed, common sunflower and eastern black nightshade. (Dept. of Agronomy, University of Illinois, Urbana.)

Table 1. Multi-species evaluation of postemergence herbicides (Knake, Heisner, Paul, and Walsh).

Treatment	Rate	IPSA[1] Corn varieties C1128	C1284	C4843	C6114	C6973	C8004	Soybeans Archer	Bell
		injury							
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
2,4-D[2]	0.47	0	0	0	0	0	0	50	50
2,4-D[3]	0.22	0	0	0	0	0	0	30	30
2,4-D[3]	0.44	0	0	0	0	0	0	50	50
2,4-D[3]	0.88	10	0	0	10	0	0	70	70
Atrazine & 2,4-D	0.56 & 0.25	0	0	0	0	0	0	90	90
Atra & 2,4-D	0.84 & 0.375	10	0	0	0	0	0	95	95
Atra & banvel	0.47 & 0.92	0	0	0	0	10	0	95	95
Pyridate + atra	0.9 + 1.0	0	0	0	0	0	0	95	95
CL 23601 + atra	0.9 + 1.0	0	0	0	0	0	0	95	95
Pydt + cyanazine	0.9 + 1.2	5	5	5	5	5	5	90	90
Pydt + nicosulfuron[4]	0.7 + 0.031	0	0	0	0	10	0	75	75
Pydt + primisulfuron[4]	0.45 + 0.036	0	0	0	0	0	0	80	80
Check		0	0	0	0	0	0	0	0
CL 23601 + nicosulfuron[4]	0.7 +0.031	0	0	0	0	0	0	70	70
CL 23601 + primisulfuron[4]	0.45 + 0.036	0	0	0	0	0	0	75	75
Pydt + sethoxydim + COC[5]	0.9 + 0.188 + 1%	80	80	80	80	80	80	60	60
Metribuzin + bentazon[4]	0.076 + 0.5	10	0	5	5	0	10	20	20
Metr + 2,4-D[6]	0.09 + 0.16	0	5	0	0	0	0	50	50
Metr + 2,4-D[2]	0.09 + 0.25	0	0	10	0	0	0	30	30
Quizalofop + clorimuron+ thifensulfuron + 28% N[4]	0.044 + 0.004 + 0.004 + 4%	100	100	100	100	100	100	10	10
Seth + bent & acifluorfen + 28% N	0.188 + 0.75 & 0.17 4%	85	85	85	85	85	85	10	10
Seth + bent & acif + thif + 28% N[4]	0.188 + 0.75 & 0.17 0.004 + 4%	85	85	85	85	85	85	10	10
Imazethapyr + 28% N[4]	0.063 + 1%	30	30	30	30	30	30	0	0
Imep + Dash[7] + 28% N	0.063 + 1% + 1%	50	50	60	50	50	60	0	0
Imazethapyr + Sunit[8] + 28% N	0.063 + 1% + 1%	40	40	50	50	50	60	0	0
Pendimethalin & imep + Sunit[8] + 28% N	0.88 & 0.063 1% + 1%	40	40	50	50	50	60	0	0
Seth + Flfp-P + bentazon + COC + 28% N	0.125 + 0.016 + 1.0 + 1% + 4%	90	90	90	90	90	90	2	2
Fluazifop-P + COC	0.125 + 1%	100	100	100	100	100	100	0	0
Flfp-P + COC	0.188 + 1%	100	100	100	100	100	100	0	0
Flfp-P & fenoxaprop + COC	0.125 & 0.035 + 1%	100	100	100	100	100	100	0	0
Flfp-P & fenx + fomesafen + COC	0.125 & 0.035 + 0.25 + 1%	100	100	100	100	100	100	2	2
Flfp-P & fenx + fome + 2,4-DB[2] + COC	0.125 & 0.035 + 0.25 + 0.031 + 1%	100	100	100	100	100	100	5	5
Flfp-P & fenx + fome + 2,4-DB[2] + bentazon + 28% N[4]	0.125 & 0.035 + 0.125 + 0.031 + 0.5 + 4%	100	100	100	100	100	100	5	5
Flfp-P & fenx + fome + thif[4]	0.125 & 0.035 + 0.25 + 0.004	100	100	100	100	100	100	2	2
Flfp-P & fome + COC	0.25 & 0.188 + 1%	100	100	100	100	100	100	2	2
Imep + nicosulfuron[4]	0.063 + 0.016	50	50	60	50	40	30	20	20
Imep + primisulfuron[4]	0.063 + 0.018	50	50	60	50	40	40	50	50
Nicosulfuron + COC	0.031 + 1%	0	0	0	0	0	0	50	50
Check		0	0	0	0	0	0	0	0
Primisulfuron + COC	0.036 + 1%	10	10	10	10	0	10	60	60
Nicosulfuron + primisulfuron + COC	0.016 + 0.018 + 1%	20	20	20	20	10	5	60	60
Nicosulfuron + primisulfuron + COC	0.008 + 0.027 + 1%	10	10	10	10	5	10	60	60
Nicosulfuron + primisulfuron + COC	0.024 + 0.09 + 1%	10	10	10	5	5	10	50	50
Nicosulfuron + primisulfuron + COC	0.024 + 0.027 + 1%	10	20	10	10	20	10	70	70
Bromoxynil + nicosulfuron[4]	0.25 + 0.024	0	0	0	0	0	0	85	85
Brox + nicosulfuron[4]	0.25 + 0.031	0	0	0	10	0	0	90	90
Brox + nicosulfuron + 28% N	0.25 + 0.031 + 2%	10	0	0	0	0	0	90	90
Brox + atra + nicosulfuron[4]	0.25 + 0.5 + 0.031	0	0	0	0	0	0	100	100
DPX-79406 + 28% N[4]	0.024 + 4%	0	0	0	5	0	0	80	80
DPX-79406 + brox[4]	0.016 + 0.25	0	0	0	0	0	0	80	80

Table 2. Multi-species evaluation of postemergence herbicides (Knake, Heisner, Paul, and Walsh)

Treatment	Rate	Soybeans					Sun-flower	Sorghum	Sorghum
		Chapman	Jack	Kunitz	Williams 82	Williams 82 STS			CGA-13205
		injury							
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
2,4-D[2]	0.47	50	50	50	50	50	80	2	2
2,4-D[3]	0.22	30	30	30	30	30	60	1	1
2,4-D[3]	0.44	50	50	50	50	50	70	2	2
2,4-D[3]	0.88	70	70	70	70	70	85	3	3
Atrazine & 2,4-D	0.56 & 0.25	90	90	90	90	90	90	10	10
Atra & 2,4-D	0.84 & 0.375	95	95	95	95	95	95	20	20
Atra & banvel	0.47 & 0.92	95	95	95	95	95	90	0	0
Pyridate + atra	0.9 + 1.0	95	95	95	95	95	100	20	20
CL 23601 + atra	0.9 + 1.0	95	95	95	95	95	100	30	30
Pydt + cyanazine	0.9 + 1.2	90	90	90	90	90	100	50	50
Pydt + nicosulfuron[4]	0.7 + 0.031	75	75	75	75	75	50	95	95
Pydt + primisulfuron[4]	0.45 + 0.036	80	80	80	80	60	80	95	95
Check		0	0	0	0	0	0	0	0
CL 23601 + nicosulfuron[4]	0.7 +0.031	70	70	70	70	70	50	95	95
CL 23601 + primisulfuron[4]	0.45 + 0.036	75	75	75	75	55	80	95	95
Pydt + sethoxydim + COC	0.9 + 0.188 + 1%	60	60	60	60	60	40	90	90
Metribuzin + bentazon[4]	0.076 + 0.5	20	20	20	20	25	70	0	0
Metr + 2,4-D[6]	0.09 + 0.16	50	50	50	50	60	70	0	0
Metr + 2,4-D[2]	0.09 + 0.25	30	30	30	30	40	70	0	0
Quizalofop + chlorimuron thifensulfuron + 28% N[4]	0.044 + 0.004 + 0.004 + 4%	10	10	10	10	5	90	100	100
Seth + bent & acifluorfen + 28% N	0.188 + 0.75 & 0.17 4%	10	10	10	10	10	60	96	96
Seth + bent & acif + thif + 28% N[4]	0.188 + 0.75 & 0.17 0.004 + 4%	10	10	10	10	5	90	96	96
Imazethapyr + 28% N[4]	0.063 + 1%	0	0	0	0	0	80	97	97
Imep + Dash[7] + 28% N	0.063 + 1% + 1%	0	0	0	0	0	85	99	99
Imep + Sunit[8] + 28% N	0.063 + 1% + 1%	0	0	0	0	0	85	99	99
Pendimethalin & imep + Sunit[8] + 28% N	0.88 & 0.063 1% + 1%	0	0	0	0	0	83	99	99
Seth + Flfp-P + bentazon + COC + 28% N	0.125 + 0.016 + 1.0 + 1% + 4%	2	2	2	2	2	60	98	98
Fluazifop-P + COC	0.125 + 1%	0	0	0	0	0	0	100	100
Flfp-P + COC	0.188 + 1%	0	0	0	0	0	5	100	100
Flfp-P & fenoxaprop + COC	0.125 & 0.035 + 1%	0	0	0	0	0	0	100	100
Flfp-P & fenx + fomesafen + COC	0.125 & 0.035 + 0.25 + 1%	2	2	2	2	2	85	100	100
Flfp-P & fenx + fome + 2,4-DB[2] + COC	0.125 & 0.035 + 0.25 + 0.031 + 1%	5	5	5	5	5	80	100	100
Flfp-P & fenx + fome + 2,4-DB[2] + bentazon + 28% N[4]	0.125 & 0.035 + 0.125 + 0.031 + 0.5 + 4%	5	5	5	5	5	60	99	99
Flfp-P & fenx + fome + thif[4]	0.125 & 0.035 + 0.25 + 0.004	2	2	2	2	2	85	100	100
Flfp-P & fome + COC	0.25 & 0.188 + 1%	2	2	2	2	2	90	100	100
Imep + nicosulfuron[4]	0.063 + 0.016	20	20	20	20	20	90	99	99
Imep + primisulfuron[4]	0.063 + 0.018	50	50	50	50	30	95	99	99
Nicosulfuron + COC	0.031 + 1%	50	60	40	60	10	50	99	99
Check		0	0	0	0	0	0	0	0
Nicosulfuron + COC	0.036 + 1%	60	60	60	70	10	98	98	98
Nicosulfuron + primisulfuron + COC	0.016 + 0.018 + 1%	60	60	60	60	20	95	99	99
Nicosulfuron + primisulfuron + COC	0.008 + 0.027 + 1%	70	60	60	60	20	97	99	99
Nicosulfuron + primisulfuron + COC	0.024 + 0.09 + 1%	50	50	50	50	10	85	99	99
Nicosulfuron + primisulfuron + COC	0.024 + 0.027 + 1%	70	70	70	70	30	98	99	99
Bromoxynil + nicosulfuron[4]	0.25 + 0.024	85	85	85	85	85	98	99	99
Brox + nicosulfuron[4]	0.25 + 0.031	90	90	90	90	90	98	99	99
Brox + nicosulfuron 28% N	0.25 + 0.031 + 2%	90	90	90	90	90	100	99	99
Brox + atra + nicosulfuron[4]	0.25 + 0.5 + 0.031	100	100	100	100	100	100	99	99
DPX-79406 + 28% N[4]	0.024 + 4%	80	80	80	80	30	80	99	99
DPX-79406 + brox[4]	0.016 + 0.25	80	80	80	80	80	70	99	99

Table 3. Multi-species evaluation of postemergence herbicides (Knake, Heisner, Paul, and Walsh).

Treatment	Rate	Canola Cascade	Oats Ogle	Wheat Caldwell	Alfalfa Magnum	Red Clover Ruby	Hairy vetch	Gift	Yeft
		injury						control	
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
2,4-D[2]	0.47	80	10	0	90	90	100	0	0
2,4-D[3]	0.22	70	5	0	80	80	100	0	0
2,4-D[3]	0.44	80	10	0	90	90	100	0	0
2,4-D[3]	0.88	85	20	0	100	95	100	0	0
Atrazine & 2,4-D	0.56 & 0.25	95	10	20	100	100	100	10	10
Atra & 2,4-D	0.84 & 0.375	100	20	30	100	100	100	20	20
Atra & banvel	0.47 & 0.92	50	10	30	100	100	100	30	30
Pyridate + atra	0.9 + 1.0	80	12	50	100	100	100	99	97
CL 23601 + atra	0.9 + 1.0	80	40	60	100	100	100	97	97
Pydt + cyanazine	0.9 + 1.2	80	30	50	100	100	100	100	100
Pydt + nicosulfuron[4]	0.7 + 0.031	85	95	93	80	85	98	95	90
Pydt + primisulfuron[4]	0.45 + 0.036	85	90	90	90	95	98	70	60
Check		0	0	0	0	0	0	0	0
CL 23601 + nicosulfuron[4]	0.7 + 0.031	90	100	93	70	85	95	99	90
CL 23601 + primisulfuron[4]	0.45 + 0.036	80	90	90	80	95	97	80	50
Pydt + sethoxydim + COC	0.9 + 0.188 + 1%	40	90	60	40	70	95	99	95
Metribuzin + bentazon[4]	0.076 + 0.5	100	0	40	50	100	50	0	0
Metr + 2,4-D[6]	0.09 + 0.16	85	0	0	90	100	100	0	0
Metr + 2,4-D[2]	0.09 + 0.25	75	0	0	80	100	100	0	0
Quizalofop + chlorimuron thifensulfuron + 28% N[4]	0.044 + 0.004 + 0.004 + 4%	80	95	100	50	100	95	100	50
Seth + bent & acifluorfen + 28% N	0.188 + 0.75 & 0.17 4%	99	100	95	100	100	80	100	100
Seth + bent & acif + thif + 28% N[4]	0.188 + 0.75 & 0.17 0.004 + 4%	98	100	100	90	100	99	100	100
Imazethapyr + 28% N[4]	0.063 + 1%	79	90	80	10	45	10	93	93
Imep + Dash[7] + 28% N	0.063 + 1% + 1%	85	90	83	15	50	10	95	95
Imep + Sunit[8] + 28% N	0.063 + 1% + 1%	80	90	85	20	45	10	95	95
Pendimethalin & imep + Sunit[8] + 28% N	0.88 & 0.063 1% + 1%	85	90	85	10	40	10	93	93
Seth + Flfp-P + bentazon + COC + 28% N	0.125 + 0.016 + 1.0 + 1% + 4%	100	95	80	50	50	20	92	92
Fluazifop-P + COC	0.125 + 1%	0	100	99	0	0	0	87	87
Flfp-P + COC	0.188 + 1%	0	100	100	0	0	0	90	90
Flfp-P & fenoxaprop + COC	0.125 & 0.035 + 1%	0	100	100	0	0	0	100	100
Flfp-P & fenx + fomesafen + COC	0.125 & 0.035 + 0.25 + 1%	99	100	100	70	90	90	100	100
Flfp-P & fenx + fome + 2,4-DB[2] + COC	0.125 & 0.035 + 0.25 + 0.031 + 1%	100	100	100	70	90	90	100	100
Flfp-P & fenx + fome + 2,4-DB[2] + bentazon + 28% N[4]	0.125 & 0.035 + 0.125 + 0.031 + 0.5 + 4%	100	100	100	80	90	90	100	100
Flfp-P & fenx + fome + thif[4]	0.125 & 0.035 + 0.25 + 0.004	90	100	99	85	90	90	100	100
Flfp-P & fome + COC	0.25 & 0.188 + 1%	100	100	100	70	90	90	100	100
Imep + nicosulfuron[4]	0.063 + 0.016	80	98	99	50	70	10	98	99
Imep + primisulfuron[4]	0.063 + 0.018	80	98	99	60	80	80	95	98
Nicosulfuron + COC	0.031 + 1%	75	98	99	50	80	60	99	99
Check		0	0	0	0	0	0	0	0
Primisulfuron + COC	0.036 + 1%	75	98	99	60	95	90	98	98
Nicosulfuron + primisulfuron + COC	0.016 + 0.018 + 1%	80	98	99	60	80	90	100	100
Nicosulfuron + primisulfuron + COC	0.008 + 0.027 + 1%	80	98	99	60	80	90	98	100
Nicosulfuron + primisulfuron + COC	0.024 + 0.09 + 1%	80	98	99	60	80	80	99	100
Nicosulfuron + primisulfuron + COC	0.024 + 0.027 + 1%	80	98	99	70	90	90	100	100
Bromoxynil + nicosulfuron[4]	0.25 + 0.024	95	98	95	70	100	100	100	100
Brox + nicosulfuron[4]	0.25 + 0.031	90	98	95	75	100	100	100	100
Brox + nicosulfuron 28% N	0.25 + 0.031 + 2%	80	98	95	80	100	100	100	100
Brox + atra + nicosulfuron[4]	0.25 + 0.5 + 0.031	95	95	99	90	100	100	99	100
DPX-79406 + 28% N[4]	0.024 + 4%	80	98	95	70	100	80	98	100
DPX-79406 + brox[4]	0.016 + 0.25	90	98	95	80	100	100	100	100

Table 4. Multi-species evaluation of postemergence herbicides (Knake, Heisner, Paul, and Walsh).

Treatment	Rate	Grft	Lacg	Bygr	Fapa	Shca	Rrpw	Colq	Vele
		control							
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
2,4-D[2]	0.47	0	0	0	0	0	100	100	90
2,4-D[3]	0.22	0	0	0	0	0	100	100	87
2,4-D[3]	0.44	0	0	0	0	0	100	100	90
2,4-D[3]	0.88	0	0	0	0	0	100	100	93
Atrazine & 2,4-D	0.56 & 0.25	10	0	10	10	5	100	100	95
Atra & 2,4-D	0.84 & 0.375	20	0	20	20	10	100	100	100
Atra & banvel	0.47 & 0.92	30	0	20	40	5	100	100	98
Pyridate + atra	0.9 + 1.0	99	30	50	60	20	100	100	93
CL 23601 + atra	0.9 + 1.0	95	30	80	60	20	100	100	99
Pydt + cyanazine	0.9 + 1.2	97	100	70	99	30	100	100	100
Pydt + nicosulfuron[4]	0.7 + 0.031	95	70	95	80	100	100	100	60
Pydt + primisulfuron[4]	0.45 + 0.036	80	0	40	100	100	100	100	80
Check		0	0	0	0	0	0	0	0
CL 23601 + nico[4]	0.7 + 0.031	98	70	99	100	99	100	100	70
CL 23601 + prim[4]	0.45 + 0.036	80	0	30	70	100	100	100	90
Pydt + sethoxydim + COC	0.9 + 0.188 + 1%	98	99	100	100	100	100	100	60
Metribuzin + bentazon[4]	0.076 + 0.5	0	0	0	0	5	100	100	100
Metr + 2,4-D[6]	0.09 + 0.16	0	0	0	0	0	100	100	100
Metr + 2,4-D[2]	0.09 + 0.25	0	0	0	0	0	100	100	100
Quizalofop + chlorimuron thifensulfuron + 28% N[4]	0.044 + 0.004 + 0.004 + 4%	98	85	90	100	100	100	100	90
Seth + bent & acifluorfen + 28% N	0.188 + 0.75 & 0.17 4%	100	98	100	100	100	100	100	100
Seth + bent & acif + thif + 28% N[4]	0.188 + 0.75 & 0.17 0.004 + 4%	100	99	100	100	100	100	100	99
Imazethapyr + 28% N[4]	0.063 + 1%	93	100	99	98	98	100	100	90
Imep + Dash[7] + 28% N	0.063 + 1% + 1%	95	100	100	100	100	100	100	96
Imep + Sunit[8] + 28% N	0.063 + 1% + 1%	95	99	100	100	100	100	100	93
Pendimethalin & imep + Sunit[8] + 28% N	0.88 & 0.063 1% + 1%	93	100	100	99	99	100	100	90
Seth + Flfp-P + bentazon + COC + 28% N	0.125 + 0.016 + 1.0 + 1% + 4%	92	99	98	98	98	80	100	99
Fluazifop-P + COC	0.125 + 1%	87	98	100	98	98	0	0	0
Flfp-P + COC	0.188 + 1%	90	100	100	99	100	0	0	0
Flfp-P & fenoxaprop + COC	0.125 & 0.035 + 1%	100	98	100	100	99	0	0	0
Flfp-P & fenx + fomesafen + COC	0.125 & 0.035 + 0.25 + 1%	100	98	100	100	100	100	80	97
Flfp-P & fenx + fome + 2,4-DB[2] + COC	0.125 & 0.035 + 0.25 + 0.031 + 1%	100	98	100	100	100	100	90	98
Flfp-P & fenx + fome + 2,4-DB[2] + bentazon + 28% N[4]	0.125 & 0.035 + 0.125 + 0.031 + 0.5 + 4%	98	98	100	100	100	100	100	99
Flfp-P & fenx + fome + thif[4]	0.125 & 0.035 + 0.25 + 0.004	99	98	100	100	100	100	99	100
Flfp-P & fome + COC	0.25 & 0.188 + 1%	99	98	100	100	100	100	99	100
Imep + nicosulfuron[4]	0.063 + 0.016	98	100	100	100	100	100	99	60
Imep + primisulfuron[4]	0.063 + 0.018	96	99	100	100	100	100	100	99
Nicosulfuron + COC	0.031 + 1%	96	70	100	100	99	100	100	30
Check		0	0	0	0	0	0	0	0
Primisulfuron + COC	0.036 + 1%	90	0	0	90	100	100	99	90
Nicosulfuron + primisulfuron + COC	0.016 + 0.018 + 1%	100	30	99	99	100	100	100	80
Nicosulfuron + primisulfuron + COC	0.008 + 0.027 + 1%	100	10	95	96	100	100	100	90
Nicosulfuron + primisulfuron + COC	0.024 + 0.09 + 1%	100	50	99	99	100	100	100	60
Nicosulfuron + primisulfuron + COC	0.024 + 0.027 + 1%	100	50	99	100	100	100	100	85
Bromoxynil + nico[4]	0.25 + 0.024	100	90	99	100	100	100	100	100
Brox + nico[4]	0.25 + 0.031	100	90	99	100	100	100	100	100
Brox + nicosulfuron 28% N	0.25 + 0.031 + 2%	100	90	99	100	100	100	100	100
Brox + atra + nicosulfuron[4]	0.25 + 0.5 + 0.031	100	100	99	100	100	100	100	100
DPX-79406 + 28% N[4]	0.024 + 4%	100	95	99	100	100	100	100	50
DPX-79406 + brox[4]	0.016 + 0.25	98	90	90	100	100	100	100	99

Table 5. Multi-species evaluation of postemergence herbicides (Knake, Heisner, Paul, and Walsh).

Treatment	Rate	Jiwe	Tamg	Ilmg	Corw	Cosf	Ebns	Cocb
		control						
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
2,4-D[2]	0.47	90	99	99	100	100	100	100
2,4-D[3]	0.22	50	97	97	100	100	100	100
2,4-D[3]	0.44	90	99	99	100	100	100	100
2,4-D[3]	0.88	100	100	100	100	100	100	100
Atrazine & 2,4-D	0.56 & 0.25	100	100	100	100	100	100	100
Atra & 2,4-D	0.84 & 0.375	100	100	100	100	100	100	100
Atra & banvel	0.47 & 0.92	100	100	100	100	100	100	100
Pyridate + atra	0.9 + 1.0	100	98	100	100	100	100	100
CL 23601 + atra	0.9 + 1.0	100	99	100	100	100	100	100
Pydt + cyanazine	0.9 + 1.2	100	98	100	100	100	100	100
Pydt + nicosulfuron[4]	0.7 + 0.031	95	93	93	50	100	100	100
Pydt + primisulfuron[4]	0.45 + 0.036	100	80	80	100	100	100	100
Check		0	0	0	0	0	0	0
CL 23601 + nico[4]	0.7 + 0.031	95	95	95	100	100	100	100
CL 23601 + prim[4]	0.45 + 0.036	100	80	80	100	100	100	100
Pydt + sethoxydim + COC	0.9 + 0.188 + 1% COC	10	80	80	100	90	100	98
Metribuzin + bentazon[4]	0.076 + 0.5	100	80	80	100	100	100	98
Metr + 2,4-D[6]	0.09 + 0.16	100	90	90	100	100	100	95
Metr + 2,4-D[2]	0.09 + 0.25	100	100	100	100	100	100	100
Quizalofop + chlorimuron thifensulfuron + 28% N[4]	0.044 + 0.004 + 0.004 + 4%	20	80	80	70	100	0	100
Seth + bent & acifluorfen + 28% N	0.188 + 0.75 & 0.17 4%	90	90	100	95	100	100	100
Seth + bent & acif + thif + 28% N[4]	0.188 + 0.75 & 0.17 0.004 + 4%	90	90	100	100	100	100	99
Imazethapyr + 28% N[4]	0.063 + 1%	100	70	70	100	95	100	99
Imep + Dash[7] + 28% N	0.063 + 1% + 1%	100	75	75	100	100	100	100
Imep + Sunit[8] + 28% N	0.063 + 1% + 1%	99	75	75	100	100	100	99
Pendimethalin & imep + Sunit[8] + 28% N	0.88 & 0.063 1% + 1%	99	75	75	100	100	100	98
Seth + Flfp-P + bentazon + COC + 28% N	0.125 + 0.016 + 1.0 + 1% + 4%	60	85	85	100	100	100	98
Fluazifop-P + COC	0.125 + 1%	0	0	0	0	0	0	0
Flfp-P + COC	0.188 + 1%	0	0	0	0	0	0	0
Flfp-P & fenoxaprop + COC	0.125 & 0.035 + 1%	0	0	0	0	0	0	0
Flfp-P & fenx + fomesafen + COC	0.125 & 0.035 + 0.25 + 1%	98	98	98	100	100	100	100
Flfp-P & fenx + fome + 2,4-DB[2] + COC	0.125 & 0.035 + 0.25 + 0.031 + 1%	99	98	98	100	100	100	95
Flfp-P & fenx + fome + 2,4-DB[2] + bentazon + 28% N[4]	0.125 & 0.035 + 0.125 + 0.031 + 0.5 + 4%	99	98	98	100	100	100	99
Flfp-P & fenx + fome + thif[4]	0.125 & 0.035 + 0.25 + 0.004	99	95	95	100	100	100	98
Flfp-P & fome + COC	0.25 & 0.188 + 1%	99	90	90	100	100	100	100
Imep + nico[4]	0.063 + 0.016	99	70	70	100	100	100	100
Imep + prim[4]	0.063 + 0.018	99	80	80	100	100	100	100
nicosulfuron + COC	0.031 + 1%	90	70	70	98	60	50	60
Check		0	0	0	0	0	0	0
Primisulfuron + COC	0.036 + 1%	99	50	50	100	100	100	95
Nicosulfuron + primisulfuron + COC	0.016 + 0.018 + 1%	99	73	73	100	100	100	90
Nicosulfuron + primisulfuron + COC	0.008 + 0.027 + 1%	99	75	75	100	100	100	90
Nicosulfuron + primisulfuron + COC	0.024 + 0.09 + 1%	99	70	70	100	100	100	80
Nicosulfuron + primisulfuron + COC	0.024 + 0.027 + 1%	100	80	80	100	100	100	100
Bromoxynil + nico[4]	0.25 + 0.024	99	98	98	100	100	100	100
Brox + nico[4]	0.25 + 0.031	100	98	98	100	100	100	100
Brox + nico 28% N	0.25 + 0.031 + 2%	100	95	95	100	100	100	100
Brox + atra + nicosulfuron[4]	0.25 + 0.5 + 0.031	100	100	100	100	100	100	100
DPX-79406 + 28% N[4]	0.024 + 4%	99	70	70	50	50	100	10
DPX-79406 + brox[4]	0.016 + 0.25	99	80	80	100	100	100	99

[1]Independent Professional Seedsmen Association.
[2]Dimethylamine salt.
[3]Water soluable crystals of dimethylamine salt.
[4]Plus X-77 nonionic surfactant from Valent used at 0.25% v/v.
[5]COC- crop oil concentrate with 83% paraffin base petroleum oil, 16% surfactant, and 1% inert
[6]Butoxyethyl ester.
[7]Adjuvant from BASF.
[8]1% methylated seed oil.

Evaluation of V-53482 combinations for stale seedbed soybeans. Knake, Ellery L., Keith D. Sheriff, Joe D. Walsh, Ronald W. Heisner, and Lyle E. Paul. The purpose of this study was to evaluate V-53482 used in combination with metribuzin, clethodim, alachlor, and imazethapyr for stale seedbed soybeans.

Location:	DeKalb SW900A	Soil type:	Drummer silty clay loam	Crop:	Soybean
Plot size:	10 X 40 ft.			Variety:	Pioneer 9202
Drainage:	fair	Slope:	0 to 1%	Seeding rate:	54.5 lb/A
Organic matter:	5 to 6%	Exp. design:	Randomized complete block	Planting date:	May 24, 1991
Soil pH:	5.9			Row spacing:	30 inch
		Replications:	3		

Tillage: Moldboard plow November 3, 1990; disk and harrow April 24, 1991; used field cultivator with leveling bar April 25; cultivated check plot June 14.

A tractor mounted compressed air sprayer was used traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was ten feet with nozzles spaced 20 inches apart and 20 inches above the soil surface for preemergence and 20 inches above the weeds for postemergence.

Date:	May 21, 1991	June 12
Time:	2:30pm	10:00am
Treatment:	PPI	Postemergence
Temperature (F)		
air:	82	76
soil under sod 4 inch:	62	70
Soil moisture:	moist	moist
Wind (mph):	14 SW	2 SE
Sky (% overcast):	60	10
Relative humidity(%):	48	69
Rainfall (inch)		
previous week:	1.81	0.47
following week:	4.08	0.08

Species present:

Giant foxtail		
leaf no.	3	5 to 7
height (inch)	2.5	5 to 8
Redroot pigweed		
leaf no.	5	2 to 3
height (inch)	0.5	4 to 6
Common lambsquarters		
leaf no.	5	17
height (inch)	0.5	2 to 4
Velvetleaf		
leaf no.	2	5
height (inch)	1	3
Pennsylvania smartweed		
leaf no.	3	3 to 5
height (inch)	1	3 to 4
Ivyleaf morningglory		
leaf no.	2	4
height (inch)	1.5	2.5

All herbicide treatments in this study gave excellent weed control. Perhaps preparing the seedbed early and then applying herbicides later, closer to the time of weed emergence, contributed to the high degree of success. (Dept. of Agronomy, University of Illinois, Urbana.)

Table 1. Evaluation of V-53482 combinations for stale seedbed (Knake, Sheriff, Walsh, Heisner, and Paul).

Treatment	Rate	Soybean 5/31	Soybean 6/10	Soybean 6/19	Soybean 7/19	Gift 5/31	Gift 6/10	Gift 6/19	Gift 7/19
		Injury				Control			
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Check		0	0	0	0	0	0	0	0
Paraquat + metribuzin + metolachlor + X-77	0.47 + 0.38 + 2.5	0	0	0	0	97	98	98	93
V-53482 + meto + COC	0.063 + 2.5	0	2	2	0	80	92	89	83
V-53482 + meto + COC	0.094 + 2.5	0	4	4	0	90	95	94	88
V-53482 + metr + meto + COC	0.063 + 0.38 + 2.5	0	2	2	0	93	99	99	95
V-53482 + metr + meto + COC	0.094 + 0.38 + 2.5	0	4	4	2	95	99	99	93
V-53482 + clethodim + meto + COC	0.063 + 0.1 + 2.5	0	2	2	0	98	100	100	94
V-53482 + clethodim + meto + COC	0.094 + 0.1 + 2.5	0	4	4	1	100	100	95	87
V-53482 + imazethapyr + meto + COC	0.063 + 0.032 + 2.5	0	2	2	0	98	99	97	96
V-53482 + meto + COC/ clethodim + COC	0.063 + 2.5/ 0.1	0	2	2	0	90	94	94	91
V-53482 + meto + COC/ clethodim + COC	0.094 + 2.5/ 0.1	0	4	4	0	90	96	96	93
V-53482 + imep + meto + COC	0.094 + 0.032 + 2.5	0	4	4	0	100	100	99	93
	LSD(0.05)	0	0	0	0	6	4	4	10

Table 2. Evaluation of V-53482 combinations for stale seedbed (Knake, Sheriff, Walsh, Heisner, and Paul).

Treatment	Rate	Rrpw 5/31	Rrpw 6/10	Rrpw 6/19	Rrpw 7/19	Colq 5/31	Colq 6/10	Colq 6/19	Colq 7/19
		Control							
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Check		0	0	0	0	0	0	0	0
Paraquat + metribuzin + metolachlor + X-77	0.47 + 0.38 + 2.5	100	100	99	99	100	100	100	100
V-53482 + meto + COC	0.063 + 2.5	100	100	99	99	100	100	100	100
V-53482 + meto + COC	0.094 + 2.5	100	100	100	100	100	100	99	99
V-53482 + metr + meto + COC	0.063 + 0.38 + 2.5	100	100	99	99	100	100	100	100
V-53482 + metr + meto + COC	0.094 + 0.38 + 2.5	100	100	100	100	100	100	100	100
V-53482 + clethodim + meto + COC	0.063 + 0.1 + 2.5	100	100	99	99	100	100	100	98
V-53482 + clethodim + meto + COC	0.094 + 0.1 + 2.5	100	100	100	98	100	100	99	98
V-53482 + imazethapyr + meto + COC	0.063 + 0.032 + 2.5	100	100	100	100	100	100	100	100
V-53482 + meto + COC/ clethodim + COC	0.063 + 2.5/ 0.1	100	100	100	99	100	100	100	100
V-53482 + meto + COC/ clethodim + COC	0.094 + 2.5/ 0.1	100	100	100	100	100	100	100	100
V-53482 + imep + meto + COC	0.094 + 0.032 + 2.5	100	100	100	100	100	100	100	100
	LSD(0.05)	0	0	0	1	0	0	0.4	1.7

Table 3. Evaluation of V-53482 combinations for stale seedbed (Knake, Sheriff, Walsh, Heisner, and Paul).

Treatment	Rate	Vele 5/31	Vele 6/10	Vele 6/19	Vele 7/19	Ilmg 5/31	Ilmg 6/10	Ilmg 6/19	Ilmg 7/19
		---------- Control ----------							
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Check		0	0	0	0	0	0	0	0
Paraquat + metribuzin + metolachlor + X-77	0.47 + 0.38 + 2.5	98	99	99	98	0	17	0	0
V-53482 + meto + COC	0.063 + 2.5	100	100	98	95	100	100	100	95
V-53482 + meto + COC	0.094 + 2.5	98	99	96	93	100	100	100	95
V-53482 + metr + meto + COC	0.063 + 0.38 + 2.5	100	99	99	95	100	100	100	97
V-53482 + metr + meto + COC	0.094 + 0.38 + 2.5	100	100	99	98	100	100	100	97
V-53482 + clethodim + meto + COC	0.063 + 0.1 + 2.5	100	99	98	93	10	100	100	100
V-53482 + clethodim + meto + COC	0.094 + 0.1 + 2.5	100	99	99	93	100	100	100	100
V-53482 + imazethapyr + meto + COC	0.063 + 0.032 + 2.5	100	100	99	95	100	100	99	99
V-53482 + meto + COC/ clethodim + COC	0.063 + 2.5/ 0.1	100	99	97	92	100	100	99	99
V-53482 + meto + COC/ clethodim + COC	0.094 + 2.5/ 0.1	100	99	99	93	100	99	99	99
V-53482 + imep + meto + COC	0.094 + 0.032 + 2.5	100	100	99	99	100	100	100	100
	LSD(0.05)	2	1	2	6	0	14	1	5

Table 4. Evaluation of V-53482 combinations for stale seedbed (Knake, Sheriff, Walsh, Heisner, and Paul).

Treatment	Rate	Tamg 6/10	Tamg 6/19	Tamg 7/19	Pesw 5/31	Soybean yield
		-------- Control --------				
	(lb/A)	(%)	(%)	(%)	(%)	(bu/A)
Check		0	0	0	0	22.7
Paraquat + metribuzin + metolachlor + X-77	0.47 + 0.38 + 2.5	17	0	0	100	44.5
V-53482 + meto + COC	0.063 + 2.5	99	99	87	100	37.0
V-53482 + meto + COC	0.094 + 2.5	99	99	95	100	44.5
V-53482 + metr + meto + COC	0.063 + 0.38 + 2.5	99	99	96	100	50.8
V-53482 + metr + meto + COC	0.094 + 0.38 + 2.5	100	99	96	100	44.5
V-53482 + clethodim + meto + COC	0.063 + 0.1 + 2.5	98	98	92	100	52.0
V-53482 + clethodim + meto + COC	0.094 + 0.1 + 2.5	99	96	85	100	42.9
V-53482 + imazethapyr + meto + COC	0.063 + 0.032 + 2.5	100	98	95	100	51.6
V-53482 + meto + COC/ clethodim + COC	0.063 + 2.5/ 0.1	100	99	99	100	51.6
V-53482 + meto + COC/ clethodim + COC	0.094 + 2.5/ 0.1	99	99	98	100	48.6
V-53482 + imep + meto + COC	0.094 + 0.032 + 2.5	100	100	100	100	54.3
	LSD(0.05)	14	2	8	0	11.1

X-77 @ 0.25% v/v: a nonionic surfactant from Valent.
COC @ 1.0 qt/A.: Crop oil concentrate, 83% paraffin base petroleum oil with 16% surfactant, and 1% inert.

Evaluation of V-53482 and metolalchlor for weed control under two soil moisture conditions. Knake, Ellery L., Keith D. Sheriff, Ronald W. Heisner, Lyle E. Paul, and Joe D. Walsh. The purpose of this study was to evaluate efficacy of V53482 soil-applied alone and with metolalchlor under two different soil conditions.

Location:	DeKalb SW900 B & G	Soil type:	Drummer silty clay loam	Crop:	Soybean
				Variety:	Williams 82
Plot size:	10 X 40 ft	Slope:	0 to 1%	Seeding rate:	54.5 lb/A
Drainage:	fair & poor	Exp. design:	Randomized complete block	Planting date:	April 26, 1991
Organic matter:	5 to 6%				
Soil pH:	5.9	Replications:	3	Row spacing:	30 inch

Tillage: Moldboard plowed November 3, 1990; disked and harrowed April 24 1991; used field cultivator with leveling bar April 25; check plots cultivated June 14.
A tractor mounted compressed air sprayer was used traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was ten feet with nozzles spaced 20 inches apart and 20 inches above the soil surface.

Date:	April 26, 1991				
Time:	3:30 to 4:00pm	Soil moisture:	moist	Rainfall (inch)	
Treatment:	Preemergence	Wind (mph):	14 SE	previous week:	4.08
Temperature (F)		Sky (% overcast):	5 to 10	following week:	0.57
air:	76	Relative humidity(%):	30		
soil under sod 4 inch:	54				

No species present

V-53482 gave excellent control of redroot pigweed, common lambsquarters, and Pennsylvania smartweed. Control of velvetleaf, ivyleaf morningglory, and tall morningglory was improved on soils with higher moisture. Metolachlor significantly improved control of giant foxtail but complete control was not achieved. (Department of Agronomy, University of Illinois, Urbana.)

Table 1. Evaluation of V-53482 and metolalchlor for weed control under two soil moisture conditions (fair drainage location) (Knake, Sheriff, Heisner, Paul, and Walsh).

Treatment	Rate	Soybean 5/15/91	Soybean 5/29	Soybean 6/10	Soybean 6/24	Gift 5/15	Gift 5/29	Gift 6/10	Gift 6/24
		Injury				Control			
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
V-53482	0.0625	0	10	1	0	13	47	20	10
V-53482 + metolachlor	0.0625 + 2.5	0	5	1	0	63	90	83	68
V-53482	0.094	0	10	2	0	7	52	40	20
V-53482 + meto	0.094 + 2.5	0	7	2	0	67	90	87	73
Check		0	0	0	0	0	0	0	0
	LSD(0.05)	0	2	0	0	8	5	5	13

Table 2. Evaluation of V-53482 and metolalchlor for weed control under two soil moisture conditions (fair drainage location) (Knake, Sheriff, Heisner, Paul, and Walsh).

Treatment	Rate	Rrpw 5/15	Rrpw 5/29	Rrpw 6/10	Rrpw 6/24	Colq 5/15	Colq 5/29	Colq 6/10	Colq 6/24
		Control							
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
V-53482	0.0625	93	100	100	100	100	100	100	100
V-53482 + metolachlor	0.0625 + 2.5	100	100	100	100	100	100	100	100
V-53482	0.094	100	100	100	100	100	100	100	100
V-53482 + meto	0.094 + 2.5	100	100	100	100	100	100	100	100
Check		0	0	0	0	0	0	0	0
	LSD(0.05)	5	0	0	0	0	0	0	0

Table 3. Evaluation of V-53482 and metolalchlor for weed control under two soil moisture conditions (fair drainage location) (Knake, Sheriff, Heisner, Paul, and Walsh).

Treatment	Rate	Vele 5/15	Vele 5/29	Vele 6/10	Vele 6/24	Pesw 5/15	Pesw 5/29	Pesw 6/10	Pesw 6/24
		Control							
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
V-53482	0.0625	10	77	60	53	3	83	100	93
V-53482 + metolachlor	0.0625 + 2.5	17	80	69	60	93	95	97	97
V-53482	0.094	23	82	84	82	83	100	100	93
V-53482 + meto	0.094 + 2.5	37	92	94	93	87	93	100	97
Check		0	0	0	0	0	0	0	0
	LSD(0.05)	13	8	14	7	6	8	5	6.7

Table 4. Evaluation of V-53482 and metolalchlor for weed control under two soil moisture conditions (fair drainage location) (Knake, Sheriff, Heisner, Paul, and Walsh).

Treatment	Rate	Ilmg 5/15	Ilmg 5/29	Ilmg 6/10	Ilmg 6/24	Tamg 6/10	Tamg 6/24	Soybean yield
		Control						
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(bu/A)
V-53482	0.0625	3	10	20	20	20	20	20.5
V-53482 + metolachlor	0.0625 + 2.5	13	10	20	20	20	20	33.4
V-53482	0.094	20	10	30	30	30	30	19.6
V-53482 + meto	0.094 + 2.5	20	10	33	33	33	33	33.0
Check		0	0	0	0	0	0	22.8
	LSD(0.05)	6	0	5	5	5	5	11.1

Table 5. Evaluation of V-53482 and metolalchlor for weed control under two soil moisture conditions (poor drainage location) (Knake, Sheriff, Heisner, Paul, and Walsh).

Treatment	Rate	Soybean 5/15/91	Soybean 5/29	Soybean 6/10	Soybean 6/24	Gift 5/15	Gift 5/29	Gift 6/10	Gift 6/24
		Injury				Control			
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
V-53482	0.0625	0	10	1	0	13	43	37	17
V-53482 + metolachlor	0.0625 + 2.5	0	10	1	0	70	90	85	75
V-53482	0.094	0	10	2	1	10	57	57	28
V-53482 + meto	0.094 + 2.5	0	7	2	1	67	90	90	83
Check		0	0	0	0	0	0	0	0
	LSD(0.05)	0	0	0	0	6	6	6	7

Table 6. Evaluation of V-53482 and metolalchlor for weed control under two soil moisture conditions (poor drainage location (Knake, Sheriff, Heisner, Paul, and Walsh).

Treatment	Rate	Rrpw 5/15	Rrpw 5/29	Rrpw 6/10	Rrpw 6/24	Colq 5/15	Colq 5/29	Colq 6/10	Colq 6/24
		Control							
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
V-53482	0.0625	97	100	100	100	100	100	100	100
V-53482 + metolachlor	0.0625 + 2.5	100	100	100	100	100	100	100	100
V-53482	0.094	100	100	100	100	100	100	100	100
V-53482 + meto	0.094 + 2.5	100	100	100	100	100	100	100	100
Check		0	0	0	0	0	0	0	0
	LSD(0.05)	5	0	0	0	0	0	0	0

Table 7. Evaluation of V-53482 and metolalchlor for weed control under two soil moisture conditions (poor drainage location) (Knake, Sheriff, Heisner, Paul, and Walsh).

Treatment	Rate	Vele 5/15	Vele 5/29	Vele 6/10	Vele 6/24	Pesw 5/15	Pesw 5/29	Pesw 6/10	Pesw 6/24
		Control							
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
V-53482	0.0625	7	72	85	82	3	75	96	85
V-53482 + metolachlor	0.0625 + 2.5	17	82	92	82	83	78	99	88
V-53482	0.094	23	87	99	99	80	87	99	92
V-53482 + meto	0.094 + 2.5	33	93	100	98	80	92	100	97
Check		0	0	0	0	0	0	0	0
	LSD(0.05)	16	6	5	8	10	8	2	3

Table 8. Evaluation of V-53482 and metolalchlor for weed ocntrol under two soil moisture conditions (poor drainage location) (Knake, Sheriff, Heisner, Paul, and Walsh).

Treatment	Rate	Ilmg 5/15	Ilmg 5/29	Ilmg 6/10	Ilmg 6/24	Tamg 6/10	Tamg 6/24	Soybean yield
		Injury						
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(bu/A)
V-53482	0.0625	3	7	30	30	30	30	11.3
V-53482 + metolachlor	0.0625 + 2.5	13	12	40	33	40	33	17.8
V-53482	0.094	10	10	50	33	50	33	12.4
V-53482 + meto	0.094 + 2.5	20	12	63	40	60	40	17.6
Check		0	0	0	0	0	0	10.6
	LSD(0.05)	6	6	0	7	0	7	6.0

Evaluation of soil-applied lactofen plus alachlor for weed control in soybeans. Knake, Ellery L., Howard E. Shepherd, Ronald W. Heisner, Joe D. Walsh, and Lyle E. Paul. The purpose of this study was to evaluate various rates of lactofen soil-applied with alachlor for weed control in soybeans.

Location:	DeKalb SW900C	Soil type:	Drummer silty clay loam	Crop:	Soybean
Plot size:	10 X 40 ft			Variety:	Williams 82
Drainage:	fair	Slope:	0 to 1%	Seeding rate:	54.5 lb/A
Organic matter:	5 to 6%	Exp. design:	Randomized complete block	Planting date:	April 26, 1991
Soil pH:	5.9	Replications: 3		Row spacing:	30 inch

Tillage: Moldboard plowed November 3, 1990; disked and harrowed April 24, 1991; used field cultivator with leveling bar April 25 1991; check plots cultivated June 14, 1991.
A tractor mounted compressed air sprayer was used traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was ten feet with nozzles spaced 20 inches apart and 20 inches above the soil surface.

Date:	April 26, 1991	Soil moisture:	moist	Rainfall (inch)	
Time:	3:30 to 4:00pm	Wind (mph):	14 SE	previous week:	4.08
Treatment:	Preemergence	Sky (% overcast):	5 to 10	following week:	0.57
Temperature (F)		Relative			
air:	76	humidity(%):	30		
soil under sod 4 inch:	54				

No species present

Results of this study indicated activity for soil-applied lactofen with a rate response. All herbicide treatments provided excellent control of redroot pigweed and fair to good control of common lambsquarters with some contribution likely from alachlor. Control of Pennsylvania smartweed was good to excellent with a rate response. Control of velvetleaf was only fair but with some improvement as lactofen rate was increased. Although there was some rate response for lactofen on ivyleaf and tall morningglories, good control was not achieved. Control of giant foxtail was fair to good with a slight contribution attributed to lactofen. (Dept. of Agronomy, University of Illinois, Urbana).

Table 1. Evaluation of soil-applied lactofen plus alachlor for weed control in soybean (Knake, Shepherd, Heisner, Walsh, and Paul).

Treatment	Rate	Soybean 5/15	Soybean 5/22	Soybean 5/29	Soybean 6/11	Gift 5/15	Gift 5/22	Gift 5/29	Gift 6/11
		Injury				Control			
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Lactofen + alachlor	0.2 + 3.0	0	0	4	1	77	83	88	80
Lact + alac	0.3 + 3.0	0	0	5	2	83	87	92	85
Lact + alac	0.4 + 3.0	0	0	5	3	80	88	90	90
Check		0	0	0	0	0	0	0	13
	LSD(0.05)	0	0	1	0	7	5	4	22

Table 2. Evaluation of soil-applied lactofen plus alachlor for weed control in soybean (Knake, Shepherd, Heisner, Walsh, and Paul).

Treatment	Rate	Rrpw 5/15	Rrpw 5/22	Rrpw 6/11	Colq 5/15	Colq 5/22	Colq 5/29	Colq 6/11
		Control						
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Lactofen + alachlor	0.2 + 3.0	100	100	100	100	100	100	83
Lact + alac	0.3 + 3.0	100	100	100	100	100	100	90
Lact + alac	0.4 + 3.0	100	100	100	100	100	100	97
Check		0	0	0	0	0	0	0
	LSD(0.05)	0	0	0	0	0	0	13

Table 3. Evaluation of soil-applied lactofen plus alachlor for weed control in soybean (Knake, Shepherd, Heisner, Walsh, and Paul).

Treatment	Rate	Vele 5/15	Vele 5/22	Vele 5/29	Vele 6/11	Ilmg 5/15	Ilmg 5/22	Ilmg 5/29	Ilmg 6/11
		Control							
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Lactofen + alachlor	0.2 + 3.0	53	40	50	60	7	10	7	10
Lact + alac	0.3 + 3.0	60	45	58	70	10	13	8	20
Lact + alac	0.4 + 3.0	62	50	60	80	10	27	10	30
Check		0	0	0	0	0	0	0	0
	LSD(0.05)	7	11	10	0	6	7	5	0

Table 4. Evaluation of woil-qpplied lactofen plus alachlor for weed control in soybean (Knake, Shepherd, Heisner, Walsh, and Paul).

Treatment	Rate	Pesw 5/15	Pesw 5/22	Pesw 5/29	Pesw 6/11	Tamg 6/11	Soybean yield
		Control					
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(bu/A)
Lactofen + alachlor	0.2 + 3.0	70	83	87	92	10	34.1
Lact + alac	0.3 + 3.0	77	87	93	97	20	32.9
Lact + alac	0.4 + 3.0	80	93	95	100	30	36.1
Check		0	0	0	0	0	23.9
	LSD(0.05)	11	7	7	3	0	5.5

Evaluation of lactofen soil-applied followed by sequential application of lactofen plus clethodim. Knake, Ellery L., Howard E. Shepherd, Ronald W. Heisner, Joe D. Walsh, and Lyle E. Paul. The purpose of this study was to evaluate soil-applied lactofen followed by postemergence application of lactofen plus clethodim.

Location:	DeKalb SW900D	Soil type:	Drummer silty clay loam	Crop:	Soybean
Plot size:	10 X 40 ft			Variety:	Williams 82
Drainage:	fair	Slope:	0 to 1%	Seeding rate:	54.5 lb/A
Organic matter:	5 to 6%	Exp. design:	Randomized complete block	Planting date:	April 26, 1991
Soil pH:	5.9				
		Replications:	3	Row spacing:	30 inch

Tillage: Moldboard plowed November 3, 1990; disked and harrowed April 24, 1991; used field cultivator with leveling bar April 25; check plots cultivated June 14.
A tractor mounted compressed air sprayer was used traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was ten feet with nozzles spaced 20 inches apart and 20 inches above the soil surface for preemergence and 20 inches above the weeds for postemergence.

Date:	April 26, 1991	May 22	Giant foxtail
Time:	3:30 to 4:00pm	2:30pm	leaf no. 2
Treatment:	Preemergence	Postemergence	height (inch) 2
Temperature (F)			Redroot pigweed
air:	76	82	leaf no. cotyl
soil under sod			height (inch) 1
4 inch:	54	64	Common lambsquarters
Soil moisture:	moist	moist	leaf no. 2
Wind (mph):	14 SE	13 SW	height (inch) 2
Sky (% overcast):	5 to 10	60	Velvetleaf
Relative			leaf no. 2
humidity(%):	30	60	height (inch) 1.5
Rainfall (inch)			Pennsylvania
previous week:	4.08	1.84	smartweed
following week:	0.57	3.93	leaf no. 1
No species present		Species present on May 22:	height (inch) 2
		Soybeans	Ivyleaf morningglory
		leaf no. unifoliate	leaf no. 2
		Height (inch) 4	height (inch) 2
			Barnyardgrass
			leaf no. 2
			height (inch) 2

Giant foxtail control with clethodim postemergence was excellent and superior to earlier applications of alachlor or metolachlor in other nearby studies. All herbicide treatments gave excellent control of redroot pigweed. Control of common lambsquarters and annual morningglories was poor to fair. Control of Pennsylvania smartweed was good and was best with the higher amount of lactofen applied postemergence. Velvetleaf control was very good and increased with the higher rates applied postemergence. In general, using the higher rates of lactofen postemergence rather than preemergence improved weed control and also caused more temporary effect on the soybeans. (Dept. of Agronomy, University of Illinois, Urbana).

Table 1. Evaluation of lactofen soil-applied followed by sequential application of lactofen plus clethodim (Knake, Shepherd, Heisner, Walsh, and Paul).

Treatment	Rate	Soybean 5/15	Soybean 5/22	Soybean 6/11	Gift 5/15	Gift 5/22	Gift 6/11
		Injury			Control		
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)
Lactofen + COC/ lact + clethodim + COC	0.2 +/ 0.2 + 0.094	0	0	15	0	0	99
Lact + COC/ lact + clet + COC	0.25 +/ 0.15 + 0.094	0	0	10	0	0	99
Lact + COC/ lact + clet + COC	0.3 +/ 0.1 + 0.094	0	0	5	5	5	99
Check		0	0	0	0	0	0
	LSD(0.05)	0	0	0	0	52	0

Table 2. Evaluation of lactofen soil-applied followed by sequential application of lactofen plus clethodim (Knake, Shepherd, Heisner, Walsh, and Paul).

Treatment	Rate	Colq 5/15	Colq 5/22	Colq 6/11	Vele 5/15	Vele 5/22	Vele 6/11
		Control					
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)
Lactofen + COC/ lact + clethodim + COC	0.2 +/ 0.2 + 0.094	100	100	40	0	7	98
Lact + COC/ lact + clet + COC	0.25 +/ 0.15 + 0.094	100	100	40	0	13.3	95
Lact + COC/ lact + clet + COC	0.3 +/ 0.1 + 0.094	100	100	33	3	23	90
Check		0	0	0	0	0	0
	LSD(0.05)	0	0	11	6	7	0

COC is crop oil concentrate used at 1 qt/A: 83% paraffin base petroleum oil with 16% surfactuant and 1% inert.

Table 3. Evaluation of lactofen soil-applied followed by sequential application of lactofen plus clethodim (Knake, Shepherd, Heisner, Walsh, and Paul).

Treatment	Rate	Ilmg 5/15	Ilmg 5/22	Ilmg 6/11	Pesw 5/15	Pesw 5/22	Pesw 6/11
		Control					
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)
Lactofen + COC/ lact + clethodim + COC	0.2 +/ 0.2 + 0.094	0	0	50	0	20	99
Lact + COC/ lact + clet + COC	0.25 +/ 0.15 + 0.094	0	0	60	0	20	99
Lact + COC/ lact + clet + COC	0.3 +/ 0.1 + 0.094	0	0	46	0	23	90
Check		0	0	0	0	0	0
	LSD(0.05)	0	0	5	0	5	0

Table 4. Evaluation of lactofen soil-applied followed by sequential application of lactofen plus clethodim (Knake, Shepherd, Heisner, Walsh, and Paul).

Treatment	Rate	Tamg 6/11	Rrpw 5/15	Rrpw 5/22	Soybean yield
		Control			
	(lb/A)	(%)	(%)	(%)	(bu/A)
Lactofen + COC/ lact + clethodim + COC	0.2 +/ 0.2 + 0.094	50	100	100	35.6
Lact + COC/ lact + clet + COC	0.25 +/ 0.15 + 0.094	60	100	100	35.5
Lact + COC/ lact + clet + COC	0.3 +/ 0.1 + 0.094	46	100	100	30.1
Check		0	0	0	18.3
	LSD(0.05)	5	0	0	7.6

COC is crop oil concentrate used at 1 qt/A: 83% paraffin base petroleum oil with 16% surfactant and 1% inert.

Evaluation of lactofen combinations for weed control in soybeans. Knake, Ellery L., Howard E. Shepard, Ronald W. Heisner, Joe D. Walsh, and Lyle E. Paul. The purpose of this study was to evaluate postemergence application of lactofen in combination with thifensulfuron, imazethapyr, bentazon, and chlorimuron.

Location:	DeKalb SW900E	Soil type:	Drummer silty clay loam	Crop:	Soybean
Plot size:	10 X 40 ft			Variety:	Williams 82
Drainage:	fair	Slope:	0 to 1%	Seeding rate:	54.5 lb/A
Organic matter:	5 to 6%	Exp. design:	Randomized complete block	Planting date:	April 26, 1991
Soil pH:	5.9				
		Replications:	3	Row spacing:	30 inch

Tillage: Moldboard plowed November 3, 1990; disked and harrowed April 24, 1991; used field cultivator with leveling bar April 25; check plots cultivated June 14.
A tractor mounted compressed air sprayer was used traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was ten feet with nozzles spaced 20 inches apart and 20 inches above the weeds.

Date:	May 22, 1991				
Time:	3:00pm	Species present:			
Treatment:	Postemergence	Soybean		Velvetleaf	
Temperature (F)		leaf no.	unifoliate	leaf no.	2
air:	82	height (inch)	4	height (inch)	2
soil under sod		Giant foxtail		Pennsylvania smartweed	
4 inch:	64	leaf no.	2	leaf no.	1
Soil moisture:	moist	height (inch)	2	height (inch)	2
Wind (mph):	13 SW	Redroot pigweed		Ivyleaf morningglory	
Sky (% overcast):	60	leaf no.	cotyledon	leaf no.	2
Relative		height (inch)	1	height (inch)	2
humidity(%):	60	Common lambsquarters		Barnyardgrass	
Rainfall (inch)		leaf no.	2	leaf no.	2
previous week:	1.84	height (inch)	2	height (inch)	2
following week:	3.93				

All herbicide treatments gave excellent control of redroot pigweed and Pennsylvania smartweed. Addition of thifensulfuron, imazethapyr, or bentazon to lactofen significantly improved control of common lambsquarters but chlorimuron gave little help. Lactofen plus bentazon or imazethapyr gave excellent control of velvetleaf with thifensulfuron a little less effective and chlorimuron least effective. All treatments gave only poor to fair control of the annual morningglories. In general, imazethapyr or bentazon performed best with lactofen and there was a slight rate response for lactofen. Imazethapyr had the advantage of providing control of grass weeds. Clethodim applied to the entire area on June 12 when giant foxtail was about 8 inches tall provided good control. (Dept. of Agronomy, University of Illinois, Urbana.)

Table 1. Evaluation of lactofen combinations for weed control in soybeans (Knake, Shepherd, Heisner, Walsh, and Paul).

Treatment	Rate	Soybean 5/29	Soybean 6/11	Gift 5/29	Gift 6/11	Rrpw 5/29	Rrpw 6/11	Pesw 5/29	Pesw 6/11
		-- Injury --		---------- Control ----------					
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Lactofen + thifensulfuron + X-77[1]	0.1 + 0.004	5	5	12	10	100	100	90	100
Lact + thif + X-77[1]	0.125 + 0.004	10	7	12	10	100	100	93	100
Lact + imazethapyr + X-77 + 28%N	0.1 + 0.063	7	10	82	80	100	100	95	100
Lact + imep + X-77 + 28%N	0.125 + 0.063	10	12	80	80	100	100	98	100
Lact + bent + X-77 + 28%N	0.1 + 0.5	5	5	13	10	100	100	100	100
Lact + bentazon + X-77 + 28%N	0.125 + 0.5	10	7	13	10	100	100	100	100
Lact + clim + X-77 + 28%N	0.1 + 0.008	5	5	17	10	100	100	98	100
Lact + chlorimuron + X-77 + 28%N	0.125 + 0.008	7	7	18	10	100	100	100	100
Check		0	0	0	0	0	0	0	0
LSD		2	0	5	0	0	0	4	0

Table 2. Evaluation of lactofen combinations for weed control in soybeans (Knake, Shepherd, Heisner, Walsh, and Paul).

Treatment	Rate	Colq 5/29	Colq 6/11	Vele 5/29	Vele 6/11	Ilmg 5/29	Ilmg 6/11	Tamg 6/11	Soybean yield
		---------- Control ----------							
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(bu/A)
Lactofen + thifensulfuron + X-77[1]	0.1 + 0.004	87	97	57	88	10	30	30	33.9
Lact + thif + X-77[1]	0.125 + 0.004	92	100	67	93	23	57	56	34.9
Lact + imazethapyr + X-77 + 28%N	0.1 + 0.063	92	95	98	99	87	67	66	40.9
Lact + imep + X-77 + 28%N	0.0125 + 0.063	92	93	97	100	80	77	76	41.9
Lact + bentazon + X-77 + 28%N	0.1 + 0.5	97	100	100	100	87	57	56	36.8
Lact + bent + X-77 + 28%N	0.125 + 0.5	97	100	100	99	90	70	70	39.5
Lact + chlorimuron + X-77 + 28%N	0.1 + 0.008	75	27	90	70	80	50	50	34.2
Lact + clim + X-77 + 28%N	0.125 + 0.008	73	38	83	77	80	60	60	36.5
Check		0	0	0	0	0	0	0	28.7
	LSD(0.05)	7	10	8	3	6	10	10	6.3

[1] X-77 is a nonionic surfactant from Valent used at 0.125% v/v for the first two trearments, and at 0.25% v/v for the other treatments.
28% N is urea ammonium nitrate fertilizer solution used at 1 gal/A.
All plots were treated with clethodim @ 0.094 lb/A a.i. on June 12.

Evaluation of clethodim postemergence combinations for weed control in soybeans.
Knake, Ellery L., Howard E. Shepard, Ronald W. Heisner, Joe D. Walsh, and Lyle E. Paul. The purpose of this study was to evaluate postemergence combinations of clethodim with bentazon, chlorimuron, and lactofen for efficacy and possible antagonism.

Location:	DeKalb SW900F	Soil type:	Drummer silty clay loam	Crop:	Soybean
Plot size:	10 X 40 ft			Variety:	Williams 82
Drainage:	fair	Slope:	0 to 1%	Seeding rate:	54.5 lb/A
Organic matter:	5 to 6%	Exp. design:	Randomized complete block	Planting date:	April 26, 1991
Soil pH:	5.9			Row spacing:	30 inch
		Replications:	3		

Tillage: Moldboard plowed November 3 1990; disked and harrowed April 24, 1991; used field cultivator with leveling bar April 25; check plots cultivated June 14.
A tractor mounted compressed air sprayer was used traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was ten feet with nozzles spaced 20 inches apart and 20 inches above the weeds.

		Species present:			
Date:	May 22, 1991	Soybean		Velvetleaf	
Time:	3:30pm	leaf no.	unifoliate	leaf no.	2
Treatment:	Postemergence	height (inch)	4	height (inch)	2
Temperature (F)		Giant foxtail		Pennsylvania smartweed	
air:	82	leaf no.	2	leaf no.	1
soil under sod 4 inch:	64	height (inch)	2	height (inch)	2
Soil moisture:	moist	Redroot pigweed		Ivyleaf morningglory	
Wind (mph):	13 SW	leaf no.	cotyledon	leaf no.	2
Sky (% overcast):	60	height (inch)	1	height (inch)	2
Relative humidity(%):	60	Common lambsquarters		Barnyardgrass	
		leaf no.	2	leaf no.	2
Rainfall (inch)		height (inch)	2	height (inch)	2
previous week:	1.84				
following week:	3.93				

Clethodim provided excellent control of giant foxtail with little or no antagonism from bentazon, chlorimuron or lactofen. Chlorimuron and lactofen provided excellent control of redroot pigweed but bentazon did not. Bentazon provided good control of common lambsquarters but chlorimuron and lactofen did not. Bentazon and lactofen provided better control of velvetleaf than chlorimuron. None of the treatments gave good control of annual morningglories but all gave very good control of Pennsylvania smartweed. One of the most significant observations was control of redroot pigweed by adding lactofen to bentazon. (Dept.of Agronomy, University of Illinois, Urbana.)

Table 1. Evaluation of clethodim postemergence combinations for weed control in soybeans (Knake, Shepherd, Heisner, Walsh, and Paul).

Treatment	Rate	Soybean 5/31	Soybean 6/12	Gift 5/31	Gift 6/12	Rrpw 5/31	Rrpw 6/12	Colq 5/31	Colq 6/12
		-- Injury		---------- Control ----------					
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Clethodim + bentazon + COC	0.094 + 0.075 + 1%	5	0	82	97	0	0	97	98
Clet + chlorimuron + COC	0.094 + 0.008 + 1%	5	5	80	100	100	100	8	10
Clet + lactofen + COC	0.094 + 0.2 + 0.5%	15	10	88	97	100	99	9	10
Clet + lact + bent + COC	0.094 + 0.125 + 0.5 + 0.5%	15	7	93	99	100	97	98	95
Check		0	0	0	0	0	0	0	0
	LSD(0.05)	0	0	3	5	0	1	8	0

Table 2. Evaluation of clethodim postemergence combinations for weed control in soybeans (Knake, Shepherd, Heisner, Walsh, and Paul.

Treatment	Rate	Vele 5/31	Vele 6/12	Ilmg 5/31	Ilmg 6/12	Pesw 5/31	Pesw 6/12	Tamg 6/12	Soybean yield
		---------- Control ----------							
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(bu/A)
Clethodim + bentazon + COC	0.094 + 0.075 + 1%	90	97	10	10	97	99	10	46.6
Clet + chlorimuron + COC	0.094 + 0.008 + 1%	70	20	10	63	100	100	63	45.1
Clet + lactofen + COC	0.094 + 0.2 + 0.5%	90	90	20	30	95	97	30	44.3
Clet + lact + bent + COC	0.094 + 0.125 + 0.5 + 0.5%	95	97	20	40	97	97	40	41.4
Check		0	0	0	0	0	0	0	30.2
	LSD(0.05)	0	3	0	10	6	5	10	10.1

COC is crop oil concentrate with 83% paraffin base petroleum oil, 16% surfactant, and 1% inert.

Effect of imazethapyr on the performance of postemergence herbicides used for control of grass weeds. Knake, Ellery L., Ronald W. Heisner, Joe D. Walsh, and Lyle E. Paul. The purpose of this study was to determine the possible antagonistic effect of imazethapyr on sethoxydim, fluazifop-P plus fenoxaprop, and quizalofop.

Location:	DeKalb SW900H	Soil type:	Drummer silty clay loam	Crop:	Soybean
Plot size:	5 X 40 ft			Variety:	Williams 82
Drainage:	fair	Slope:	0 to 1%	Seeding rate:	54.5 lb/A
Organic matter:	5 to 6%	Exp. design:	Randomized complete block	Planting date:	April 26, 1991
Soil pH:	5.9				
		Replications:	3	Row spacing:	30 inch

Tillage: Moldboard plowed November 3 1990; disked and harrowed April 24 1991; used field cultivator with leveling bar April 25; check plots cultivated June 14.
A bicycle mounted OSU compressed air sprayer was used traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was five feet with nozzles spaced 20 inches apart and 20 inches above the weeds.

Date:	May 23, 1991	Species present:			
Time:	6:45am	Soybean		Velvetleaf	
Treatment:	Postemergence	leaf no.	1st trif	leaf no.	2
Temperature (F)		height (inch)	4	height (inch)	2
air:	69	Giant foxtail		Pennsylvania smartweed	
soil under sod 4 inch:	64	leaf no.	2	leaf no.	2
		height (inch)	2.5	height (inch)	2
Soil moisture:	moist	Redroot pigweed		Ivyleaf morningglory	
Wind (mph):	9 SSW	leaf no.	2	leaf no.	cotyl
Sky (% overcast):	100	height (inch)	2	height (inch)	1
Relative humidity(%):	93	Common lambsquarters		Giant ragweed	
		leaf no.	10 to 12	leaf no.	3
Rainfall (inch)		height (inch)	3.5	height (inch)	6
previous week:	1.84				
following week:	3.91				

In a previous study an antagonistic effect was noted resulting in decreased grass control when imazethapyr was added to clethodim. In this study, the most antagonism to decrease control of giant foxtail was noted with imazethapyr added to sethoxydim. Fluazifop-P plus fenoxaprop was intermediate and the least was with quizalofop. (Dept. of Agronomy, University of Illinois, Urbana.)

Table. Effect of imazethapyr on the performance of postemergence herbicides used for control of grass weeds (Knake, Heisner, Walsh, and Paul).

Treatment	Rate	Soybean 6/6	Soybean 6/18	Gift 6/6	Gift 6/18	Vele 6/6	Vele 6/18	Pesw 6/6	Pesw 6/18	Soybean yield
		---------- Control ----------								
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(bu/A)
Imazethapyr	0.063	0	0	62	52	50	50	100	78	11.0
Sethoxydim	0.14	0	0	90	93	0	0	0	0	7.5
Imep + seth	0.063 + 0.14	0	0	64	57	50	50	100	78	9.0
Fluazifop & fenoxaprop	0.125 & 0.035	0	0	99	99	0	0	0	0	9.6
Imep + flfp & fenx	0.063 + 0.125 & 0.35	0	0	82	75	50	50	100	82	12.7
Quizalofop	0.044	0	0	99	99	0	0	0	0	9.6
Imep + qufp	0.063 + 0.044	0	0	92	92	50	53	100	80	13.1
Check		0	0	0	0	0	0	0	0	3.5
	LSD(0.05)	0	0	5	5	0	4	0	3	3.0

Crop oil concentrate of 83% paraffin base petroleum oil with 16% surfactant and 1% inert was used @ 1.0 qt/A with each treatment.

Evaluation of quizalofop for early preplant of no-till soybeans. Knake, Ellery L., Joe D. Walsh, Ronald W. Heisner, and Lyle E. Paul. The purpose of this study was to evaluate quizalofop alone and in combination with 2,4-D for control of vegetation prior to planting no-till soybeans. The D+ isomer of quizalofop was used and the butoxyethyl low volatile ester of 2,4-D.

Location:	DeKalb SW1700E	Soil type:	Flanagan silt loam	Replications:	3
Plot size:	10 X 45 ft			Crop:	Soybean
Drainage:	fair	Slope:	0 to 1%	Seeding rate:	54.5 lb/A
Organic matter:	5 to 6%	Exp. design:	Randomized complete block	Planting date:	May 29, 1991
Soil pH:	6.0			Row spacing:	30 inch

Tillage: stalks chopped April 24 1991.

A tractor mounted compressed air sprayer was used traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was ten feet with nozzles spaced 20 inches apart and 20 inches above the weeds.

Date:	May 22, 1991	May 30, 1991
Time:	11:30 am	11:00 am
Treatment:	Knockdown	Postemergence application
Temperature (F)		
air:	77	78
soil under sod 4 inch:	63	71
Soil moisture:	wet	moist
Wind (mph):	11 SW	8 SSW
Sky (% overcast):	80	5
Relative humidity(%):	81	62
Rainfall (inch)		
previous week:	1.81	3.93
following week:	3.95	1.23
Giant foxtail		Giant foxtail
leaf no.	2	leaf no. 5 + 3 tillers
height (inch)	2	height (inch) 7
Velvetleaf		Velvetleaf
leaf no.	2	leaf no. 5
height (inch)	2	height (inch) 2.5
Yellow nutsedge		Yellow nutsedge
leaf no.	2	leaf no. 4
height (inch)	2	height (inch) 3.5
Giant ragweed		Common lambsquarters
leaf no.	5	leaf no. multiple
height (inch)	6	height (inch) 6.5
Common lambsquarters		Redroot pigweed
leaf no.	17	leaf no. 17
height (inch)	4	height (inch) 5.5
Pennsylvania smartweed		Horseweed
leaf no.	3	leaf no. multiple
height (inch)	2	height (inch) 10
Horseweed		
leaf no.	8	
height (inch)	6	

Quizalofop at all rates provided excellent control of giant foxtail, equivalent to control with sethoxydim applied early preplant. Although chlorimuron plus thifensulfuron was applied postemergence to all but the check plots, 2,4-D butoxyethyl ester applied early preplant enhanced control of velvetleaf. (Dept. of Agronomy, University of Illinois, Urbana.)

Table 1. Evaluation of quizalofop for early preplant of no-till soybeans (Knake, Walsh, Heisner and Paul).

Treatment	Rate	Soybean 6/4	Soybean 6/12	Soybean 6/25	Gift 6/4	Gift 6/12	Gift 6/25	Vele 6/4	Vele 6/12	Vele 6/25
		------- Injury ---------			---------- Control ----------					
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Quizalofop + COC	0.016	0	0	0	83	100	95	50	85	50
Qufp + COC	0.022	0	0	0	85	100	95	57	85	57
Qufp + COC	0.031	0	0	0	90	100	96	60	85	57
Qufp + COC	0.044	0	0	0	100	100	96	63	83	57
Qufp + 2,4-D + COC	0.016 + 0.24	0	0	0	88	100	95	73	99	92
Qufp + 2,4-D + COC	0.022 + 0.24	0	0	0	78	100	95	73	98	88
Qufp + 2,4-D + COC	0.031 + 0.24	0	0	0	90	100	95	73	98	90
Qufp + 2,4-D + COC	0.044 + 0.24	0	0	0	100	100	97	80	99	92
Sethoxydim + COC	0.094	0	0	0	87	100	94	60	85	38
Seth + 2,4-D + COC	0.094 + 0.24	0	0	0	87	100	94	80	99	95
2,4-D	0.24	0	0	0	50	50	50	80	99	91
Check		0	0	0	0	0	0	0	0	0
	LSD(0.05)	0	0	0	14	0	1	8	2	4

Table 2. Evaluation of quizalofop for early preplant of no-till soybeans (Knake, Walsh, Heisner and Paul).

Treatment	Rate	Colq 6/12	Colq 6/25	Voco[2] 6/12	Voco 6/25	Yens 6/25	Soybean yield
		---------- Control ----------					
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(bu/A)
Quizalofop + COC	0.016	98	97	50	50	30	36.5
Qufp + COC	0.022	100	93	50	50	30	33.9
Qufp + COC	0.031	100	97	50	50	32	33.4
Qufp + COC	0.044	98	97	50	50	33	32.0
Qufp + 2,4-D + COC	0.016 + 0.24	100	100	50	50	30	42.2
Qufp + 2,4-D + COC	0.022 + 0.24	100	100	50	50	33	43.4
Qufp + 2,4-D + COC	0.031 + 0.24	100	100	50	50	62	41.7
Qufp + 2,4-D + COC	0.044 + 0.24	100	100	50	50	63	43.2
Sethoxydim + COC	0.094	100	97	50	50	73	32.4
Seth + 2,4-D + COC	0.094 + 0.24	100	100	50	50	70	45.5
2,4-D	0.24	100	100	0	0	30	42.0
Check		0	0	0	0	0	24.8
	LSD(0.05)	2	5	0	0	7	7.0

[1] 1/16 oz/A a.i. of chlorimuron and 1/16 oz/A a.i. of thifensulfuron were applied to all plots except the check on May 30.
[2] Volunteer corn.
COC @ 1.0 qt/A: crop oil concentrate with 83% paraffin base petroleum oil, 16% surfactant, and 1% inert.
The 2,4-D was a butoxyethyl ester.

Evaluation of clethodim with imazethapyr, lactofen, and chlorimuron plus metribuzin, preplant for no-till soybeans. Knake, Ellery L., Howard Shepherd, Joe D. Walsh, Ronald W. Heisner, and Lyle E. Paul. The purpose of this study was to evaluate clethodim in combination with chlorimuron plus metribuzin, imazethapyr, and lactofen for control of existing vegetation prior to planting no-till soybeans.

Location:	DeKalb SW1700C	Soil type:	Flanagan silt loam	Replications:	3
Plot size:	10 X 45 ft			Crop:	Soybean
Drainage:	fair	Slope:	0 to 1%	Seeding rate:	54.5 lb/A
Organic matter:	5 to 6%	Exp. design:	Randomized complete block	Planting date:	May 29, 1991
Soil pH:	6.0			Row spacing:	30 inch

Tillage: stalks chopped April 24, 1991

A tractor mounted compressed air sprayer was used traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was ten feet with nozzles spaced 20 inches apart and 20 inches above the soil surface.

Date:	May 22, 1991	Rainfall (inch)		Giant ragweed	
Time:	12:00 noon	previous week:	1.81	leaf no.	5
Treatment:	Preemergence	following week:	3.95	height (inch)	5
Temperature (F)		Giant foxtail		Common lambsquarters	
air:	77	leaf no.	3	leaf no.	10 to 12
soil under sod (4 inch):	63	height (inch)	4	height (inch)	4
		Velvetleaf		Common ragweed	
Soil moisture:	wet	leaf no.	2	leaf no.	6
Wind (mph):	11 SW	height (inch)	2	height (inch)	10
Sky (% overcast):	80	Yellow nutsedge		Horseweed	
Relative humidity(%):	81	leaf no.	2	leaf no.	10
		height (inch)	4	height (inch)	6

Clethodim gave excellent control of giant foxtail at both 0.125 and 0.15 lb/A with no antagonism noted by adding metribuzin and chlorimuron, imazethapyr or lactofen. All treatments gave very good control of velvetleaf. Metribuzin and chlorimuron or imazethapyr gave very good control of common lambsquarters but lactofen did not. This study suggests the feasibility of clethodim plus metribuzin and chlorimuron, imazethapyr or lactofen for early preplant for no-till soybeans. However the addition of a herbicide to improve common lambsquarters control with lactofen is suggested. (Dept. of Agronomy, University of Illinois, Urbana.)

Table 1. Evaluation of clethodim with imazethapyr, lactofen, and chlorimuron plus metribuzin, preplant for no-till soybeans (Knake, Shepherd, Walsh, Heisner, and Paul).

Treatment	Rate	Soybean 6/12	Soybean 6/26	Soybean 7/24	Gift 5/29	Gift 6/12	Gift 6/26	Gift 7/24	Yens 5/29	Yens 6/26	Yens 7/24
		------- Injury -------			---------- Control ----------						
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Clethodim + metribuzin & chlorimuron + COC	0.125 + 0.28 & 0.047	0	0	0	93	100	100	98	90	93	93
Clet + metr & clim + COC	0.15 + 0.28 & 0.047	0	0	0	92	100	98	95	93	97	97
Clet + imazethapyr + COC	0.125 + 0.063	0	0	0	67	100	100	98	60	93	93
Clet + imep + COC	0.15 + 0.063	0	0	0	80	98	98	97	100	100	100
Clet + lactofen + COC	0.125 + 0.4	0	0	0	100	100	100	98	83	88	87
Clet + lactofen + COC	0.15 + 0.4	0	0	0	100	100	100	98	85	100	90
Check		0	0	0	0	0	0	0	0	0	0
	LSD(0.05)	0	0	0	16	2	2	4	29	11	11

Table 2. Evaluation of clethodim with imazethapyr, lactofen, and chlorimuron plus metribuzin, preplant for no-till soybeans (Knake, Shepherd, Walsh, Heisner, and Paul).

Treatment	Rate	Vele 5/29	Vele 6/12	Vele 6/26	Vele 7/24	Colq 5/29	Colq 6/12	Colq 6/26	Colq 7/24	Soybean yield
		---------- Control ----------								
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(bu/A)
Clethodim + metribuzin & chlorimuron + COC	0.125 + 0.28 & 0.047	100	100	99	97	97	100	100	100	44.4
Clet + metr & clim + COC	0.15 + 0.28 & 0.047	100	100	97	95	100	100	100	100	41.7
Clet + imazethapyr + COC	0.125 + 0.063	60	97	93	88	20	96	93	88	39.4
Clet + imep + COC	0.15 + 0.063	90	99	99	97	85	97	94	89	39.4
Clet + lactofen + COC	0.125 + 0.4	90	95	91	83	70	30	30	30	36.5
Clet + lactofen + COC	0.15 + 0.4	100	98	97	88	95	30	30	30	37.6
Check		0	0	0	0	0	0	0	0	15.6
	LSD(0.05)	9	3	5	9	26	1	3	6	6.5

COC @ 1.0 qt/A: crop oil concentrate is 83% paraffin base petroleum oil with 16% surfactant, and 1% inert.

Evaluation of herbicide combinations for no-till soybeans. Knake, Ellery L., Keith Sheriff, Ronald W. Heisner, Joe D. Walsh, and Lyle E. Paul. The purpose of this study was to evaluate one time herbicide combinations for no-till soybeans.

Location:	DeKalb SW1700W	Soil type:	Flanagan silt loam	Replications:	3
Plot size:	10 X 45 ft			Crop:	Soybean
Drainage:	fair	Slope:	0 to 1%	Seeding rate:	54.5 lb/A
Organic matter:	5 to 6%	Exp. design:	Randomized complete block	Planting date:	May 29, 1991
Soil pH:	6.0			Row spacing:	30 inch

Tillage: stalks chopped april 24 1991.
A tractor mounted compressed air sprayer was used traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was ten feet with nozzles spaced 20 inches apart and 20 inches above the soil surface.

Date:	May 22, 1991	Rainfall (inch)		Giant ragweed	
Time:	12:15 pm	previous week:	1.81	leaf no.	5
Treatment:	Preemergence	following week:	3.95	height (inch)	5
Temperature (F)		Giant foxtail		Common lambsquarters	
air:	77	leaf no.	3	leaf no.	10 to 12
soil under sod (4 inch):	63	height (inch)	4	height (inch)	4
		Velvetleaf		Common ragweed	
Soil moisture:	wet	leaf no.	2	leaf no.	6
Wind (mph):	11 SW	height (inch)	2	height (inch)	10
Sky (% overcast):	80	Yellow nutsedge		Horseweed	
Relative humidity(%):	81	leaf no.	2	leaf no.	10
		height (inch)	4	height (inch)	6

All herbicide treatments gave excellent control of giant foxtail, velvetleaf, Pennsylvania smartweed, and common lambsquarters with no significant effect on soybeans. Clethodim, glyphosate or glufosinate gave good burndown of giant foxtail and metolachlor provided residual control. For control of velvetleaf, V-53482 and metribuzin were effective although burndown with only glyphosate also appeared to be adequate. Control of common lambsquarters was very good with all herbicide treatments. (Dept. of Agronomy, University of Illinois, Urbana.)

Table 1. Evaluation of herbicide combinations for no-till soybeans (Knake, Sheriff, Heisner, Walsh, and Paul).

Treatment	Rate	Soybean 6/12	Soybean 6/26	Soybean 7/24	Gift 5/29	Gift 6/12	Gift 6/26	Gift 7/24	Yens 5/29	Pesw 5/29
		--------	Injury	--------	----------		Control		----------	
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Check		0	0	0	0	0	0	0	0	0
Clethodim + COC + V53482 + metolalchlor	0.094 + 0.063 + 2.5	0	0	0	100	100	99	96	100	100
Clet + COC + V53482 + meto	0.094 + 0.094 + 2.5	0	0	0	100	100	99	98	100	100
V53482 + meto + glyphosate	0.063 + 2.5 + 1.0	0	0	0	100	100	100	99	100	100
V53482 + meto + glyt	0.094 + 2.5 + 1.0	0	0	0	100	100	99	97	100	100
Meto + glyt	2.5 + 1.0	0	0	0	98	100	99	96	80	100
Metribuzin + meto + glyt	0.38 + 2.5 + 1.0	0	0	0	90	100	99	98	100	100
V53482 + meto + glufosinate	0.063 + 2.5 + 0.75	0	0	0	100	100	99	96	100	100
V53482 + meto + glufosinate	0.094 + 2.5 + 0.75	0	0	0	100	100	99	96	100	100
	LSD(0.05)	0	0	0	2	0	2	5	20	0

Table 2. Evaluation of herbicide combinations for no-till soybeans (Knake, Sheriff, Heisner, Walsh, and Paul).

Treatment	Rate	Vele 5/29	Vele 6/12	Vele 6/26	Vele 7/24	Colq 5/29	Colq 6/12	Colq 6/26	Colq 7/24	Soybean yield
		----------		----------	Control		----------			
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(bu/A)
Check		0	0	0	0	0	0	0	0	23.1
Clethodim + COC + V53482 + metolalchlor	0.094 + 0.063 + 2.5	100	100	97	94	100	100	100	100	47.9
Clet + COC + V53482 + meto	0.094 + 0.094 + 2.5	100	100	98	96	100	100	100	100	51.3
V53482 + meto + glyphosate	0.063 + 2.5 + 1.0	100	100	99	98	100	100	100	100	51.3
V53482 + meto + glyt	0.094 + 2.5 + 1.0	100	100	99	97	100	100	100	100	52.3
Meto + glyt	2.5 + 1.0	97	93	93	90	100	100	100	100	51.4
Metribuzin + meto + glyt	0.38 + 2.5 + 1.0	100	100	100	98	100	100	100	100	42.0
V53482 + meto + glufosinate	0.063 + 2.5 + 0.75	100	100	99	98	100	100	100	100	49.4
V53482 + meto + glufosinate	0.094 + 2.5 + 0.75	100	100	97	96	100	100	100	100	49.6
	LSD(0.05)	3	3	3	4	0	0	0	0	11.4

COC @ 1.0 qt/A: crop oil concentrate is 83% paraffin base petroleum oil with 16% surfactant, and 1% inert.

Weed control for no-till corn in soybean stubble. Tomera, Craig A., Ellery L. Knake, Lyle E. Paul, Ronald W. Heisner, and David R. Pike. The purpose of this study was to evaluate herbicide treatments for no-till corn after soybeans.

Location:	DeKalb SW1900E	Soil type:	Drummer silty clay loam	Crop:	Corn
Plot size:	50 X 10			Variety:	DK 636
Drainage:	fair	Slope:	0 to 1%	Seeding rate:	28,300
Organic matter:	5 to 6%	Exp. design:	Randomized complete block	Planting date:	May 1, 1991
Soil pH:	6.3			Row spacing:	30 inch
		Replications:	4		

Fertility: 180 lb/A NH_4NO_3 May 8, 1991.
A tractor mounted compressed air sprayer was used traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was ten feet with nozzles spaced 20 inches apart and 20 inches above the soil surface for preemergence and 20 inches above the weeds for postemergence.

Date:	April 24, 1991	May 30, 1991
Time:	2:00 pm	1:30 pm
Treatment:	Burndown & Pre	Postemergence
Temperature (F)		
air:	72	84
soil under sod		
4 inches:	49	73
Soil moisture:	moist	moist
Wind (mph):	10 N	15 SSW
Sky (% overcast):	25	5
Relative humidity(%):	22	54
Rainfall (inch)		
previous week:	0.15	3.93
following week:	0.57	1.59
Corn		
leaf no.		6
height (inch)		12
Giant foxtail		
leaf no.		5
height (inch)		3 to 5
Velvetleaf		
leaf no.	2 cotyl	4
height (inch)	0.5	2.5
Redroot pigweed		
leaf no.		9
height (inch)		3 to 4

Where corn and soybeans are the predominant crops, one of the most convenient approaches for no-till is to plant corn in soybean stubble. Previous studies have indicated a high degree of success without increasing amount or cost of herbicides. Combinations of atrazine and cyanazine in 1:1 or 1:3 ratios have provided both early burndown and good residual. The availability of nicosulfuron now provides the opportunity for a postemergence follow-up treatment if needed. A modest rate of glyphosate for early burndown combined with an acetanilide and atrazine has also performed well.

In this study, use of dicamba, bromoxynil or bentazon each in combination with atrazine and followed by nicosulfuron provided excellent control of grass weeds. For early application, dicamba with atrazine appeared to have some advantage over bromoxynil or bentazon for greater residual control of broadleaf weeds. (Dept. of Agronomy, University of Illinois, Urbana.)

Table 1. Weed control for no-till corn in soybean stubble (Tomera, Knake, Heisner, Pike, and Paul).

Treatment	Rate	Corn 6/4	Corn 6/10	Corn 6/24	Gift 6/4	Gift 6/10	Gift 6/24	Colq 6/4
		----- injury -----			--------- control -------			
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Atrazine + cyanazine + COC + 28%N	2.0 + 2.0	0	5	2	83	100	99	100
Glyphosate + metolalchlor & atra	0.38 + 2.0 & 1.6	0	1	0	93	100	100	100
Glyt + ICIA 5676 + atra	0.38 + 2.0 + 1.5	0	0	0	93	100	98	100
Cyan & atra + COC/ nicosulfuron + X-77	3.0 & 1.0/ 0.031	0	3	1	98	100	100	100
Dicamba & atra + COC/ nicosulfuron + X-77	0.47 & 0.92 0.031	0	5	2	93	100	100	100
Bromoxynil + atra/ nicosulfuron + X-77	0.25 + 0.5/ 0.031	0	0	0	80	98	96	100
Bentazon & atra + COC/ nicosulfuron + X-77	0.75 & 0.75/ 0.031	0	0	0	63	100	94	100
Check		0	0	0	0	0	0	0
	LSD(0.05)	0	5	2	22	1	4	0

Table 2. Weed control for no-till corn in soybean stubble (Tomera, Knake, Heisner, Pike, and Paul).

Treatment	Rate	VELE 6/4	VELE 6/10	VELE 6/24	YENS 6/4	RRPW 6/10	RRPW 6/24	Corn yield
		---------- control ----------						
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(bu/A)
Atrazine + cyanazine + COC + 28%N	2.0 + 2.0	78	97	90	95	100	100	133.5
Glyphosate + metolalchlor & atra	0.38 + 2.0 & 1.6	60	95	89	93	100	100	120.5
Glyt + ICIA 5676 + atra	0.38 + 2.0 + 1.5	87	99	97	97	100	100	99.7
Cyan & atra + COC/ nicosulfuron + X-77	3.0 & 1.0/ 0.031	91	99	98	95	100	100	115.5
Dicamba & atra + COC/ nicosulfuron + X-77	0.47 & 0.92/ 0.031	83	98	92	85	100	100	103.7
Bromoxynil + atra/ nicosulfuron + X-77	0.25 + 0.5/ 0.031	60	90	79	90	100	100	125.2
Bentazon & atra + COC/ nicosulfuron + X-77	0.75 & 0.75/ 0.031	58	76	63	95	100	95	81.2
Check		0	0	0	0	0	0	43.0
	LSD	21	12	11	12	0	5	79.5

COC- crop oil concentrate with 83% paraffin base petroleum oil, 16% surfactant, and 1% inert used at 1 qt/A.
28%N is urea ammonium nitrate fertilizer solution used at 1.0 gal/A.
X-77 nonionic surfactant from Valent used at 0.25% v/v.

Weed control for no-till soybeans after corn. Tomera, Craig A., Ellery L. Knake, Lyle E. Paul, Ronald W. Heisner, and David R. Pike. The purpose of this study was to evaluate herbicide treatments for no-till soybeans after corn.

Location:	DeKalb SW1900W	Soil type:	Drummer silty clay loam	Crop:	Soybean
Plot size:	50 X 10 ft.			Variety:	Pioneer 9272
Drainage:	fair	Slope:	0 to 1%	Seeding rate:	54.5 lb/A
Organic matter:	5 to 6%	Exp. design:	Randomized complete block	Planting date:	May 24, 1991
Soil pH:	6.3			Row spacing:	30 inch
		Replications:	4		

A tractor mounted compressed air sprayer was used for the first application traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was ten feet with nozzles spaced 20 inches apart and 20 inches above the weeds. A bicycle mounted OSU compressed air sprayer was used for second and third sequential applications traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was five feet with nozzles spaced 20 inches apart and 20 inches above the weeds.

Date:	May 21, 1991	June 18, 1991	June 24, 1991
Time:	2:30pm	1:30pm	1:30pm
Treatment:	Burndown	Postemergence	Late postemergence
Temperature (F)			
air:	81	81	78
soil under sod 4 inch:	62	70	68
Soil moisture:	moist	dry	dry
Wind (mph):	13 SSW	3 WSW	5 ESE
Sky (% overcast):	70	5	5
Relative humidity(%):	52	39	39
Rainfall (inch)			
previous week:	1.71	0.5	0.23
following week:	4.08	0.23	1.6
Soybeans			
leaf no.		2nd trifoliolate	3rd trifoliolate
height (inch)		6.5	7.5
Giant foxtail			
leaf no.	3	4 & 1 tiller	5 & 3 tillers
height (inch)	3	7.5	10
Redroot pigweed			
leaf no.		6	7
height (inch)		2.5	3.5
Common lambsquarters			
leaf no.	17		
height (inch)	2		
Velvetleaf			
leaf no.	cotyl	6	7
height (inch)	1	3.5	5.5
Common ragweed			
leaf no.	3	12	
height (inch)	2	5.5	
Yellow nutsedge			
leaf no.	6	9	11
height (inch)	3	8.5	10.5

The metribuzin and chlorimuron combination has generally given excellent control of a broad spectrum of broadleaf weeds, including weeds such as prickly lettuce and horseweed that are often associated with no-till. If pressure from grass weeds is not very great, the metribuzin and chlorimuron combination may be adequate as indicated in this study. However, herbicides such as pendimethalin or metolachlor might be added initially to strengthen grass control. Or metribuzin and chlorimuron can be applied initially and followed by a postemergence application of a herbicide such as quizalofop for control of grass weeds. Observations indicate that the postemergence grass killer should not be applied too early but

after most of the grass for the season has emerged. Clethodim has been of special interest since it has provided some residual activity, especially with favorable soil moisture conditions.

With chlorimuron, significant precaution is needed to avoid applying a relatively high rate on soils with pH above 6.8 to avoid carryover effects on crops such as corn the next season. Related studies have included treatments to reduce the chlorimuron rate. Replacing at least part of the chlorimuron with a shorter residual sulfonylurea herbicide such as thifensulfuron may be one possibility or a combination of clomazone with a reduced rate of metribuzin and chlorimuron appears promising.

Another possibility for no-till soybeans is a sequential approach with a herbicide such as glyphosate or sulphosate for early burndown followed by a later postemergence treatment of fluazifop-P and fomesafen.

One of the earliest programs introduced was use of 2,4-D plus sethoxydim for early "burndown" followed by bentazon and acifluorfen and then sethoxydim.

All of the treatments described for this study performed relatively well except in an area of the field with excessive flooding. (Dept. of Agronomy, University of Illinois, Urbana.)

Table 1. Weed control for no-till soybeans after corn (Tomera, Knake, Paul, Heisner, and Pike).

Treatment	Rate	Soybean 6/4	Soybean 6/17	Soybean 7/3	Gift 6/4	Gift 6/17	Gift 7/3
		------- injury -------			---- control ----		
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)
Metribuzin & chlorimuron + COC	0.28 & 0.047	0	2	0	55	100	97
Metr & clim + pendimethalin + COC	0.28 & 0.047 + 1.0	0	2	0	80	100	96
Metr & clim + metolalchlor + COC	0.28 & 0.047 + 2.5	0	2	0	100	100	100
Metr & clim + clethodim + COC	0.28 & 0.047 + 0.094	0	2	0	100	100	100
Metr & clim + COC/ quizalofop+ COC	0.28 & 0.047 / 0.044	0	2	0	85	98	99
Sulphosate/ fluazifop-P & fomesafen + COC	0.38/ 0.25 & 0.188	0	0	1	100	100	100
2,4-D + sethoxydim + Dash/ bentazon & acifluorfen + 28% N/ seth + COC	0.5 + 0.0625 / 0.75 & 0.17/ 0.14	0	3	3	100	99	100
Check		0	0	0	0	0	0
	LSD	0	0	1	33	3	3

Table 2. Weed control for no-till soybeans after corn (Tomera, Knake, Paul, Heisner, and Pike).

Treatment	Rate	Rrpw 6/17	Rrpw 7/3	Vele 6/4	Vele 6/17	Vele 7/3	Yens 6/4	Soybean yield
		---------- control ----------						
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(bu/A)
Metribuzin & chlorimuron + COC	0.28 & 0.047	100	100	91	90	62	100	35.9
Metr & clim + pendimethalin + COC	0.28 & 0.047 + 1.0	100	100	93	90	74	100	34.0
Metr & clim + metolalchlor + COC	0.28 & 0.047 + 2.5	100	100	94	95	61	98	40.9
Metr & clim + clethodim + COC	0.28 & 0.047 + 0.094	99	93	89	91	75	100	34.7
Metr & clim + COC/ quizalofop+ COC	0.28 & 0.047 / 0.044	100	97	89	89	70	98	43.3
Sulphosate/ fluazifop-P & fomesafen + COC	0.38/ 0.25 & 0.188	100	96	83	62	56	65	44.7
2,4-D + sethoxydim + Dash/ bentazon & acifluorfen + 28% N/ seth + COC	0.5 + 0.0625 / 0.75 & 0.17/ 0.14	100	98	94	84	93	63	36.2
Check		0	0	0	0	0	0	30.7
	LSD	1	6	15	27	49	25	6.2

COC- crop oil concentrate with 83% paraffin base petroleum oil, 16% surfactant, and 1% inert used at 1 qt/A.
28% N is urea ammonium nitrate fertilizer solution used at 1.0 gal/A.
X-77 nonionic surfactant from Valent used at 0.25% v/v.
Dash @ 1 qt/A: an adjuvant from BASF.
The 2,4-D was a butoxyethyl ester formulation.

Evaluation of adjuvants for nicosulfuron. Mulrooney, Steven B., Ellery L.Knake, Kevin L. Hahn, Ronald W. Heisner, and Lyle E. Paul. The purpose of this study was to compare X-77 (a nonionic surfactant) crop oil concentrate, spray grade ammonium sulfate, and Scoil (a methylated seed oil) for use as adjuvants with nicosulfuron.

Location:	DeKalb S1100S	Soil type:	Flanagan silt loam	Crop:	Corn
Plot size:	5 X 50 ft			Variety:	Pioneer 3475
Drainage:	fair	Slope:	0 to 1%	Seeding rate:	28,300/A
Organic matter:	5%	Exp. design:	Randomized complete block	Planting date:	May 2, 1991
Soil pH:	5.9			Row spacing:	30 inch
		Replications:	3		

Fertility: 120 lb/A K_2O October 29, 1990; 180 lb/A NH_3NO_3
Tillage: Disked and harrowed April 26, 1991
A bicycle mounted OSU compressed air sprayer was used traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was five feet with nozzles spaced 20 inches apart and 20 inches above the giant foxtail.

Date:	May 30, 1991	Species present:			
Time:	7:30 am	Corn		Velvetleaf	
Treatment:	Postemergence	leaf no.	6	leaf no.	4
Temperature (F)		height (inch)	12	height (inch)	2.5
air:	71	Giant foxtail		Pennsylvania smartweed	
soil under sod 4 inches:	70	leaf no.	5	leaf no.	8
		height (inch)	3 to 5	height (inch)	3
Soil moisture:	moist	Redroot pigweed		Eastern black nightshade	
Wind (mph):	5 W	leaf no.	9	leaf no.	6
Sky (% overcast):	30	height (inch)	3 to 4	height (inch)	2
Relative humidity(%):	88	Common lambsquarters		Yellow nutsedge	
		leaf no.	19	leaf no.	6
Rainfall (inch)		height (inch)	2.5	height (inch)	4 to 5
previous week:	3.93				
following week:	1.23				

In general, ammonium sulfate and 28% urea ammonium nitrate solution each enhanced herbicide performance to about the same degree and appeared to be comparable. The methylated seed oil (Scoil) appeared to be most effective, with crop oil concentrate (an 83% parafin base petroleum oil) intermediate, and X-77 (a nonionic surfactant from Valent) slightly less effective for control of giant foxtail. For primisulfuron, the methylated seed oil appeared to be more effective than crop oil concentrate plus 28% UAN. For imazethapyr, X-77 plus 28% UAN and methylated seed oil were about equally effective for weed control but the methylated seed oil with imazethapyr appeared to have a little less effect on corn. (Dept. of Agronomy, University of Illinois, Urbana.)

Table. Evaluation of adjuvants for nicosulfuron (Mulrooney, Knake, Hahn, Heisner, and Paul).

Treatment	Rate	Corn 6/10 -injury-	Corn 6/19 -injury-	Corn 6/19 Height	Gift 6/10 control	Gift 6/19 control	Colq 6/10 control	Colq 6/19 control	Vele 6/10 control	Vele 6/19 control	Corn yield
	(lb/A)	(%)	(%)	(inch)	(%)	(%)	(%)	(%)	(%)	(%)	(bu/A)
Nicosulfuron + X-77	0.016	0	0	37	80	70	50	50	50	50	145.7
Nico + X-77 + AMS	0.016	1	1	35	85	75	70	60	70	63	156.1
Nico + X-77 + 28% N	0.016	1	1	37	85	75	70	60	70	60	170.9
Nico + Scoil	0.016	2	2	35	95	90	70	60	70	60	147.0
Nico + Scoil + AMS	0.016	2	2	35	99	98	80	70	80	70	152.1
Nico + Scoil + 28% N	0.016	3	3	34	100	99	80	70	80	70	166.9
Nico + COC	0.016	0	0	34	90	90	50	50	50	50	155.7
Nico + COC + AMS	0.016	1	1	35	95	95	70	60	70	63	156.3
Nico + COC + 28% N	0.016	1	1	37	95	95	70	60	70	60	147.7
Nico + X-77	0.031	0	0	36	90	90	70	70	70	70	151.1
Nico + X-77 + AMS	0.031	2	2	35	95	95	80	80	80	80	165.5
Nico + X-77 + 28% N	0.031	2	2	38	95	95	80	70	80	77	163.5
Nico + Scoil	0.031	2	2	38	98	98	70	70	70	60	163.0
Nico + Scoil + AMS	0.031	5	5	34	100	100	80	80	80	70	165.9
Nico + Scoil + 28% N	0.031	5	5	35	100	100	80	80	80	73	166.7
Nico + COC	0.031	0	0	37	95	95	70	60	70	60	128.1
Nico + COC + AMS	0.031	2	2	36	98	98	75	70	75	70	161.1
Nico + COC + 28% N	0.031	2	2	34	98	98	75	70	75	70	169.8
Prim + COC + 28% N	0.036	2	2	35	80	70	80	73	95	95	141.5
Prim + Scoil	0.036	5	5	35	90	70	90	77	95	95	143.2
Imep + X-77 + 28% N	0.063	50	50	20	95	95	85	82	95	95	73.2
Imep + Scoil	0.063	43	43	24	98	98	80	80	95	92	90.8
Check		0	0	32	0	0	0	0	0	0	113.0
	LSD(0.05)	2	2	4	1	0	3	4	0	4	26.3

COC- crop oil concentrate with 83% paraffin base petroleum oil, 16% surfactant, and 1% inert used at 1 qt/A.
28% N is urea ammonium nitrate fertilizer solution used at 1.0 gal/A.
X-77 nonionic surfactant from Valent used at 0.25% v/v.
AMS is ammonium sulfate used at 2 lb/A.
Scoil is methylated seed oil used at 1 qt/A.

Evaluation of nicosulfuron in combination with herbicides for broadleaf weed control in corn. Mulrooney, Steven B., Ellery L.Knake, Kevin L. Hahn, Ronald W. Heisner, and Lyle E. Paul. The purpose of this study was to evaluate the potential for antagonism and the effect on crop tolerance with nicosulfuron in combination with various herbicides for broadleaf weed control in corn.

Location:	DeKalb S1100N	Soil type:	Flanagan silt loam	Crop:	Corn
Plot size:	10 X 50 ft			Variety:	Pioneer 3475
Drainage:	fair	Slope:	0 to 1%	Seeding rate:	28,300/A
Organic matter:	5%	Exp. design:	Randomized complete block	Planting date:	May 2, 1991
Soil pH:	5.9			Row spacing:	30 inch
		Replications:	3		

Fertility: 120 lb/A K_2O October 29, 1990; 180 lb/A NH_3NO_3.
Tillage: Disked and harrowed April 26, 1991.
A tractor mounted compressed air sprayer was used traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was ten feet with nozzles spaced 20 inches apart and 20 inches above the giant foxtail (free standing).

		Species present:			
Date:	June 4, 1991	Corn		Velvetleaf	
Time:	7:30 am	leaf no.	8	leaf no.	5
Treatment:	Postemergence	height (inch)	16	height (inch)	5
Temperature (F)		Giant foxtail		Common ragweed	
air:	62	leaf no.	5	leaf no.	10
soil under sod 4 inch:	69	height (inch)	13 extnded	height (inch)	6
Soil moisture:	moist	Redroot pigweed		Yellow nutsedge	
Wind (mph):	16 E	leaf no.	9	leaf no.	9
Sky (% overcast):	5	height (inch)	5	height (inch)	12
Relative humidity(%):	51	Common lambsquarters			
		leaf no.	14		
Rainfall (inch)		height (inch)	5		
previous week:	1.24				
following week:	0.05				

There was little evidence of corn injury when 2,4-D, dicamba, atrazine, pyridate, bromoxynil, thifensulfuron or V-23031 were combined with nicosulfuron. However, combinations with cyanazine or bentazon had significant effect on corn. There appeared to be little conclusive evidence of antagonism and decreased control due to mixing other herbicides with nicosulfuron. Most combinations improved spectrum of weed control. Although control of giant foxtail with DPX-79406 was good, it appeared to be less effective than nicosulfuron on some broadleaf weeds. A combination of nicosulfuron and thifensulfuron showed promise for good weed control and good corn tolerance. (Dept. of Agronomy, University of Illinois, Urbana.)

Table 1. Evaluation of nicosulfuron in combination with herbicides for broadleaf weed control in corn (Mulrooney, Knake, Hahn, Heisner, and Paul).

Treatment	Rate	Corn 6/17	Corn 6/24	Corn 7/10	Corn 6/21	Corn 7/10	Gift 6/17	Gift 6/24	Gift 7/10
		---- injury ----			height	height	--- control ---		
	(lb/A)	(%)	(%)	(%)	(inch)	(inch)	(%)	(%)	(%)
Check		0	0	0	24	53	0	0	0
Nicosulfuron + X-77	0.047 + 0.25%	0	0	3	23	72	80	95	73
2,4-D amine + nicosulfuron + X-77	0.5 + 0.047 + 0.25%	0	0	0	26	73	80	93	80
2,4-D LV ester + nicosulfuron + X-77	0.25 + 0.047 + 0.25%	2	0	0	23	76	83	95	78
Dicamba + nicosulfuron + X-77	0.25 + 0.047 + 0.25%	2	2	0	23	70	87	93	78
Dica & atrazine + nicosulfuron + X-77	0.47 & 0.92 + 0.047 + 0.25%	3	2	2	24	72	87	95	77
Pyridate + nicosulfuron + X-77	0.45 + 0.047 + 0.25%	0	0	0	27	82	87	95	80
Pyridate + nicosulfuron + X-77	0.90 + 0.047 + 0.25%	0	0	0	24	81	87	95	85
Pyridate + atra + nicosulfuron + X-77	0.45 + 0.6 + 0.047 + 0.25%	0	0	0	24	74	85	95	85
Pyridate + atra + nicosulfuron + X-77	0.90 + 1.2 + 0.047 + 0.25%	0	0	0	26	78	90	95	83
Pydt + cyanazine + nicosulfuron + X-77	0.45 + 0.6 + 0.047 + 0.25%	40	35	15	19	68	92	92	60
Pydt + cyanazine + nicosulfuron + X-77	0.90 + 1.2 + 0.047 + 0.25%	60	53	27	16	67	93	93	60
Atrazine + nicosulfuron + X-77	2.0 + 0.047 + 0.25%	3	2	0	24	74	83	90	68
Cyanazine + nicosulfuron + X-77	2.0 + 0.047 + 0.25%	37	30	7	22	75	85	85	60
Bentazon + nicosulfuron + X-77	1.0 + 0.047 + 0.25%	37	32	23	20	74	90	95	82
Bent & atra + nicosulfuron + X-77	0.75 + 0.75 + 0.047 + 0.25%	30	30	17	19	75	90	92	83
Bromoxynil + atra + nicosulfuron + X-77	0.25 + 0.5 + 0.047 + 0.25%	2	2	5	29	77	90	90	85
DPX-M6316 + nicosulfuron + X-77	0.004 + 0.047 + 0.25%	0	0	0	26	78	98	98	93
V23031 + nicosulfuron + X-77	0.0625 + 0.047 + 0.25%	3	0	0	26	76	95	95	88
DPX-79406 + X-77	0.031 + 0.25%	5	2	0	25	75	93	93	90
DPX-79406 + COC	0.031 + 1 qt	3	3	7	24	74	95	95	90
	LSD (0.05)	9	9	6	6	13	5	3	10

X-77 is a nonionic surfactant from Valent.
DPX-79406 is a combination of nicosulfuron and DPX-E9636, 1:1 ratio.
COC is crop oil concentrate with 83% paraffin base petroleum oil with 16% surfactant and 1 inert.
The 2,4-D amine was a dimethylamine salt formulation.
The 2,4-D LV Ester was a butoxyethyl ester formulation.

Table 2. Evaluation of nicosulfuron in combination with herbicides for broadleaf weed control in corn (Mulrooney, Knake, Hahn, Heisner, and Paul).

Treatment	Rate	Rrpw 6/17	Rrpw 6/24	Rrpw 7/10	Colq 6/17	Colq 6/24	Colq 7/10	Vele 6/17	Vele 6/24	Vele 7/10
		---------- control ----------								
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Check		0	0	0	0	0	0	0	0	0
Nicosulfuron + X-77	0.047 + 0.25%	100	100	100	50	33	20	73	77	67
2,4-D amine + nicosulfuron + X-77	0.5 + 0.047 + 0.25%	98	97	97	92	92	92	90	90	90
2,4-D LV ester + nicosulfuron + X-77	0.25 + 0.047 + 0.25%	100	100	100	98	98	98	80	82	80
Dicamba + nicosulfuron + X-77	0.25 + 0.047 + 0.25%	98	98	98	98	98	95	87	87	83
Dica & atrazine + nicosulfuron + X-77	0.47 & 0.92 + 0.047 + 0.25%	100	100	100	100	100	100	98	98	96
Pyridate + nicosulfuron + X-77	0.45 + 0.047 + 0.25%	100	100	100	80	80	60	80	80	63
Pyridate + nicosulfuron + X-77	0.90 + 0.047 + 0.25%	100	100	100	87	87	70	90	90	87
Pyridate + atra + nicosulfuron + X-77	0.45 + 0.6 + 0.047 + 0.25%	100	100	100	100	100	87	95	95	87
Pyridate + atra + nicosulfuron + X-77	0.90 + 1.2 + 0.047 + 0.25%	100	100	100	100	100	100	100	98	95
Pydt + cyanazine + nicosulfuron + X-77	0.45 + 0.6 + 0.047 + 0.25%	100	100	98	100	100	100	100	100	98
Pydt + cyanazine + nicosulfuron + X-77	0.90 + 1.2 + 0.047 + 0.25%	100	100	100	100	100	100	98	97	92
Atrazine + nicosulfuron + X-77	2.0 + 0.047 + 0.25%	97	97	97	100	100	100	100	100	95
Cyanazine + nicosulfuron + X-77	2.0 + 0.047 + 0.25%	90	90	90	100	97	93	100	100	95
Bentazon + nicosulfuron + X-77	1.0 + 0.047 + 0.25%	90	90	90	80	77	60	100	97	92
Bent & atra + nicosulfuron + X-77	0.75 + 0.75 + 0.047 + 0.25%	97	97	97	100	93	85	100	90	90
Bromoxynil + atra + nicosulfuron + X-77	0.25 + 0.5 + 0.047 + 0.25%	95	95	95	100	100	100	100	98	97
DPX-M6316 + nicosulfuron + X-77	0.004 + 0.047 + 0.25%	95	95	95	92	88	78	90	88	90
V23031 + nicosulfuron + X-77	0.0625 + 0.047 + 0.25%	98	98	98	87	83	62	95	95	92
DPX-79406 + X-77	0.031 + 0.25%	100	100	100	17	17	10	33	33	33
DPX-79406 + COC	0.031 + 1 qt	100	100	93	10	10	10	27	27	27
	LSD (0.05)	3	3	5	14	7	10	6	7	8

X-77 is a nonionic surfactuant from Valent.
DPX-79406 is a combination of nicosulfuron and DPX-E9636, 1:1 ratio.
COC is crop oil concentrate with 83% paraffin base petroleum oil with 16% surfactant and 1% inert.
The 2,4-D amine was a dimethylamine salt formulation.
The 2,4-D LV Ester was a butoxyethyl ester formulation.

Table 3. Evaluation of nicosulfuron in combination with herbicides for broadleaf weed control in corn (Mulrooney, Knake, Hahn, Heisner, and Paul).

Treatment	Rate	Corw 6/17	Corw 6/24	Corw 7/10	Yens 6/17	Yens 6/24	Yens 7/10	Corn yield
		---------- control ----------						
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(bu/A)
Check		0	0	0	0	0	0	50.1
Nicosulfuron + X-77	0.047 + 0.25%	50	13	23	70	90	63	121.6
2,4-D amine + nicosulfuron + X-77	0.5 + 0.047 + 0.25%	97	98	97	70	82	62	137.7
2,4-D LV ester + nicosulfuron + X-77	0.25 + 0.047 + 0.25%	77	77	77	70	85	63	146.3
Dicamba + nicosulfuron + X-77	0.25 + 0.047 + 0.25%	100	100	100	70	78	60	138.8
Dica & atrazine + nicosulfuron + X-77	0.47 & 0.92 + 0.047 + 0.25%	100	100	100	80	77	67	140.1
Pyridate + nicosulfuron + X-77	0.45 + 0.047 + 0.25%	0	0	0	80	87	70	166.3
Pyridate + nicosulfuron + X-77	0.90 + 0.047 + 0.25%	0	0	0	85	83	82	156.6
Pyridate + atra + nicosulfuron + X-77	0.45 + 0.6 + 0.047 + 0.25%	100	100	100	85	80	60	152.3
Pyridate + atra + nicosulfuron + X-77	0.90 + 1.2 + 0.047 + 0.25%	100	100	100	85	77	60	163.0
Pydt + cyanazine + nicosulfuron + X-77	0.45 + 0.6 + 0.047 + 0.25%	100	100	100	85	70	58	107.6
Pydt + cyanazine + nicosulfuron + X-77	0.90 + 1.2 + 0.047 + 0.25%	100	100	100	85	70	63	110.3
Atrazine + nicosulfuron + X-77	2.0 + 0.047 + 0.25%	100	100	100	80	73	63	145.6
Cyanazine + nicosulfuron + X-77	2.0 + 0.047 + 0.25%	100	100	100	70	70	57	126.8
Bentazon + nicosulfuron + X-77	1.0 + 0.047 + 0.25%	100	100	100	85	85	60	101.4
Bent & atra + nicosulfuron + X-77	0.75 + 0.75 + 0.047 + 0.25%	100	100	100	82	80	60	120.4
Bromoxynil + atra + nicosulfuron + X-77	0.25 + 0.5 + 0.047 + 0.25%	100	100	100	70	70	53	147.3
DPX-M6316 + nicosulfuron + X-77	0.004 + 0.047 + 0.25%	100	100	100	70	80	67	160.4
V23031 + nicosulfuron + X-77	0.0625 + 0.047 + 0.25%	100	100	100	80	80	77	165.3
DPX-79406 + X-77	0.031 + 0.25%	100	97	100	57	65	53	139.3
DPX-79406 + COC	0.031 + 1 qt	100	100	100	57	60	57	145.3
	LSD(0.05)	15	16	17	6	9	9	36.0

X-77 is a nonionic surfactant from Valent.
DPX-79406 is a combination of nicosulfuron and DPX-E9636, 1:1 ratio.
COC is crop oil concentrate with 83% paraffin base petroleum oil with 16% surfactant and 1% inert.
The 2,4-D amine was a dimethylamine salt formulation.
The 2,4-D LV Ester was a butoxyethyl ester formulation.

Effect of time of day for application of sethoxydim. Knake, Ellery L., Joe D. Walsh, Ronald W. Heisner, and Lyle E. Paul. The purpose of this study was to compare applications of sethoxydim made at 6 am, noon, 6 pm, and midnight.

Location:	DeKalb S1400NC	Soil type:	Drummer silty clay loam	Crop:	Soybeans
Plot size:	5 X 45 ft			Variety:	Williams 82
Drainage:	fair	Slope:	0 to 1%	Seeding rate:	54.5 lb/A
Organic matter:	5 to 6%	Exp. design:	Randomized complete block	Planting date:	April 26, 1991
Soil pH:	6.3	Replications:	3	Row spacing:	30 inch

Fertility: 120 lb/A K_2O October 29, 1990.
Tillage: Disked and harrowed April 25, 1991.
A bicycle mounted OSU comressed air sprayer was used traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was five feet with nozzles spaced 20 inches apart and 20 inches above the giant foxtail.

Date:	May 23, 1991	May 23	May 23	May 23
Time:	6:00 am	noon	6:00 pm	midnight
Treatment:	Postemergence	Postemergence	Postemergence	Postemergence
Temperature (F)				
air:	69	75	74	72
soil under sod 4 inch:	62	63	69	68
Soil moisture:	moist	moist	moist	moist
Wind (mph):	9 SSW	12 S	17 SSW	6 S
Sky (% overcast):	100	80	60	dark
Relative humidity(%):	93	85	46	93
Rainfall (inch)				
previous week:	0.82			
following week:	4.42			
Species present:				
Soybeans		Common lambsquarters		Pennsylvania smartweed
leaf no.	1st trif	leaf no.	2	leaf no. 3
height (inch)	4	height (inch)	2	height (inch) 3
Giant foxtail		Velvetleaf		
leaf no.	3	leaf no.	2	
height (inch)	3	height (inch)	2	

Bentazon at 1 lb/A plus 1 qt/A crop oil concentrate was applied to the entire plot area at 9:00 am May 24, for control of broadleaf weeds using a tractor mounted compressed air sprayer traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Spray width was 10 feet with nozzles spaced 20 inches apart and 20 inches above the weeds. Excellent control of all broadleaf weeds was achieved.

If photodegradation is important for sethoxydim, then theoretically applications near dusk or after dark may allow more opportunity for uptake by plants and perhaps improved control and the opportunity to use lower rates. A study the previous year tended to support this theory and the study was repeated in 1991. However, the very favorable conditions in 1991 with relatively high temperatures, high humidity, good moisture conditions and very active plant growth appeared to preclude much difference for rate or time of day for application. Sethoxydim gave excellent control of giant foxtail regardless of rate or time of day. Any differences were very minor and difficult to elucidate. (Dept. of Agronomy, University of Illinois, Urbana.)

Table. Effect of time of day for application of sethoxydim (Knake, Walsh, Heisner, and Paul).

Treatment	Time	Rate (lb/A)	Gift 6/7	Soybean yield
			(% control)	(bu/A)
Sethoxydim + COC	6 am	0.094 + 1 qt/A	96	54.3
Seth + COC	6 am	0.188 + 1 qt/A	99	45.6
Seth + COC	noon	0.094 + 1 qt/A	97	48.9
Seth + COC	noon	0.188 + 1 qt/A	99	48.8
Seth + COC	6 pm	0.094 + 1 qt/A	98	54.1
Seth + COC	6 pm	0.188 + 1 qt/A	99	50.2
Seth + COC	midnight	0.094 + 1 qt/A	99	47.6
Seth + COC	midnight	0.188 + 1 qt/A	99	48.2
Check			0	27.1
LSD(0.05)			0.7	7.9

COC - crop oil concentrate with 83% paraffin base petroleum oil, 16% surfactant, and 1% inert.

Evaluation of sulfonylurea tolerant soybeans with chlorimuron, thifensulfuron, and imazethapyr. Knake, Ellery L., Ronald W. Heisner, Kevin L. Hahn, and Lyle E. Paul. The purpose of this study was to compare the degree of tolerance of Williams 82 STS soybeans with that of regular Williams 82 soybeans using various rates and combinations of chlorimuron and thifensulfuron.

Location:	DeKalb S1400NE	Soil type:	Drummer silty clay loam	Crop:	Soybean
Plot size:	10 X 45 ft			Variety:	Williams 82 & Williams 82 STS
Drainage:	fair	Slope:	0 to 1%		
Organic matter:	5 to 6%	Exp. design:	Randomized complete block	Seeding rate:	54.5 lb/A
Soil pH:	6.3			Planting date:	April 26, 1991
		Replications:	3	Row spacing:	30 inch

Fertility: 120 lb/A K_2O October 29, 1990.
Tillage: Disked and harrowed April 25, 1991.
A tractor mounted compressed air sprayer was used traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was ten feet with nozzles spaced 20 inches apart and 20 inches above the soybeans.

		Species present			
Date:	May 23, 1991	Soybean		Redroot pigweed	
Time:	8:00am	leaf no.	1st trif	leaf no.	2
Treatment:	Postemergence	height (inch)	6	height (inch)	1
Temperature (F)		Giant foxtail		Jimsonweed	
air:	70	leaf no.	2	leaf no.	2
soil under sod 4 inch:	64	height (inch)	4	height (inch)	2
Soil moisture:	moist	Yellow nutsedge		Common lambsquarters	
Wind (mph):	11 S	leaf no.	4	leaf no.	17
Sky (% overcast):	90	height (inch)	4	height (inch)	3
Relative humidity(%):	93	Velvetleaf		Eastern black nightshade	
Rainfall (inch)		leaf no.	2	leaf no.	2
previous week:	1.84	height (inch)	4	height (inch)	1.5
following week:	3.93				

The entire plot was treated with quizalofop (0.044 lb/A a.i.) plus crop oil concentrate (1 qt/A) on May 24 using the same sprayer and setting as indicated for May 23.

Although some rates of chlorimuron and thifensulfuron were considered relatively high, effect on soybeans was quite limited. Very little discoloration of soybeans was noted but slight differences in height and in canopy width were noted, with the sulfonylurea tolerant soybeans expressing more tolerance. Unexpectedly, imazethapyr appeared to have greater effect on the sulfonylurea tolerant soybeans than on the others. This suggests some caution in selecting herbicides for use on sulfonylurea tolerant soybeans.

Although the main objective was to compare soybean tolerance, observations on weed control indicated that the quizalofop applied to all plots gave excellent control of giant foxtail but was slightly less effective on yellow foxtail than on giant foxtail. Chlorimuron and imazethapyr were more effective on yellow nutsedge than thifensulfuron. All three herbicides gave excellent control of redroot pigweed and Pennsylvania smartweed. Thifensulfuron and imazethapyr were much more effective on common lambsquarters than chlorimuron. Only imazethapyr controlled eastern black nightshade. Although control of velvetleaf was generally not complete with any of the treatments, control did not fall below 90% for the June ratings. (Dept. of Agronomy, University of Illinois, Urbana.)

Table 1. Evaluation of sulfonylurea tolerant soybeans with chlorimuron, thifensulfuron, and imazethapyr (Knake, Heisner, Hahn, and Paul).

Treatment	Rate	Soybean non-STS 5/31 injury	Soybean STS 5/31 injury	Soybean non-STS 6/6 injury	Soybean STS 6/6 injury	Soybean non-STS 6/18 injury	Soybean STS 6/18 injury	Soybean non-STS 6/6 height	Soybean STS 6/6 height
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(inch)	(inch)
Thifensulfuron	0.004	4	0	3	0	1	0	10	10
Thif	0.008	5	0	5	0	2	0	10	10
Thif + chlorimuron	0.004 + 0.004	4	0	4	0	2	0	10	10
Thif + clim	0.004 + 0.0052	3	0	2	0	3	0	10	9
Thif + clim	0.004 + 0.008	5	0	5	0	5	0	9	9
Thif + clim	0.004 + 0.010	7	0	6	0	6	0	9	10
Thif + clim	0.004 + 0.012	7	0	8	0	7	0	9	9
Thif + clim	0.008 + 0.008	7	0	12	0	7	0	9	9
Clim	0.008	3	0	0	0	2	0	10	10
Clim	0.012	3	0	0	0	5	0	10	10
Imazethapyr + Dash + 28% N	0.063 + 1% + 1%	2	2	0	3	0	8	10	8
Check		0	0	0	0	0	0	10	9
	LSD(0.05)	3	1	4	1	0	0	1	1

Table 2. Evaluation of sulfonylurea tolerant soybeans with chlorimuron, thifensulfuron, and imazethapyr (Knake, Heisner, Hahn, and Paul).

Treatment	Rate	Soybean non-STS 6/7 width	Soybean STS 6/7 width	Soybean non-STS 6/18 height	Soybean STS 6/18 height	Soybean non-STS 6/18 width	Soybean STS 6/18 width
	(lb/A)	(inch)	(inch)	(inch)	(inch)	(inch)	(inch)
Thifensulfuron	0.004	9	11	17	16	18	20
Thif	0.008	9	10	17	17	19	20
Thif + chlorimuron	0.004 + 0.004	8	11	17	16	18	19
Thif + clim	0.004 + 0.0052	9	10	17	17	19	20
Thif + clim	0.004 + 0.008	8	9	16	16	16	18
Thif + clim	0.004 + 0.010	8	10	17	16	18	20
Thif + clim	0.004 + 0.012	9	10	17	17	18	20
Thif + clim	0.008 + 0.008	8	10	17	17	18	20
Clim	0.008	9	9	17	17	18	19
Clim	0.012	10	10	18	17	19	21
Imazethapyr + Dash + 28% N	0.063 + 1% + 1%	9	8	17	16	19	18
Check		11	10	17	16	19	18
	LSD(0.05)	2	2	1	1	2	3

COC- crop oil concentrate with 83% paraffin base petroleum oil, 16% surfactant, and 1% inert used at 1% on all treatments except the imazethapyr treatment and the untreated check.
28% N is urea ammonium nitrate fertilizer solution.
Dash is an adjuvant from BASF.
Entire area was treated with quizalofop @ 0.044 a.i. lb/A and 1 qt/A of COC ½ hour after primary treatments were applied.
Width refers to width of canopy of soybean rows.

Table 3. Evaluation of sulfonylurea tolerant soybeans with chlorimuron, thifensulfuron, and imazethapyr (Knake, Heisner, Hahn, and Paul).

Treatment	Rate	Gift 5/31	Gift 6/7	Gift 6/18	Yeft 5/31	Rrpw 5/31	Rrpw 6/7	Rrpw 6/18	Colq 5/31	Colq 6/7	Colq 6/18
		control									
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Thifensulfuron	0.004	82	100	100	82	100	100	100	100	100	98
Thif	0.008	90	100	100	90	100	100	100	97	100	100
Thif + chlorimuron	0.004 + 0.004	90	100	100	90	100	100	100	90	100	99
Thif + clim	0.004 + 0.0052	87	100	100	87	100	100	100	97	100	99
Thif + clim	0.004 + 0.008	80	100	100	80	100	100	100	97	100	98
Thif + clim	0.004 + 0.010	87	100	100	87	100	100	100	93	100	99
Thif + clim	0.004 + 0.012	93	100	100	93	100	100	100	92	100	100
Thif + clim	0.008 + 0.008	88	100	100	90	97	100	100	93	100	100
Clim	0.008	87	100	100	87	97	100	100	83	0	10
Clim	0.012	90	100	100	90	97	100	100	87	10	20
Imazethapyr + Dash + 28% N	0.063 + 1% + 1%	98	100	100	98	97	100	100	93	100	98
Check		0	0	0	0	0	0	0	0	0	0
	LSD(0.05)	7	0	0	7	5	0	0	11	0	2

Treatment	Rate	Vele 5/31	Vele 6/7	Vele 6/18	Pesw 5/31	Pesw 6/7	Pesw 6/18	Ebns 5/31	Ebns 6/7	Ebns 6/18
		control								
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Thifensulfuron	0.004	73	92	92	85	100	99	0	0	0
Thif	0.008	72	94	92	93	100	100	0	0	0
Thif + chlorimuron	0.004 + 0.004	78	94	94	100	100	100	0	0	0
Thif + clim	0.004 + 0.0052	82	95	95	98	100	100	0	0	0
Thif + clim	0.004 + 0.008	85	97	97	93	100	100	0	0	0
Thif + clim	0.004 + 0.010	82	99	99	90	100	100	0	0	0
Thif + clim	0.004 + 0.012	83	98	98	92	100	100	0	0	0
Thif + clim	0.008 + 0.008	90	99	99	93	100	100	0	0	0
Clim	0.008	87	94	94	90	100	70	0	0	0
Clim	0.012	83	96	96	97	100	92	0	0	0
Imazethapyr + Dash + 28% N	0.063 + 1% + 1%	85	90	92	100	100	99	100	100	99
Check		0	0	0	0	0	0	0	0	0
	LSD(0.05)	9	1	2	9	0	2	0	0	1

COC- crop oil concentrate with 83% paraffin base petroleum oil, 16% surfactant, and 1% inert used at 1% on all treatments except the imazethapyr treatment and the untreated check.
28% N is urea ammonium nitrate fertilizer solution.
Dash is an adjuvant from BASF.

Time and method of herbicide application for no-till and lo-till. Knake, Ellery L., Ronald W. Heisner, and Lyle E. Paul. The purpose of this study was to compare preplant incorporated, surface applied preemergence, and postemergence herbicide treatments for no-till and lo-till crop production.

Location:	DeKalb S1400S	Exp. design:	Randomized complete block	Seeding rate:	54.5 lb/A 28,300 15 lb/A
Plot size:	10 X 120 ft				
Drainage:	fair	Replications:	3		
Organic matter:	5 to 6%	Crop:	Soybean Corn Alfalfa	Planting date:	April 25, 1991
Soil pH:	6.0				
Soil type:	Drummer silty clay loam	Variety:	Hack Pioneer 3475 Magnum	Row spacing:	30 inch
				Insecticide:	Lorsban on alfalfa 2 pt/A June 18, 1991
Slope:	0 to 1%				

Fertility: 160lb/A NH_4NO_3 on May 8, 1991 for corn following alfalfa; 200lb/A NH_4NO_3 on May 8, 1991 for corn following soybeans.
Tillage: For lo-till corn and soybeans a tandem disk with harrow was used twice for herbicide incorporation. This same tillage was also used to prepare a seedbed for alfalfa.
A tractor mounted compressed air sprayer was used traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was ten feet with nozzles spaced 20 inches apart and 20 inches above the soil surface.

Date:	April 25, 1991	May 21, 1991	May 30, 1991
Time:	7:00am to noon	4:30pm	10:00am
Treatment:	PPI, PRE, & KNO	Postemergence	Late postemergence
Temperature (F)			
air:	54	82	75
soil under sod 4 inch:	49	63	70
Soil moisture:	moist	moist	moist
Wind (mph):	7 SE	12 S	4 W
Sky (% overcast):	90	90	10
Relative humidity(%):	60	46	75
Rainfall (inch)			
previous week:	0.15	1.71	3.93
following week:	0.59	4.08	1.23
Giant foxtail			
leaf no.	1	3	4 to 5
height (inch)	0.25	3.5	5
Common ragweed			
leaf no.	2	4	
height (inch)	0.75	3.0	
Common lambsquarters			
leaf no.	4	24	
height (inch)	1.0	4	
Pennsylvania smartweed			
leaf no.	1	10	
height (inch)	1.0	4	
Alfalfa (established)		new seeding	
leaf no.	--	3 trifoliolate	
height (inch)	7	1.5	
Hairy vetch (established)		Corn	
leaf no.	--	4	
height (inch)	10	6	
Soybean			
leaf no.		2nd trifoliolate	
height (inch)		4	
Eastern black nightshade			
leaf no.		4	
height (inch)		1	

In this study, corn was planted lo-till after soybeans and no-till after alfalfa or hairy vetch. Soybeans were planted both lo-till and no-till after corn. Tillage was used to prepare a seedbed for alfalfa.

For no-till corn, dicamba with 2,4-D gave good control of alfalfa. Good control of annual weeds was achieved with a preemergence application of cyanazine and atrazine or with a postemergence application of nicosulfuron plus bromoxynil. Dicamba plus atrazine gave excellent control of hairy vetch as well as providing extended control of broadleaf weeds. A postemergence application of nicosulfuron gave good control of grass weeds, including giant foxtail and some quackgrass.

For lo-till corn using two diskings, incorporation of EPTC plus dichlormid and dietholate followed by dicamba and atrazine provided good weed control. Good control was also achieved with metolachlor and atrazine or cyanazine and atrazine followed by nicosulfuron.

For no-till soybeans, pendimethalin plus metribuzin and chlorimuron, glyphosate followed by fluazifop-P and fomesafen, and 2,4-D plus sethoxydim followed by bentazon and acifluorfen and then sethoxydim all performed relatively well.

For lo-till soybeans, incorporation of trifluralin followed by imazethapyr, pendimethalin and imazethapyr surface applied, and metribuzin and chlorimuron followed by quizalofop all performed quite well.

For establishing alfalfa, trifluralin followed by 2,4-DB dimethylamine, sethoxydim plus 2,4-DB, or imazethapyr all aided in establishing on excellent stand of alfalfa. However, imazethapyr had a definite advantage for controlling eastern black nightshade. Imazethapyr also had some advantage over 2,4-DB for control of Pennsylvania smartweed.

In summary, some excellent herbicides are available to provide considerable flexibility for tillage systems and time and method of application. Results suggest that greater acceptance of herbicides for weed control in small seeded legumes could be quite beneficial. (Dept. of Agronomy, University of Illinois, Urbana.)

Table 1. Time and method of herbicide application for no-till and lo-till (Knake, Heisner, and Paul).

Treatment	Rate	Corn 6/12	Corn 7/3	Gift 6/12	Gift 7/3	Vele 6/12	Vele 7/3	Colq 6/12	Colq 7/3
		-- injury --		---------- control ----------					
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Corn no-till after alfalfa/vetch:									
Dicamba + 2,4-D lve + cyanazine & atrazine	0.25 + 0.5 + 3.75 & 1.25	0	0	100	96	100	97	100	100
Dica + 2,4-D lve/ nicosulfuron + bromoxynil + X-77	0.25 + 0.5/ 0.031 + 0.25 + 1/4%	3	7	100	90	92	83	100	98
Dica & atra/ nicosulfuron + X-77	0.47 & 0.92/ 0.031 + 1/4%	0	0	92	82	96	88	100	100
Corn lo-till after soybeans:									
EPTC & dichlormid & dietholate/ dica & atra	4.0/ 0.47 & 0.92	0	0	94	90	100	100	100	100
Metolalchlor & atra/ nicosulfuron + X-77	2.0 + 1.6/ 0.031 + 1/4%	0	0	100	99	88	88	100	100
Cyan & atra/ nicosulfuron + X-77	3.75 & 1.25/ 0.031 + 1/4%	0	0	100	99	95	93	100	100
	LSD(0.05)	4	4	8	11	10	11	0	2

Table 2. Time and method of herbicide application for no-till and lo-till (Knake, Heisner, and Paul).

Treatment	Rate	Ebns 6/12	Ebns 7/3	Pesw 6/12	Pesw 7/3	Rrpw 6/12	Rrpw 7/3	Legume 6/12	Legume 6/12	Corn yield
		---------- control ----------								
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(bu/A)
Corn no-till after alfalfa/vetch:										
Dicamba + 2,4-D lve + cyanazine & atrazine	0.25 + 0.5 + 3.75 & 1.25	100	100	100	100	100	95	100[1]	98[1]	165.4
Dica + 2,4-D lve/ nicosulfuron + bromoxynil + X-77	0.25 + 0.5/ 0.031 + 0.25 + 1/4%	50	48	100	100	100	98	100[1]	100[1]	135.9
Dica & atra/ nicosulfuron + X-77	0.47 & 0.92/ 0.031 + 1/4%	100	100	100	100	95	87	100[2]	100[2]	167.1
Corn lo-till after soybeans:										
EPTC & dichlormid & dietholate/ dica & atra	4.0/ 0.47 & 0.92	100	100	100	100	100	100			186.1
Metolalchlor & atra/ nicosulfuron + X-77	2.0 + 1.6/ 0.031 + 1/4%	100	83	100	100	100	100			185.3
Cyan & atra/ nicosulfuron + X-77	3.75 & 1.25/ 0.031 + 1/4%	100	83	100	100	100	100			187.4
	LSD(0.05)	37	44	0	0	6	5			25.5

[1]Alfalfa cover crop.
[2]Hairy vetch cover crop.
The 2,4-D lve used was a butoxyethyl ester formulation.

Table 3. Time and method of herbicide application for no-till and lo-till (Knake, Heisner, and Paul).

Treatment	Rate	Soybean 6/12	Soybean 7/3	Gift 6/12	Gift 7/3	Vele 6/12	Vele 7/3	Colq 6/12	Colq 7/3
		-- injury --		---------- control ----------					
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Soybeans no-till after corn:									
Metribuzin & chlorimuron + pendimethalin + COC	0.28 & 0.047 + 1.0 + 1%	6	5	90	68	100	100	100	100
Glyphosate/ fluazifop-P & fomesafen + COC	0.38/ 0.188 & 0.25 + 1%	8	6	100	83	98	85	100	85
2,4-D + sethoxydim + COC/ bentazon & acifluorfen + 28% N/ seth + COC	0.5 + 0.063 + 1%/ 0.75 & 0.17 + 4%/ 0.14 + 1%	8	8	99	90	100	94	100	99
Soybeans lo-till after corn:									
Trifluralin/ imazethapyr + Sunit + 28% N	1.0/ 0.063 + 1% + 1%	0	0	100	98	100	95	100	100
Pend & imep	0.875 & 0.063	0	0	86	77	98	83	100	99
Metr & clim/ quizalofop + COC	0.35 & 0.035/ 0.044 + 1%	6	4	98	87	89	67	100	100
	LSD(0.05)	4	4	5	12	6	10	0	7

Table 4. Time and method of herbicide application for no-till and lo-till (Knake, Heisner, and Paul).

Treatment	Rate	Ebns 6/12	Ebns 7/3	Pesw 6/12	Pesw 7/3	Rrpw 6/12	Rrpw 7/3	Soybean yield
		---------- control ----------						
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(bu/a)
Soybeans no-till after corn:								
Metribuzin & chlorimuron + pendimethalin + COC	0.28 & 0.047 + 1.0 + 1%	83	83	100	100	100	100	23.0
Glyphosate/ fluazifop-P & fomesafen + COC	0.38/ 0.188 & 0.25 + 1%	100	67	99	82	100	90	20.1
2,4-D + sethoxydim + COC/ bentazon & acifluorfen + 28% N/ seth + COC	0.5 + 0.063 + 1%/ 0.75 & 0.17 + 4%/ 0.14 + 1%	100	83	100	95	100	78	23.1
Soybeans lo-till after corn:								
Trifluralin/ imazethapyr + Sunit + 28% N	1.0/ 0.063 + 1% + 1%	100	100	100	99	100	100	35.7
Pend & imep	0.875 & 0.063	100	100	100	95	100	100	38.3
Metr & clim/ quizalofop + COC	0.35 & 0.035/ 0.044 + 1%	63	33	100	95	100	99	40.2
	LSD(0.05)	47	39	1	10	1	10	11.0

COC is crop oil concentrate with 83% paraffin base petroleum oil, 16% surfactant, and 1% inert.
28% N is urea ammonium nitrate fertilizer solution.
Sunit is a methylated seed oil.

Control of hemp dogbane with sponge applications of glyphosate. Walsh, Joseph D., Ellery L. Knake, Ronald W. Heisner, and Lyle E. Paul. Hemp dogbane is a perennial weed problem throughout Illinois. Only translocated herbicides have any degree of effectiveness on controlling the weed. Glyphosate, applied with selective application equipment, appears to offer promise for hemp dogbane control in soybeans. The sponge applicator is equipped with sponges that become saturated and seldom drip. This allows for maximum coverage of plant foliage which is contacted by the sponge.

The objective of this study was to evaluate the effectiveness of the sponge applicator for control of hemp dogbane in soybeans with a 33% solution of glyphosate. The study was located in an area of natural infestation. One and two passes per application timing were made at three different stages of hemp dogbane development: vegetative, bud, and bloom of hemp dogbane.

Location:	DeKalb SW1700	Soil type:	Drummer silty clay loam	Crop:	Soybeans
Plot size:	5 X 60			Cultivar:	Hack
Drainage:	fair	Slope:	0-1%	Seeding rate:	55 lb/A
Organic matter:	4.5%	Exp. design:	Randomized complete block	Planting date:	May 30, 1991
Soil pH:	6.2			Row spacing:	30 inch
		Replications:	4	Insecticide:	N/A
Fertility:	180 lb/K_2O, November 13, 1990				
Tillage:	No-till				

Roundup burndown treatments were applied with a tractor mounted compressed air sprayer traveling 3 mph with 30 psi and 8004 flat fan nozzle tips to give 25 gpa. Width of spray was ten feet with nozzles spaced 20 inches apart and 20 inches above the soil surface. All sponge applications were made with a Super Sponge[1] mounted sponge applicator 5 feet wide. Tractor speed was 5 mph and the applicator was set approximately 6 inches above the soybeans.

Date:	May 23, 1991	June 12, 1991	June 25, 1991	July 19, 1991
Time:	3:00pm	10:00am	4:30pm	1:30pm
Timing:	Burndown	Post 1	Post 2	Post 3
Temperature (F):				
Air (ambient):	80	85	87	92
Soil 4 inch:	78	81	85	85
Soil moisture:	Moist	Moist	Dry	Dry
Wind (mph):	8 S	5 SE	7 SE	2-4 SW
Sky (% cloud):	70	20	40	10
Humidity (%):	75	75	85	65
Rainfall (inch):				
Prev. week:	2.4	1.2	0	0
Following week:	1.6	0	0	0
Hemp dogbane				
Stage	Vegetative	Vegetative	Bud	Bloom
Height (inch)	20	28-32	35-40	40-50
Soybeans				
Stage		V2	V5	R3
Height (inch)		8	15	30

All glyphosate treatments, regardless of timing or number of passes provided at least 75% control of hemp dogbane. There was a trend for 2 passes to increase efficacy over 1 pass but this trend was not significant. No difference was detected with regard to timing of herbicide application at various stages of hemp dogbane development.

Previous research indicates hemp dogbane is more susceptible to herbicides when the plant has reached the bloom stage. It is theorized that this facilitates translocation of the herbicide to the roots. In our research, no increase in efficacy was seen when hemp dogbane was treated in the bloom stage versus vegetative or bud. Control was equal at all three application stages. The first two applications were made when a 20 inch crop/weed height differential existed. This allowed for 14 inches of hemp dogbane foliage to be treated. When dogbane reached the bloom stage, the crop/weed height differential was only 10 inches. This left only 4 inches of hemp dogbane foliage to be treated. Therefore, the failure to detect differences between application timings may be a direct response to the amount of herbicide applied to the weed foliage at the time of application and not the stage of weed development.

The sponge applicator appears to have potential as a tool for delivering selective applications of glyphosate in soybeans for the control of hemp dogbane. It may be advantageous to treat dogbane when a 20 inch difference exist between the top of the soybean canopy and the top of the weed. This might allow for maximum coverage of the herbicide on the weed foliage. (Dept. of Agronomy, University of Illinois, Urbana.)

[1]Smucker Manufacturing, Inc., 22919 N. Coburg Rd., Harrisburg, OR 97446.

Table. Control of hemp dogbane with sponge applications of glyphosate. (Walsh, Knake, Heisner, and Paul).

Treatment	Rate	Hedb control
	(% v/v)	(%)
Glyphosate Burndown	2.0[1]	88
Glyphosate Post 1 1 pass	33	78
Glyphosate Post 1 2 passes	33	83
Glyphosate Post 2 1 pass	33	85
Glyphosate Post 2 2 passes	33	85
Glyphosate Post 3 1 pass	33	75
Glyphosate Post 3 2 passes	33	83
Untreated check		0
LSD=0.05		14

[1]Rate for burndown expressed in Lb ai/A

Weed control for set-aside soybeans. Walsh, Joseph D., Gary E. Pepper, and Ellery L. Knake. The experimental objective was to evaluate various herbicides and herbicide combinations for low cost, effective weed control in soybeans planted on set-aside acres.

Proper crop selection and weed control are important aspects in management of set-aside acres. Commonly, producers plant oats on set-aside acres in Illinois. Many of these situations result in high weed densities and significant additions to the weed seed bank of the soil. In addition, oats offer little or no soil building advantage aside from vegetative cover. Planting late maturing soybeans with a modest weed control program, may be advantageous for set-aside acres. The soybeans can provide ground cover while making a significant nitrogen contribution. This would allow producers to reduce the amount of nitrogen fertilizer used for subsequent crops as well as providing an additional use for soybeans.

Location:	Urbana M-3N	Soil type:	Drummer silty clay loam	Crop:	Soybeans
Plot size:	5 X 60 ft			Variety:	Coker 488
Drainage:	fair	Slope:	2.5%		Late group VIII
Organic matter:	4%	Exp. design:	Randomized complete block	Seeding rate:	90 lb/A
Soil pH:	6.4	Replications:	3	Planting date:	May 30, 1991
				Row spacing:	7 inch
				Insecticide:	None
Fertility:	None applied within 1 year of study establishment.				
Tillage:	Fall, moldboard plow; Spring disc, field cultivated twice.				

All treatments were applied using a CO_2 backpack sprayer calibrated at 32 PSI with 8002 flat fan nozzles traveling at 3 mph to deliver 14 gpa. Width of spray boom was 5 feet with 3 nozzles evenly spaced at 20 inches.

Date:	May 31, 1991	June 19, 1991
Time:	3:00pm	5:00pm
Treatment:	Pre	Post
Temperature (F)		
air:	85	88
soil under sod 4 inch:	81	83
Soil moisture:	Dry	Dry
Wind (mph):	5-7 NE	7-9 NE
Sky (% overcast):	10	30
Humidity (%):	80	75
Rainfall (inch)		
previous week:	0.6	0
following week:	0.0	0
Giant foxtail		
leaf no.		2
height (inch)		2
Redroot pigweed		
leaf no.		3
height (inch)		3-4
Velvetleaf		
leaf no.		2
height (inch)		2
Soybean		
stage		V2
height (inch)		5

The experiment was established May 30, 1991. Tillage immediately prior to planting reduced weed populations. Little rainfall was received after planting to promote further germination of weeds. Although the late tillage for planting assisted in the control of weeds, weed densities in the untreated plots disclosed the need for additional control. All treatments with the exception of bentazon plus acifluorfen at half the label rate of 0.37 + 0.08 lb/A provided good control of velvetleaf, giant foxtail, and redroot pigweed. The combination of 2,4-DB, sethoxydim, and crop oil concentrate resulted in 25% visible crop injury to soybeans which appeared as stunted plants. The 0.25 and 0.38 rates of glyphosate caused 37 and 47% visible crop injury respectively. Glyphosate injury was indicated by necrosis and reduced stand. Glyphosate caused significant injury in this study. Glyphosate tolerant soybeans of appropriate maturity could be advantageous for this purpose.

The combination of late tillage to control early germinating weeds and the use of certain low-cost herbicide treatments, appears to have some potential for weed control in soybeans planted on set-aside acres. Although soybeans are not currently permitted for set-aside, it may be feasible to allow doing so. Very late maturing soybean varieties, that will not produce seed but fix nitrogen for an extended period, could have potential for agronomic use. (Dept. of Agronomy, University of Illinois, Urbana.)

Table 5. Time and method of herbicide application for no-till and lo-till (Knake, Heisner, and Paul).

Treatment	Rate	Alfalfa 6/12	Alfalfa 7/3	Gift 6/12	Gift 7/3	Vele 6/12	Vele 7/3	Colq 6/12	Colq 7/3
		-- injury --		---------- control ----------					
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Trifluralin/ 2,4-DB	1.0/ 0.5	0	0	91	91	76	76	100	100
Sethoxydim + 2,4-DB + COC	0.14 + 0.5 + 1%	0	0	99	98	80	80	100	100
Imazethapyr + Sunit + 28% N	0.063 + 1% + 1%	0	0	98	96	92	92	85	85
	LSD(0.05)	0	0	8	9	32	32	0	0

Table 6. Time and method of herbicide application for no-till and lo-till (Knake, Heisner, and Paul).

Treatment	Rate	Ebns 6/12	Ebns 7/3	Pesw 6/12	Pesw 7/3	Rrpw 6/12	Rrpw 7/3
		---------- control ----------					
	(lb/A)	(%)	(%)	(%)	(%)	(%)	(%)
Trifluralin/ 2,4-DB	1.0/ 0.5	0	0	80	78	100	100
Sethoxydim + 2,4-DB + COC	0.14 + 0.5 + 1%	10	10	73	73	100	100
Imazethapyr + Sunit + 28% N	0.063 + 1% + 1%	100	100	99	96	100	100
	LSD(0.05)	0	0	30	22	0	0

COC is crop oil concentrate with 83% paraffin base petroleum oil, 16% surfactant, and 1% inert.
28% N is urea ammonium nitrate fertilizer solution.
X-77 is a nonionic surfactant from Valent.
Sunit is a methylated seed oil.

Table. Weed control for set-aside soybeans. (Walsh, Pepper, and Knake).

Treatment	Rate	Crop injury	Vele	Gift	Rrpw
	(lb/A)		(%)		
Cyanazine Pre	2.0	5	85	88	90
Pendimethalin + 2,4-D LVE[1] Pre	1.0 + 0.5	0	92	87	95
Pendimethalin Pre/ 2,4-DB[2] Post	1.0 + 0.2	18	82	88	95
2,4-DB + Sethoxydim[3] + COC[4] Post	0.2 + 0.125	25	87	87	92
Glyphosate Post	0.25	37	86	82	90
Glyphosate Post	0.38	47	85	80	93
Bentazon + aciflourfen + COC Post	0.75 + 0.17	13	87	73	90
Bentazon + aciflourfen + COC Post	0.37 + 0.08	0	63	50	60
Untreated		0	0	0	0
LSD=0.05		14	17	16	12

[1]Butoxyethyl ester
[2]Dimethyl amine salt formulation.
[3]Poast Plus formulation of sethoxydim.
[4]COC - crop oil concentrate with 83% paraffin base petroleum oil, 16% surfactant, and 1% inert used at 1 quart/A.

Field corn herbicide evaluation for no-till in clover sod. Tomera, Craig A., Ellery L. Knake, Gene M. Oldham. The objective of this study was to evaluate herbicide combinations for burndown of a clover cover crop, and to provide grass and broadleaf weed control in field corn. The area for this study was a Mammoth red clover crop that was established in 1990. The field corn was planted no-till. This information is useful for those using a cover crop, clover for livestock, clover for set-a-aside acres or for the long term CRP program.

This study took place in 1991 and is the second year of a study conducted at the University of Illinois Agronomy and Plant Pathology Research Farm, at Urbana, Il. on field 261-68. The soil is a Flanagan silt loam with a 1 to 2% slope and 4.5% organic matter. A randomized complete block design was used with three replications, with each plot being 10 by 50 ft. The field is in a state of high fertility, so no phosphate or potash was applied. Three ton of calcitic limestone per acre was applied in the fall of 1990. Nitrogen as ammonium nitrate was broadcast at a rate of 180 lb/acre on April 28, 1991. Initial burndown and pre emergence herbicide applications were made on April 17, 1991, except for the last treatment listed which was applied May 8,1991. On April 30, 1991, Pioneer 3362 field corn was planted at a population of 28,000 seeds per acre, in 30 inch rows. Postemergence spraying was done on May 8, 1991. Weed control ratings were made on June 30 and on August 2, 1991. Application rates, sprayer calibrations, environmental conditions and plant growth stages were:

Date	April 17	May 8	May 24
Time	5:00pm	4:00pm	3:45pm
Treatment	KNO/PRE	POST	POST
Sprayer	CO2	CO2	C02
nozzle	8002 flat fan	8002 flat fan	8002 flat fan
gpa	14	14	14
pressure (psi)	24	24	24
speed	3	3	3
Temperature			
air	60 F	80 F	87 F
soil@4"	57 F	65 F	68 F
Soil moisture	moist	moist	moist
Wind (mph)	NE 5	SW 12	SW 12
Overcast	clear	10%	3%
Relative humidity	70%	80%	80%
Surface residue	100%	20%	20%
Corn			
height (inch.)	0	10	15
leaf no.	0	6	10

Weeds

	April 17	May 8	May 24
	- - - - - - - number of leaves - - - - - - -		
Clover	many	many	slight
Common lambsquarters	4	8	8
Pennsylvania smartweed	3	7	2
Dandelion	5	0	0
Giant foxtail	0	2	6
Yellow foxtail	0	1	3
Field bindweed	0	12	14
Common milkweed	0	12	12
Velvetleaf	0	4	1

Combinations of dicamba plus 2,4-D or atrazine appeared to give the best control of the clover. Applications of cyanazine and atrazine, also provided good burn down of the clover. Weed control remained very good throughout the growing season, except for a few areas of field bindweed and a few scattered areas of eastern black nightshade. (Dept. of Agronomy, University of Illinois, Urbana)

Table 1. Field corn herbicide evaluation for no - till corn in clover sod. (Tomera, Knake, Oldham).

Treatment	Rate	Gift 6/30	Gift 8/2	Fapa 6/30	Fapa 8/2	Vele 6/30	Vele 8/2	Yield
		- - - - - - - - Control - - - - - - -						
	lb/A	(%)	(%)	(%)	(%)	(%)	(%)	(bu.)
Glyphosate + metolachlor & atrazine/ nicosulfuron + X-77	0.38 + 2.0 & 1.6/ 0.031	92	83	98	92	100	92	85
Atra + cyanazine + COC + 28%N	2.0 + 2.0	97	90	100	92	98	92	115
Cyan & atra + COC	3.0 & 1.0	92	90	100	92	98	92	128
Dicamba & atra + COC	0.48 & 0.92	92	90	85	96	95	92	124
Dica + 2,4-D/ bromoxynil & atra + nico + X-77	0.25 +0.5/ 0.25 & 0.5 0.031	83	97	90	97	93	90	129
Dica + 2,4-D/ bentazon & atra + nico + X-77	0.25 + 0.5/ 0.75 & 0.75 + 0.031	83	63	90	95	92	83	116
Dica + 2,4-D + alachlor MT + atra + COC	0.25 + 0.5 + 2.5 + 1.5	77	62	73	65	77	65	86
LSD (0.05)		5	31	4	5	4	5	19

COC - crop oil concentrate with 83% paraffin base petroleum oil, 16% surfactant, and 1% inert used at a rate of 1.0qt./a.
X-77 is a nonionic surfactant from valent used at 0.25% v/v.
28%N is a urea ammonium nitrate fertilizer used at 1.0 gal/a.
The 2,4-D was a butoxyethyl ester formulation.

Table 2. Field corn herbicide evaluation for no - till corn in clover sod. (Tomera, Knake, Oldham)

Treatment	Rate	Rrpw 6/30	Rrpw 8/2	Colq 6/30	Colq 8/2	Ebns 6/30	Ebns 8/2
		- - - - - - - Control- - - - - - - -					
	(lbs/a)	(%)	(%)	(%)	(%)	(%)	(%)
Glyphosate + metolochlor & atrazine/ nicosulfuron + X-77	0.38 + 2.0 + 1.6/ 0.031	92	83	95	90	93	85
Atra + cyanazine + COC + 28%N	2.0 + 2.0	92	80	95	85	93	85
Cyan + atra + COC	3.0 + 1.0	92	85	98	92	95	85
Dicamba & atra + COC	0.48 & 0.92	92	88	90	82	100	85
Dica + 2,4-D/ bromoxinal & atra + nico + X-77	0.25 + 0.5/ 0.25 & 0.5 +0.031	93	82	90	82	95	83
Dica + 2,4-D/ bentazon & atra + nico + X-77	0.25 + 0.5/ 0.75 & 0.75 +0.031	93	75	93	85	92	75
Dica +2,4-D + alachlor MT + atra + COC	0.25 + 0.5 +2.5 + 1.5	80	68	73	62	82	73
LSD (0.05)		5	6	6	4	5	6

COC - crop oil concentrate with 83% paraffin base petroleum oil, 16% surfactant, and 1% inert used at a rate of 1.0qt./a.
X-77 is a nonionic surfactant from valent used at 0.25% v/v.
28%N is a urea ammonium nitrate fertilizer used at 1.0 gal/a.
The 2,4-D was a butoxyethyl ester formulation.

Soybean herbicide evaluation for no-till soybeans after corn. Tomera, Craig A., Ellery L. Knake, Gene M. Oldham. In this study, the objective was to evaluate herbicides used alone or in combinations that might provide both burndown and residual control of weeds. Some herbicides have the potential for providing burndown of existing weeds and residual activity to provide season long control, precluding the need for a postemergence herbicide application and alleviating the need for tillage and cultivation.

The 1991 study is the second year for this experiment which was conducted on the University of Illinois Agronomy and Plant Pathology Farm at Urbana, Il., field 261-68. The soil is a Catlin Silt Loam with a 1 to 2% slope and 3.5% organic matter. A randomized complete block design was used, with three replications and plots each 10 by 50 ft. No fertilizer was applied due to the high state of fertility, other than three ton per acre calcitic limestone in the fall of 1990. This area was in corn in 1990. Plots were lightly disced in the fall of 1990. No spring tillage was done. Initial burndown and preemergence herbicide applications were made on May 8, 1991. On May 10, 1991, soybean cultivar Williams 82 was planted in 30 inch rows at a rate of 9 seeds per foot of row. No post plant cultivation was done, and on June 8, 1991 the postemergence herbicides were applied. Weed control ratings were made on June 30 and August 2, 1991. Application dates, sprayer calibrations, environmental conditions and plant growth stages were as follows:

Date	May 8	June 8
Treatment	KNO/PRE	POST
Time	2:00pm	9:00am
Sprayer	CO2	CO2
nozzle	8002 flat fan	8002 flat fan
gpa	14	14
pressure (psi)	24	24
speed (mph)	3	3
Temperature		
air	80 F	72 F
soil@4"	65 F	70 F
Soil moisture	moist	moist
Wind (mph)	NE 5	calm
% Overcast	10%	clear
Relative		
humidity	80%	73%
Surface residue	95%	80%
Soybean		
height (inch.)	0	8
leaf no.		
(trifoliates)	0	4

Weeds	May 8	June 8
	- - - - - - - number of leaves - - - - - - -	
Velvetleaf	3	6
Pennsylvania smartweed	4	15
Prickly lettuce	7	12
Canada thistle	6	0
Dandelion	6	8
Prostrate knotweed	10	10
Common lambsquarters	4	22
Common milkweed	6	10
Giant foxtail	1	4
Yellow foxtail	0	4
Fall panicum	0	2
Prickly sida	0	4
Prostrate pigweed	0	10
Field bindweed	0	15

Most preplant and burndown herbicide combinations controlled weeds throughout the growing season quite well. Postemergence herbicides for controlof grass weeds performed well. The postemergence herbicides for broadleaf weeds generally performed well but there were a few escapes due to the height of the weeds. This was especially true of velvetleaf, lambsquarters and pigweed. Late season hot, dry weather did not allow for full soybean canopy closure. This allowed for the developement of certain annual grasses and broadleaf weeds, especially that of prickly sida, prostrate knotweed and eastern black nightshade. (Dept. of Agronomy , University of Illinois, Urbana)

Table 1. Soybean herbicide evaluation for no - till soybeans after corn. (Tomera, Knake, Oldham).

Treatment	Rate	Bygr 6/30	Bygr 8/2	Gift 6/30	Gift 8/2	Colq 6/30	Colq 8/2
		- - - - - - - - Control - - - - - - -					
	(lbs/a)	(%)	(%)	(%)	(%)	(%)	(%)
Metribuzin & chlorimuron + COC	0.28 & 0.047	98	88	92	78	100	95
Metr & clim + clethodim + COC	0.28 & 0.047 + 0.094	100	97	95	80	100	88
Pendimethalin & imazethapyr + Dash	0.875 & 0.063	97	97	98	87	98	87
Metr & clim + COC/ quizalofop + X-77	0.28 & 0.047/ 0.044	85	77	85	75	87	83
Sulphosate + COC/ fluazifop & fomesafen + COC	0.38/ 0.188 & 0.25	95	85	95	90	95	90
2,4-D + Sethoxydim + COC/seth + COC/bentazon & acifluorfen + 28%N	0.5 + 0.063/ 0.125/ 0.75 & 0.17	95	82	90	83	98	98
CHECK		74	68	78	65	73	73
LSD (0.05)		22	34	13	19	24	24

COC- crop oil concentrate was 83% paraffin base petroleum oil, 16% surfactant and 1% inert used at a rate of 1.0qt/a.
Dash is an adjuvant from BASF used at 1.0qt/a.
X-77 is a nonionic surfactant from Valent used at 0.25% v/v.
The 2,4-D was butoxyethyl ester formulation.

Table 2. Soybean hebicide evaluation for no -till soybeans after corn. (Tomera, Knake, Oldham).

Treatment	Rate	Vele 6/30	Vele 8/2	Ebns 6/30	Ebns 8/2	Prsi 6/30	Prsi 8/2	Yield
		- - - - - - - - Control - - - - - - -						
	(lbs/a)	(%)	(%)	(%)	(%)	(%)	(%)	(bu.)
Metribuzin & chlorimuron + COC	0.28 & 0.047 +	97	95	93	83	95	87	32
Metr & clim + clethodim + COC	0.28 & 0.047 + 0.094	100	92	98	88	100	97	35
Pendimethalin & imazethapyr + Dash	0.875 & 0.063	100	93	93	88	100	92	25
Metr & clim + COC/ quizalofop + X-77	0.28 & 0.047/ 0.044	90	85	88	73	93	78	40
Sulphosate + COC/ fluazifop & fomesafen + COC	0.381/ 0.188 & 0.25	97	90	93	77	90	70	25
2,4-D + sethoxydim + COC/seth + COC/bentazon & acifluorfen + 28%N	0.5 + 0.063/ 0.125/ 0.75 + 0.17	98	75	88	77	95	70	30
CHECK		85	75	88	77	95	70	15
LSD (0.05)		16	21	17	15	15	31	8

COC- crop oil concentrate was 83% paraffin base petroleum oil, 16% surfactant and 1% inert used at a rate of 1.0qt/a.
Dash is an adjuvant from BASF used at 1.0qt/a.
The 2,4-D was butoxyethyl ester formulation.
X-77 is a nonionic surfactant from Valent used at 0.25% v/v.

Evaluation of herbicides for clover establishment. Tomera, Craig A., Ellery L. Knake, Gene M. Oldham. In this study, the objective was to evaluate herbicides for the control of grass and broadleaf weeds in seedling clover. This was done so that a vigorous clover stand could develop in the first year, allowing it to provide a good cover crop for the following year's corn crop, and also to help reduce weed competition in the clover as well as the following year's corn crop. This study, a continuation of the 1990 study, was conducted at the University of Illinois Agronomy and Plant Pathology Research Farm at Urbana, Il. on field 261-68. The soil is a Flanagan silt loam with a 1 to 2% slope and 4.5% organic matter. A randomized complete block design was used with three replications, and individual plots of 10 by 50 ft. The field was in a high state of fertility, so no fertilizer was applied other than 3.0 ton per acre calcitic limestone in the fall of 1990. Plots were fall disced and spring tillage consisted of one pass with a field cultivator and one pass with a soil finisher. Preplant incorporated treatments were applied and were followed by one pass with a soil finisher on April 17. Later that same afternoon, Mammoth red clover was seeded with a Brillion seeder at a rate of 12 pounds per acre. Weed control ratings were made on June 30 and August 2, 1991. Application dates, sprayer calibration, environmental conditions and plant growth stages were as follows:

Date	April 17	May 8
Time	8:00am	3:30pm
Treatment	PPI	POST
Sprayer	CO2	CO2
nozzle	8002 flat fan	8002 flat fan
gpa	14	14
pressure(psi)	24	24
speed(mph)	3	3
Temperature		
air	55 F	65 F
soil@4 inch	57 F	80 F
Soil moisture	moist	moist
Wind (mph)	NE 5	SW 10
Overcast %	foggy	10%
Relative		
humidity	80%	70%
Clover height	0	3.0 inches

Weeds	April 17	May 8
	--------Number of leaves--------	
Yellow foxtail	0	2
Giant foxtail	0	3
Redroot pigweed	0	3
Common lambsquarters	0	6
Field bindweed	0	6
Common milkweed	0	8
Prickly lettuce	0	6
Eastern black nightshade	0	2
Common purslane	0	8
Hairy Vetch	many	many

In this study, the postemergence applications gave much better weed control than did the preplant incorporated herbicides. This was especially true for grass weed control. Moderate injury was noted on the clover as leaf crinkling due to the 2,4-DB application, which only gave moderate control of velvetleaf, redroot pigweed and eastern black nightshade. Clover establishment was slow due to crusting of the soil surface, and later on due to the hot, dry weather conditions that prevailed. (Dept. of Agronomy, University of Illinois, Urbana)

Table 1. Herbicide evaluation for clover establishment (Tomera, Knake, Oldham).

Treatment	Rate	Gift 6/30	Gift 8/2	Yeft 6/30	Yeft 8/2	Rrpw 6/30	Rrpw 8/2
		- - - - - - - - Control - - - - - - -					
	(lbs/a)	(%)	(%)	(%)	(%)	(%)	(%)
Sethoxydim + COC + Mowing	0.125	100	93	100	97	100	100
EPTC/2,4-DB	3.0/0.5	82	60	85	67	100	92
Trifluralin/ 2,4-DB	0.75/ 0.5	82	58	87	70	100	88
Pendimethalin/ 2,4-DB	0.75/ 0.5	82	60	88	72	100	88
Seth + 2,4-DB + COC	0.125 + 0.5	100	95	100	93	88	78
Seth + 2,4-DB + COC	1.88 + 0.5	100	100	98	97	93	78
Fenoxaprop & fluazifop + 2,4-DB + COC	0.125 & 0.035 + 0.5	100	97	100	93	88	75
Quizalofop + 2,4-DB + COC	0.044 + 0.5	90	78	100	88	90	88
CHECK - Oats		35	32	52	23	63	55
LSD (0.05)		12	9	20	21	5	13

COC - crop oil concentrate was 83% parafin base petroleum oil, 16% surfactant and 1% inert used at a rate of 1.0qt/a.
2,4-DB was a Dimethylamine salt formulation
Sethoxydim was the Poast formulation.

Table 2. Herbicide evaluation for clover establishment (Tomera, Knake, Oldham).

Treatment	Rate	Vele 6/30	Vele 8/2	Ebns 6/30	Ebns 8/2	Colq 6/30	Colq 8/2
		- - - - - - - - Control - - - - - - -					
	(lbs/a)	(%)	(%)	(%)	(%)	(%)	(%)
Sethoxydim + COC + Mowing	0.125	85	67	83	62	80	80
EPTC/ 2,4-DB	3.0/0.5	97	85	90	70	97	97
Trifluralin/ 2,4-DB	0.75/ 0.5	97	87	90	70	97	97
Pendimethalin/ 2,4-DB	0.75 0.5	95	87	90	70	97	95
Seth + 2,4-DB + COC	0.125 + 0.5	93	82	92	77	97	97
Seth + 2,4-DB + COC	1.88 + 0.5B	100	87	83	72	95	92
Fenoxaprop & fluazifop + 2,4-DB + COC	0.125 & 0.035 + 0.5	95	87	88	70	93	92
Quizalofop + 2,4-DB + COC	0.044 + 0.5	100	88	90	80	100	97
Checks - Oats		72	58	82	60	90	75
LSD (0.05)		7	10	7	19	8	11

COC - crop oil concentrate was 83% paraffin base petroleum oil, with 16% surfactant and 1% inert used at a rate of 1.0Qt/A.
2,4-DB was the Dimethylamine salt formulation.
Sethoxydim was the Poast formulation.

Interaction of soil-applied terbufos formulations and nicosulfuron for corn. Pike, David R., Ellery L. Knake, and Kevin Steffey. The objective of this experiment was to evaluate two formulations of terbufos applied as an in-furrow application for interactions with postemergence nicosulfuron. The study was conducted in 1991 at the Orr Research Center near Perry Illinois. The soil was a Herrick silt loam and Clarksdale silt loam with 1.8% organic matter and a slope of 0 to 2%. The pH was determined in the fall of 1989 as 5.8, the P_1 was 56 and the K was 278. Corn hybrid FS-6774 was planted June 26, 1991 at a population of 26,100 per acre. Corn preceded corn planted in 1991. All herbicide applications were made with a tractor mounted sprayer set to deliver 25 GPA at 30 PSI. The plot area was treated with cyanazine at 2.7 lb/A and atrazine at .9 lb/A. The entire plot area was also treated with glyphosate at 1 lb/A and paraquat at 1 lb/A for knockdown of existing vegetation prior to planting. Two hundred pounds per acre of anhydrous N was applied. No fall or spring tillage was done. Soil insecticides were applied in-furrow at planting. Nozzle types were 8004 FF. Post emergence treatments were applied 12 July 1991. The prevailing temperatures during spraying operations were between 72 and 82 degrees F. Two inches of rainfall was received within seven days prior to post emergence applications resulting in excellent growing conditions. All plots were hand weeded. The rate of nicosulfuron used conformed to the newly issued product label.

Results from the study indicate serious reductions in both plant height and grain yield from a resultant interaction between applications of terbufos (Counter 15G) and nicosulfuron (Accent) as well as a significant interaction between terbufos (Counter 20CR) and nicosulfuron. Reductions in plant height and yield up to 80% were noted for interactions between nicosulfuron and terbufos.

Table. Interaction of soil-applied terbufos formulations and nicosulfuron for corn (Pike, Knake, Steffey).

	Treatment	Rate	Appl Time	Corn height 7/23/91	Corn Yield 1991
		Lb/A		Inches	Bu/A
1	Terbufos 15G	1.0	In furrow	37.5	137.6
2	Terbufos 20CR	1.0	In furrow	37.7	117.6
3	Nicosulfuron	0.031+[1]	Post	34.7	112.2
	X-77	0.25%			
4	Terbufos 15G	1.0	In furrow	18.4	23.7
	nicosulfuron	0.031	Post		
	X-77	0.25%			
5	Terbufos 20CR	1.0	In furrow	15.6	23.6
	nicosulfuron +	0.031	Post		
	X-77	0.25%			
6	Check			37.3	135.0
LSD (0.05)				3.2	35.5

Interaction of soil-applied insecticides and postemergence herbicides for corn. Pike, David R., Ellery L. Knake, and Kevin Steffey. The objective of this research is to determine the nature and level of interference between applications of nicosulfuron and the insecticides terbufos and DPX-43898 (Fortress). The study was established at the Orr Research and Demonstration Center near Perry, Illinois. The soil was a Herrick silt loam and Clarksdale silt loam with 1.8% organic matter and a slope of 0 to 2%. The pH was determined in the fall of 1989 as 5.8, the P_1 was 56 and the K was 278. Corn hybrid FS-6774 was planted June 4, 1990 and June 26, 1991 at populations of 26,100 per acre. Soybeans preceded the corn planted in 1990 and corn preceded the corn planted in 1991. The plot area was treated with cyanazine at 2.7 lb/A and atrazine at .9 lb/A. In 1991 the plot area was treated with glyphosate at 1 lb/A and paraquat at 1 lb/A for knockdown of existing vegetation prior to planting. Two hundred pounds per acre of anhydrous N was applied. In 1990 the ground was disked followed by Dino-drive. No fall tillage or spring tillage was done in 1991. Plot size was 10 x 50 ft. Soil insecticides were applied at planting in a seven inch band over the row or applied in-furrow as indicated. Postemergence herbicides were applied with a tractor mounted sprayer delivering 25 gallons per acre at a pressure of 30 PSI. Nozzle types were 8004 FF. Post emergence treatments were applied 26 June 1990 and 12 July 1991. The prevailing temperatures during spraying operations were between 72 and 82 degrees F both years. Upwards of 2 inches of rainfall were received within seven days prior to post emergence applications in both years resulting in excellent growing conditions. All plots were hand weeded. The rate of nicosulfuron used in 1991 was reduced from the rate used in 1990 to conform to the newly issued product label.

Soil insecticide and postemergence herbicide applications were evaluated for interaction in a study conducted in 1990 and 1991. Results from the study indicate serious reductions in both plant height and grain yield from a resultant interaction between applications of terbufos (Counter) and nicosulfuron (Accent). Little interaction was noted between DPX-43898 (Fortress) and nicosulfuron in either year. Reductions in plant height and yield up to 87% were noted for interactions between nicosulfuron and in-furrow applications of terbufos.

Table 1. Soil insecticide - herbicide interaction (Pike, Knake, Steffey).

	Treatment	Rate		Corn height 7/16/90	Corn height 7/23/91	Corn Yield 1990	Corn Yield 1991
		Lb/A		------inches------		-----Bu/A-----	
1	Terbufos	1.0	Banded	19	19	74.8	30.7
	nicosulfuron	0.06[1] +	Post				
	X-77	0.25%					
2	Terbufos	1.0	In-Furrow	13	17	77.3	14.9
	nicosulfuron	0.06	Post				
	X-77	0.25%					
3	DPX-43898	0.5	Banded	42	37	134.8	113.8
	nicosulfuron	0.06	Post				
	X-77	0.25%					
4	DPX-43898	0.5	In-furrow	43	38	138.4	129.2
	nicosulfuron	0.06					
	X-77	0.25%					
5	Nicosulfuron	0.06	Post	39	37	128.6	106.0
	X-77	0.25%					
6	Check			39	34	137.7	111.7
LSD (0.05)				8	4	19.9	26.3

[1] The rate of nicosulfuron was reduced from 0.06 lb/A in 1990 to 0.03 lb\A in 1991.

The use of banded herbicide applications and cultivation for weed control in corn. Pike, David R., Michael J. Mainz, and Glenn A. Raines. The objective of this study was to determine the effectiveness of banded herbicide treatments in combination with cultivation compared to conventional broadcast pre and postemergence applications. This study was established at the Northwestern Illinois Agronomy Research Station near Monmouth, Illinois and at the Orr Research and Demonstration Center near Perry, Illinois. Corn (Sieben 43XS) was planted May 1, 1991 at Monmouth and April 30, 1991 at the Orr center (Pioneer 3241). All herbicide applications were made with a tractor mounted sprayer set to deliver 25 GPA at 30 PSI. Preemergence banded treatments were applied with 4004 nozzles. Preemergence applications were applied on May 2, 1991 at both locations with 65 to 70 degree F air temperatures. Postemergence applications at the Monmouth location were applied on May 28, 1991 in 8 to 12 mph winds at 70 degrees F and a relative humidity of 70 percent. When post applications were made at this location giant foxtail was 5 to 6 inches tall and velvetleaf was 4 to 5 inches tall. Postemergence treatments at the Orr location were applied June 4, 1991 with 75 degree F air temperatures in an 8 to 10 mph wind. On the date of post applications the giant foxtail at this location was 6 to 18 inches tall and pigweed, lambsquarters and pennsylvania smartweed were 12 to 24 inches tall. No single broadleaf species at this location was distributed evenly enough for independent ratings. Regular rains at the Orr center prevented timely application of postemergence herbicides and appropriate cultivation.

At both locations the highest yielding treatment was atrazine + metolachlor applied as a broadcast application. The poorest weed control and lowest yields resulted from atrazine + COC, atrazine + bentazon + COC, atrazine + dicamba + COC and the treatment receiving only cultivation. Treatments containing nicosulfuron also yielded less than broadcast preemergence herbicide treatments suggesting that by the late date of application some yield reduction from weed competition had already occurred. Because postemergence applications at Monmouth (Table 1) were applied when weeds were much smaller yields from postemergence treatments were not as affected at this location compared with the Orr location (Table 2).

Table 1. The use of banded herbicide applications and cultivation for weed control in corn (Pike, Mainz, Raines)

	Treatment	Rate	Appl. Time	Control Gift	Control Vele	Yield
		Lb/A		-------%------		Bu/A
1	Atrazine + metolachlor	1.0+ 2.0	Pre	97	88	172.2
2	Atrazine cultivation	1.5	Pre Band	78	97	132.1
3	Metolachlor cultivation	2.0	Pre Band	72	88	139.3
4	Atrazine + metolachlor	1.5+ 2.0	Band	72	95	124.4
5	Bentazon + atrazine + Activator COC	0.75+ 0.75+ 1.0%	Post	10	97	43.7
6	Dicamba + atrazine + Activator COC	0.5+ 0.9+ 1.0%	Post	12	98	48.7
7	Atrazine + Activator COC	1.4+ 1.0%	Post	20	94	85.4
8	Metolachlor	2.0	Pre	94	71	151.8
9	Cyanazine + atrazine	2.25+ 0.75	Pre	85	89	170.4
10	Nicosulfuron + atrazine + Activator COC	0.04+ 1.0+ 1.0%	Post	96	98	159.2
11	Nicosulfuron + bromoxynil + X-77	0.04+ 0.25+ 0.25%	Post	95	99	150.8
12	Nicosulfuron + atrazine + bentazon + X-77	0.04+ 0.9+ 0.5+ 0.25%	Post	96	98	156.8
13	Nicosulfuron + X-77 cultivation	0.04+ 0.25%	Post	95	97	147.7
14	Cultivation			55	82	70.8
CV				10	9	8.6
LSD (0.05)				10	12	15.4

Table 2. The use of banded herbicide applications and cultivation for weed control in corn (Pike, Mainz, Raines).

	Treatment	Rate	Appl. Time	Control Gift	Control Bdlv[1]	Yield
		Lb/A		-------%------		Bu/A
1	Atrazine + metolachlor +	1.0+ 2.0	Pre	94	97	164.9
2	Atrazine + cultivation	1.5+	Pre Band	70	94	72.2
3	Metolachlor + cultivation	2.0+	Pre Band	76	71	115.5
4	Atrazine + metolachlor	1.5+ 2.0	Band	77	76	126.1
5	Bentazon + atrazine + Activator COC	0.75+ 0.75+ 1.0%	Post	20	63	74.0
6	Dicamba + atrazine + Activator COC	0.5+ 0.9+ 1.0%	Post	22	88	67.3
7	Atrazine + Activator COC	1.4+ 1.0%	Post	12	65	73.4
8	Metolachlor	2.0	Pre	63	13	104.9
9	Cyanazine + atrazine	2.25+ 0.75	Pre	73	90	133.2
10	Nicosulfuron + atrazine + Activator COC	0.04+ 1.0+ 1.0%	Post	49	49	136.5
11	Nicosulfuron + bromoxynil + X-77	0.04+ 0.25+ 0.25%	Post	54	58	116.0
12	Nicosulfuron + Atrazine + Bentazon + X-77	0.04+ 0.9+ 0.5+ 0.25%	Post	38	50	123.9
13	Nicosulfuron + X-77 Cultivation	0.04+ 0.25%	Post	86	89	121.7
14	Cultivation			61	73	100.2
CV				34	35	20.1
LSD (0.05)				28	34	31.5

[1] Species rated include redroot pigweed, common lambsquarters, and pennsylvania smartweed.

The use of banded herbicides and cultivation for weed control in soybeans Pike, David R., Michael J. Mainz, and Glenn A. Raines. The objective of this study was to determine the effect of banded herbicides and cultivated treatments on weed control and grain yield of soybeans. This study was established at the Northwestern Illinois Agronomy Research Station at Monmouth Illinois and at the Orr Research Station near Perry Illinois. All herbicide applications were made with a tractor mounted sprayer set to deliver 25 GPA at 30 PSI. Preemergence banded applications were made with 4004 nozzles. Soybeans (variety Steine 3940) were planted at the Monmouth Center on May 1, 1991 with preemergence treatments applied on May 2, 1991. Postemergence treatments were applied May 28, 1991 with air temperatures of 85 degrees F and a relative humidity of 70 percent. Time of spraying was 10 a.m. Giant foxtail was 4 to 6 inches tall and velvetleaf was 4 to 5 inches tall. At the Orr Research Center the soybeans (variety Pioneer 9301) were planted on April 30, 1991. Preemergence treatments were applied on May 2, 1991 under 70 degree F temperatures. Postemergence treatments were applied on June 4, 1991 with temperatures at 75 degrees F in 12 to 14 mph winds. Foxtails, the predominant grass, were 2 to 3 inches tall at postemergence application. At the Monmouth location the predominant broadleaf weed was velvetleaf whereas at the Orr location there were light infestations of lambsquarters, smartweed, and cocklebur. At the Orr location the broadleaf weeds were unevenly spread across the study area and could not be evaluated as individual species. Regularly occurring rains at the Orr Research Center prevented timely postemergence application and many of the weeds were 12 to 18 inches tall at the time of post treatments. After the postemergence applications were applied additional rains resulted in a flush of large crabgrass invading all plots at this location.

At the Monmouth location (Table 1) the cultivation treatment resulted in a 50 percent decrease in yield compared to highest yielding treatment of a broadcast application of imazethapyr and pendimethalin. The use of pendimethalin in combination with cultivation also resulted in yields lower than all other treatments except the cultivation treatment. The chlorimuron plus metribuzin plus metolachlor treatment with and without cultivation yielded nearly as well as the broadcast preemergence treatment of imazethapyr plus pendimethalin. At the Orr location (Table 2) the treatment which received only cultivation yielded 79% of the highest yielding treatment of a preemergence broadcast application of chlorimuron + metribuzin + metolachlor. The late season weed pressure brought about by heavy rains at the Orr location reduced yields throughout the study.

Table 1. The use of banded herbicides and cultivation for weed control in soybeans (Pike, Mainz, Raines)

	Treatment	Rate	Appl. Time	Control Gift	Vele	Yield
		Lb/A		-------%------		Bu/A
1	Chlorimuron + metribuzin + pendimethalin	0.04+ 0.24+ 1.0	Pre	74	98	55.1
2	Chlorimuron + metribuzin + metolachlor	0.04+ 0.24+ 2.0	Pre	94	97	59.3
3	Chlorimuron + metribuzin + sethoxydim + Dash	0.04+ 0.24+ 0.0625+ 1.0%	Pre Post	93	97	56.0
4	Chlorimuron + metribuzin cultivation	0.04+ 0.24	Pre Band	81	91	48.9
5	Pendimethalin cultivation	1.0	Pre Band	63	73	36.4
6	Metolachlor cultivation	2.0	Pre Band	80	86	50.0
7	Chlorimuron + metribuzin + metolachlor cultivation	0.04+ 0.24+ 2.0	Pre Band	86	96	58.1
8	Sethoxydim + bentazon + acifluorfen + Dash	0.0625+ 0.75+ 0.17+ 1.0%	Post	92	96	54.1
9	Imazethapyr + pendimethalin	0.06+ 0.84	Pre	96	98	63.3
10	Cultivation			62	80	32.3
CV				11.1	10.9	11.1
LSD (0.05)				13.2	14.4	8.3

Table 2. The use of banded herbicides and cultivation for weed control in soybeans (Pike, Mainz, Raines).

	Treatment	Rate	Appl. Time	Control Gift[1]	Control Bdlv[2]	Yield
		Lb/A		-------%------		Bu/A
1	Chlorimuron + metribuzin + pendimethalin	0.04 + 0.24 + 1.0	Pre	70	83	27.5
2	Chlorimuron + metribuzin + metolachlor	0.04 + 0.24 + 2.0	Pre	65	66	28.4
3	Chlorimuron + metribuzin + sethoxydim + Dash	0.04 + 0.24 + 0.0625 + 1.0%	Pre Post	79	71	22.5
4	Chlorimuron + metribuzin cultivation	0.04 + 0.24	Pre Band	64	81	19.1
5	Pendimethalin cultivation	1.0	Pre Band	60	63	20.0
6	Metolachlor cultivation	2.0	Pre Band	71	71	21.1
7	Chlorimuron + metribuzin + metolachlor cultivation	0.04 + 0.24 + 2.0	Pre Band	79	90	22.9
8	Sethoxydim + bentazon + acifluorfen + Dash	0.0625 + 0.75 + 0.17 + 1.0%	Post	55	79	11.8
9	Imazethapyr + pendimethalin	0.06 + 0.84	Pre	90	70	24.4
10	Cultivation			67	70	22.3
CV				31	31	24.8
LSD (0.05)				32	34	7.9

[1] Large crabgrass overgrew the study area late in the season.
[2] Species rated include common lambsquarters, redroot pigweed and pennsylvania smartweed.

Evaluation of postemergence herbicides for control of weeds in soybeans, Monmouth, Illinois. Pike, David R. and Michael J. Mainz. The objective of this experiment was to evaluate several newly registered postemergence herbicides for weed control in soybeans. A preemergence herbicide and cultivation were used as control treatments. This study was established at the northwestern Illinois agronomy research station at Monmouth Illinois in 1991. The soybeans (variety Steine 3940) were planted May 1st into soil that was disked and field cultivated. All herbicide applications were made with a tractor mounted sprayer set to deliver 25 GPA at 30 PSI. The preemergence treatments were applied on May 2nd at 8 a.m. under calm conditions. Post emergence treatments were applied on the 28th of May at 10 a.m. in 8 to 12 m.p.h. winds. Prevailing temperatures were in the range of 80 to 85 degrees F with a relative humidity of 70 percent. Foxtails were 5 to 6 inches tall at the time of postemergence applications. Velvetleaf plants, the predominant broadleaf at that time, were 4 to 5 inches tall.

Results of the study indicate that imazethapyr, when applied alone either preemergence or postemergence resulted in 68% grass control compared to 90 to 95% grass control from other pre and postemergence treatments. Postemergence applications of imazethapyr also resulted in broadleaf weed control and yields about 20% lower than broadcast preemergence treatments. Yields from quizalofop + bentazon + acifluorfen and cultivated treatments also resulted in yields lower than either preemergence treatment. No differences in yield were noted between postemergence imazethapyr treatments based upon use of adjuvants. The treatment receiving only cultivation resulted in 24 percent less weed control and 38 percent lower yields than the preemergence treatments.

Table. Evaluation of postemergence herbicides for control of weeds in soybeans, Monmouth, Illinois (Pike, Mainz).

	Treatment	Rate	Appl. Time	Control Gift	Control Vele	Yield
		Lb/A		-------%------		Bu/A
1	Imazethapyr	0.06	Pre	78	98	61.7
2	Imazethapyr + pendimethalin	0.06+ 0.84	Pre	92	98	62.0
3	Sethoxydim + bentazon + acifluorfen + Dash	0.063+ 0.75+ 0.17+ 1.0%	Post	95	95	54.3
4	Quizalofop + bentazon + acifluorfen + Activator COC	0.08+ 0.75+ 0.17+ 1.0%	Post	92	96	49.8
5	Fomesafen + fluazifop + Activator COC	0.37+ 0.19+ 1.0%	Post	90	94	56.7
6	Imazethapyr + Dash	0.06+ 1.0%	Post	67	72	45.3
7	Imazethapyr + Activator COC	0.06+ 1.0%	Post	67	74	39.4
8	Imazethapyr + Sunnit	0.06+ 1.0%	Post	70	75	43.5
9	Imazethapyr Prime oil II VOC	0.06 1.0%	Post	68	67	37.0
10	Chlorimuron + thifensulfuron + quizalofop + 28%(UAN) + Activator COC	0.004+ 0.004+ 0.044+ 4.0%+ 1.0%	Post	92	87	55.5
11	Chlorimuron + thifensulfuron + quizalofop + X-77 NIS + Activator COC	0.004+ 0.004+ 0.044+ 0.25%+ 1.0%	Post	94	89	55.6
12	Cultivated			72	84	37.5
CV				6	11	11.5
LSD (0.05)				8	13	8.2

Summaries for 1991
Weed Science Research at the
Northern Illinois Agronomy Research Center

Efficacy of nicosulfuron and primisulfuron on perennial grasses and legumes.

Nicosulfuron did not give good control of established Kentucky bluegrass, smooth bromegrass, orchardgrass, tall fescue or Reed canarygrass. However, nicosulfuron did control timothy relatively well. Control of these grasses with primisulfuron was less than with nicosulfuron except for smooth bromegrass. Except for the possibility of nicosulfuron on timothy, control was not considered commercially adequate. Results suggested the possibility of Kentucky bluegrass having adequate tolerance to allow selective use of primisulfuron. Tall fescue and orchardgrass may also be in this same category. For alfalfa and red clover, control with primisulfuron was relatively good and nicosulfuron gave partial control. This suggests that these compounds may be useful for additional control of alfalfa or clover, for example, in no-till corn where an earlier treatment did not give complete control. Control of alfalfa or red clover in soybeans, especially with primisulfuron, may also be a possibility if sulfonylurea tolerant soybeans were used. Glyphosate provided good control of Kentucky bluegrass, timothy, and Reed canarygrass; relatively good control of orchardgrass, red clover and alfalfa; but had only modest effect on smooth bromegrass and tall fescue under the conditions of this study.

Single herbicide applications for weed control in no-till soybeans after corn.

Metribuzin and chlorimuron in either a 6:1 or 10:1 ratio provided broad spectrum control of broadleaf weeds but only fair control of giant foxtail. Addition of pendimethalin, alachlor or metolachlor improved control of giant foxtail but control was not complete. Addition of clethodim or haloxyfop to metribuzin and chlorimuron was only partially successful in providing residual as well as burndown of grass weeds. Imazethapyr plus pendimethalin provided excellent control of the spectrum of broadleaf weeds present and good control of giant foxtail. Clomazone alone or in combination with metribuzin, metribuzin and chlorimuron, or pendimethalin provided excellent broad spectrum control of both broadleaf and grass weeds.

Sequential herbicide applications for weed control in no-till soybeans after corn.

Paraquat plus metribuzin followed by fluazifop-P, metribuzin and chlorimuron followed by quizalofop or clethodim, and acifluorfen plus metribuzin followed by sethoxydim all provided very good broad spectrum weed control. Early application of 2,4-D or 2,4-DB plus sethoxydim performed well. And acifluorfen plus 2,4-D early followed by bentazon plus acifluorfen and then sethoxydim also performed very well. Glyphosate or sulphosate followed by fomesafen and fluazifop-P gave good control of giant foxtail but incomplete control of broadleaf weeds. Similarly, fomesafen followed by fluazifop-P gave good control of giant foxtail but not all of broadleaf weeds. Lactofen followed by clethodim plus lactofen performed well except on common lambsquarters.

Substituting thifensulfuron for chlorimuron with metribuzin followed by quizalofop gave excellent broadleaf weed control and appeared to control the early emerging giant foxtail but not that which emerged after application of the quizalofop.

Multi-species evaluation of soil-applied herbicides.

Performance of dry flowable formulations of trifluralin was very similar to that of the EC formulation whether used alone or in various combinations. No problems were encountered in mixing or application of the dry flowables. The dry formulation of alachlor also performed well.

Of the various genetic lines of corn from the Independent Professional Seedsmen Association (IPSA) IPSA C1128 and IPSA C8004 appeared to be least vigorous; IPSA C1284, IPSA C4843, and IPSA C6114 moderate; and IPSA C6973 most vigorous. In general, the more vigorous lines appeared to be more tolerant of herbicides. There appeared to be little difference in the degree of tolerance for the soybean cultivars with the soil-applied herbicides. Canola exhibited good tolerance to trifluralin. Hairy vetch exhibited relatively good tolerance to trifluralin and to imazethapyr but was controlled with atrazine or a metribuzin and chlorimuron combination. Except for trifluralin and ethalfluralin, tolerance of sunflower was generally not adequate. There was little indication of adequate tolerance with most treatments for use in sorghum, wheat, or oats. Alfalfa generally exhibited relatively good tolerance to trifluralin, pendimethalin, ethalfluralin, imazethapyr and EPTC.

Control of redroot pigweed and common lambsquarters was excellent with nearly all treatments. Except for the dinitroanilines, control of common ragweed was also quite good. Except for the dinitroanilines and acetanilides, most treatments gave good control of velvetleaf; however, metribuzin plus chlorimuron was better than chlorimuron or thifensulfuron alone.

For common cocklebur, some of the more effective treatments included metribuzin plus chlorimuron, atrazine, bentazon, chlorimuron, and lactofen. Most treatments controlled jimsonweed rather well except the dinitroanilines and clomazone. Control of ivyleaf and tall morningglory was quite similar with the various treatments; treatments which included atrazine were generally most effective with many other treatments giving only partial control. While most sulfonylureas and dinitroanilines provided little or no help for eastern black nightshade, imazethapyr, atrazine, the acetanilides, lactofen and acifluorfen were effective. Most treatments gave relatively good control of most annual grass weeds. However, control of annual grass with metribuzin and chlorimuron was only fair. Observations suggested an antagonistic effect of imazethapyr on annual grass control with EPTC.

Of the relatively new compounds XRM 5313 indicated relatively good soybean tolerance, good control of most annual grass weeds; and compared to trifluralin alone, significant improvement in control of velvetleaf, jimsonweed, eastern black nightshade, and common ragweed as well as partial control of common cocklebur and common sunflower, but little additional help on annual morningglories. Lack of adequate tolerance would likely preclude use on sunflower and canola, but alfalfa and hairy vetch appeared to have moderate tolerance.

MON 13280 gave control of the foxtails with a rate response, was better on large crabgrass, poor on barnyardgrass, and had activity on shattercane. It gave good control of redroot pigweed, common lambsquarters, and eastern black nightshade and had some activity on velvetleaf, jimsonweed, annual morningglories and common ragweed. Combination with imazethapyr or metribuzin and chlorimuron significantly improved control of most broadleaf weeds and also of some grass weeds. Degree of crop tolerance would likely preclude use on the crops included in this study other than soybeans.

Acetachlor generally provided good control of grass weeds, redroot pigweed, common lambsquarters, eastern black nightshade, common ragweed, and jimsonweed. When incorporated it had activity on velvetleaf. Addition of atrazine further enhanced control. Crop tolerance could be of more concern than with alachlor, making the addition of a safening agent worthy of consideration.

Multi-species evaluation of postemergence herbicides.

The dry water soluble crystals of the dimethylamine salt of 2,4-D performed in a very similar manner as the liquid formulation of the dimethylamine salt at comparable rate. The dry formulation could offer some convenience. The combination of 2,4-D and atrazine provided weed control very similar to dicamba and atrazine. Although corn tolerance appeared to be relatively adequate in this trial, previous experience suggests some caution.

Corn exhibited good tolerance to pyridate and to CL 23601 except for slight effect when pyridate was mixed with cyanazine. Spectrum of control for pyridate combined with atrazine or cyanazine and for CL 23601 combined with atrazine was quite broad for both grass and broadleaf weeds. Pyridate or CL 23601 combined with nicosulfuron or primisulfuron provided good corn tolerance and fairly broad spectrum weed control with spectrum depending somewhat on the relative strength of nicosulfuron and primisulfuron with nicosulfuron more effective on most grass weeds and primisulfuron more effective on some broadleaf weeds. Although pyridate plus sethoxydim provided good weed control, crop tolerance appeared too limited for this combination to be promising for newly established alfalfa or any other crop included in the study.

A low rate of metribuzin plus bentazon provided good control of broadleaf weeds with only slight effect noted on corn. Similarly, a low rate of metribuzin with 2,4-D dimethylamine or butoxyethyl ester provided excellent broadleaf weed control with little effect on corn.

Sethoxydim plus bentazon and acifluorfen gave excellent broad spectrum weed control with minimal effect on soybeans.

Comparison of various adjuvants with imazethapyr indicated Dash (an adjuvant from BASF) and Sunit II (a methylated seed soil) to be quite similar in performance and both slightly more effective than X-77 (an adjuvant from Valent).

Under the conditions of this study, 0.125 lb/A of fluazifop-P was nearly as effective as 0.188 lb/A. Fluazifop-P plus fenoxaprop gave excellent control of all grasses, including "volunteer" corn. The same combination plus fomesafen provided excellent broad spectrum control of both grass and broadleaf weeds except common lambsquarters and control of it was improved by addition of a dimethylamine formulation of 2,4-DB. Flazifop-P plus fomesafen also provided excellent control of nearly all grass and broadleaf weeds.

With the exception of annual morningglories, combinations of imazethapyr plus nicosulfuron or primisulfuron provided excellent broad spectrum weed control but excessive corn injury indicated that an imazethapyr tolerant line would be

needed. Except for weakness on large crabgrass, nicosulfuron gave very good control of grass weeds. Primisulfuron was less effective than nicosulfuron on most grass species and especially weak on large crabgrass and barnyardgrass. However, primisulfuron was more effective on several broadleaf weed species than nicosulfuron, including common cocklebur, velvetleaf, jimsonweed, eastern black nightshade, and common sunflower.

With these contrasting characteristics, various ratios of nicosulfuron plus primisulfuron were tried. Using a half rate of each provided excellent broad spectrum weed control except for only partial control of annual morningglories, moderate control of velvetleaf and poor control of large crabgrass. Other ratios appeared to have little or no advantage. One of the most dramatic observations was the tolerance of sulfonylurea tolerant soybeans to both nicosulfuron and primisulfuron alone or in combination.

Reducing the rate of nicosulfuron from 0.031 lb/A to 0.24 lb/A and comparing X-77 with 28% UAN for nicosulfuron plus bromoxynil indicated little significant difference with all treatments being quite effective. Addition of bromoxynil to nicosulfuron or DPX-79406 significantly improved control of common cocklebur, velvetleaf, annual morningglories, common ragweed, common sunflower and Eastern black nightshade.

Evaluation of V-53482 combinations for stale seedbed soybeans.

All herbicide treatments in this study gave excellent weed control. Perhaps preparing the seedbed early and then applying herbicides later, closer to the time of weed emergence, contributed to the high degree of success.

Evaluation of V-53482 and metolachlor for weed control in soybeans under two soil moisture conditions.

V-53482 gave excellent control of redroot pigweed, common lambsquarters, and Pennsylvania smartweed. Control of velvetleaf, ivyleaf morningglory, and tall morningglory was improved on soils with higher moisture. Metolachlor significantly improved control of giant foxtail but complete control was not achieved.

Evaluation of soil-applied lactofen plus alachlor for weed control in soybeans.

Results of this study indicated activity for soil-applied lactofen with a rate response. All herbicide treatments provided excellent control of redroot pigweed and fair to good control of common lambsquarters with some contribution likely from alachlor. Control of Pennsylvania smartweed was good to excellent with a rate response. Control of velvetleaf was only fair but with some improvement as lactofen rate was increased. Although there was some rate response for lactofen on ivyleaf and tall morningglories, good control was not achieved. Control of giant foxtail was fair to good with a slight contribution attributed to lactofen.

Evaluation of lactofen soil-applied followed by sequential application of lactofen plus clethodim.

Giant foxtail control with clethodim postemergence was excellent and superior to earlier applications of alachlor or metolachlor in other nearby studies. All herbicide treatments gave excellent control of redroot pigweed. Control of common lambsquarters and annual morningglories was poor to fair. Control of Pennsylvania smartweed was good and was best with the higher amount of lactofen applied postemergence. Velvetleaf control was very good and increased with the higher rates applied postemergence. In general, using the higher rates of lactofen postemergence rather than preemergence improved weed control and also caused more temporary effect on the soybeans.

Evaluation of lactofen combinations for weed control in soybeans.

All herbicide treatments gave excellent control of redroot pigweed and Pennsylvania smartweed. Addition of thifensulfuron, imazethapyr, or bentazon to lactofen significantly improved control of common lambsquarters but chlorimuron gave little help. Lactofen plus bentazon or imazethapyr gave excellent control of velvetleaf with thifensulfuron a little less effective and chlorimuron least effective. All treatments gave only poor to fair control of the annual morningglories. In general, imazethapyr or bentazon performed best with lactofen and there was a slight rate response for lactofen. Imazethapyr had the advantage of providing control of grass weeds. Clethodim applied to the entire area on June 12 when giant foxtail was about 8 inches tall provided good control.

Evaluation of clethodim postemergence combinations.

Clethodim provided excellent control of giant foxtail with little or no antagonism from bentazon, chlorimuron or lactofen. Chlorimuron and lactofen provided excellent control of redroot pigweed but bentazon did not. Bentazon provided good control of common lambsquarters but chlorimuron and lactofen did not. Bentazon and lactofen provided better control of velvetleaf than chlorimuron. None of the treatments gave good control of annual morningglories but all gave very good control of Pennsylvania smartweed. One of the most significant observations was control of redroot pigweed by adding lactofen to bentazon.

Effect of imazethapyr on performance of postemergence herbicides for control of grass weeds.

In a previous study an antagonistic effect was noted resulting in decreased grass control when imazethapyr was added to clethodim. In this study, the most antagonism to decrease control of giant foxtail was noted with imazethapyr added to sethoxydim. Fluazifop-P plus fenoxaprop was intermediate and the least was with quizalofop.

Evaluation of quizalofop for early preplant for no-till soybeans.

Quizalofop at all rates provided excellent control of giant foxtail, equivalent to control with sethoxydim applied early preplant. Although

chlorimuron plus thifensulfuron was applied postemergence to all but the check plots, 2,4-D butoxyethyl ester applied early preplant enhanced control of velvetleaf.

Evaluation of clethodim with imazethapyr, lactofen, and chlorimuron plus metribuzin, preplant for no-till soybeans.

Clethodim gave excellent control of giant foxtail at both 0.125 and 0.15 lb/A with no antagonism noted by adding metribuzin and chlorimuron, imazethapyr or lactofen. All treatments gave very good control of velvetleaf. Metribuzin and chlorimuron or imazethapyr gave very good control of common lambsquarters but lactofen did not. This study suggests the feasibility of clethodim plus metribuzin and chlorimuron, imazethapyr or lactofen for early preplant for no-till soybeans. However the addition of a herbicide to improve common lambsquarters control with lactofen is suggested.

Evaluation of herbicide combinations for no-till soybeans.

All herbicide treatments gave excellent control of giant foxtail, velvetleaf and common lambsquarters with no significant effect on soybeans. Clethodim, glyphosate or HOE-39866 appeared to give good burndown of giant foxtail and metolachlor provided residual control. For control of velvetleaf, V53482 or metribuzin appeared to be effective although burndown with only glyphosate also appeared to be adequate. Similarly, control of common lambsquarters was very good.

Weed control for no-till soybeans after corn.

The metribuzin and chlorimuron combination has generally given excellent control of a broad spectrum of broadleaf weeds including weeds such as prickly lettuce and horseweed that are often associated with no-till. If pressure from grass weeds is not very great, the metribuzin and chlorimuron combination may be adequate as indicated in this study. However herbicides such as pendimethalin or metolachlor might be added initially to strengthen grass control. Or metribuzin and chlorimuron can be applied initially and followed by a postemergence application of a herbicide such as quizalofop for control of grass weeds. Observations indicate that the postemergence grass killer should not be applied too early but after most of the grass for the season has emerged. Clethodim has been of special interest since it has provided some residual activity, especially with favorable soil moisture conditions.

With chlorimuron, significant precaution is needed to avoid applying a relatively high rate on soils with pH above 6.8 to avoid carryover effects on crops such as corn the next season. Related studies have included treatments to reduce the chlorimuron rate. Replacing at least part of the chlorimuron with a shorter residual sulfonylurea herbicide such as thifensulfuron may be one possibility or a combination of clomazone with a reduced rate of metribuzin and chlorimuron appears promising.

Another possibility for no-till soybeans is a sequential approach with a herbicide such as glyphosate or sulphosate for early burndown followed by a later postemergence treatment of fluazifop-P and fomesafen.

One of the earliest programs introduced was use of 2,4-D plus sethoxydim for early "burndown" followed by bentazon and acifluorfen and then sethoxydim.

All of the treatments described for this study performed relatively well except in an area of the field with excessive flooding.

Weed control for no-till corn in soybean stubble.

Where corn and soybeans are the predominant crops, one of the most convenient approaches for no-till is to plant corn in soybean stubble. Previous studies have indicated a high degree of success without increasing amount or cost of herbicides. Combinations of atrazine and cyanazine in 1:1 or 1:3 ratios have provided both early burndown and good residual. The availability of nicosulfuron now provides the opportunity for a postemergence follow-up treatment if needed.

A modest rate of glyphosate for early burndown combined with an acetanilide and atrazine has also performed well.

In this study, use of dicamba, bromoxynil or bentazon each in combination with atrazine and followed by nicosulfuron provided excellent control of grass weeds. For early application, dicamba with atrazine appeared to have some advantage over bromoxynil or bentazon for greater residual control of broadleaf weeds.

Time and method of herbicide application for no-till and lo-till.

In this study, corn was planted lo-till after soybeans and no-till after alfalfa or hairy vetch. Soybeans were planted both lo-till and no-till after corn. Tillage was used to prepare a seedbed for alfalfa.

For no-till corn, dicamba with 2,4-D gave good control of alfalfa. Good control of annual weeds was achieved with a preemergence application of cyanazine and atrazine or with a postemergence application of nicosulfuron plus bromoxynil. Dicamba plus atrazine gave excellent control of hairy vetch as well as providing extended control of broadleaf weeds. A postemergence application of nicosulfuron gave good control of grass weeds, including giant foxtail and some quackgrass.

For lo-till corn using two diskings, incorporation of EPTC plus dichlormid and dietholate followed by dicamba and atrazine provided good weed control. Good control was also achieved with metolachlor and atrazine or cyanazine and atrazine followed by nicosulfuron.

For no-till soybeans, pendimethalin plus metribuzin and chlorimuron, glyphosate followed by fluazifop-P and fomesafen, and 2,4-D plus sethoxydim followed by bentazon and acifluorfen and then sethoxydim all performed relatively well.

For lo-till soybeans, incorporation of trifluralin followed by imazethapyr, pendimethalin and imazethapyr surface applied, and metribuzin and chlorimuron followed by quizalofop all performed quite well.

For establishing alfalfa, trifluralin followed by 2,4-DB dimethylamine, sethoxydim plus 2,4-DB, or imazethapyr all aided in establishing on excellent stand of alfalfa. However, imazethapyr had a definite advantage for controlling eastern black nightshade. Imazethapyr also had some advantage over 2,4-DB for control of Pennsylvania smartweed.

In summary, some excellent herbicides are available to provide considerable flexibility for tillage systems and time and method of application. Results suggest that greater acceptance of herbicides for weed control in small seeded legumes could be quite beneficial.

Evaluation of sulfonylurea tolerant soybeans with chlorimuron, thifensulfuron, and imazethapyr.

Although some rates of chlorimuron and thifensulfuron were considered relatively high, effect on soybeans was quite limited. Very little discoloration of soybeans was noted but slight differences in height and in canopy width were noted, with the sulfonylurea tolerant soybeans expressing more tolerance. Unexpectedly, imazethapyr appeared to have greater effect on the sulfonylurea tolerant soybeans than on the others. This suggests some caution in selecting herbicides for use on sulfonylurea tolerant soybeans.

Although the main objective was to compare soybean tolerance, observations on weed control indicated that the quizalofop applied to all plots gave excellent control of giant foxtail but was slightly less effective on yellow foxtail than on giant foxtail. Chlorimuron and imazethapyr were more effective on yellow nutsedge than thifensulfuron. All three herbicides gave excellent control of redroot pigweed and Pennsylvania smartweed. Thifensulfuron and imazethapyr were much more effective on common lambsquarters than chlorimuron. Only imazethapyr controlled eastern black nightshade. Although control of velvetleaf was generally not complete with any of the treatments, control did not fall below 90%.

Effect of time of day for application of sethoxydim.

If photodegradation is important for sethoxydim, then theoretically applications near dusk or after dark may allow more opportunity for uptake by plants and perhaps improved control and the opportunity to use lower rates. A study the previous year tended to support this theory and the study was repeated in 1991. However, the very favorable conditions in 1991 with relatively high temperatures, high humidity, good moisture conditions and very active plant growth appeared to preclude much difference for rate or time of day for application. Sethoxydim gave excellent control of giant foxtail regardless of rate or time of day. Any differences were very minor and difficult to elucidate.

Evaluation of adjuvants for nicosulfuron.

In general, ammonium sulfate and 28% urea ammonium nitrate solution each enhanced herbicide performance to about the same degree and appeared to be comparable. The methylated seed oil (Scoil) appeared to be most effective, with crop oil concentrate (an 83% parafin base petroleum oil) intermediate, and X-77 (a nonionic surfactant from Valent) slightly less effective for control of giant foxtail. For primisulfuron, the methylated seed oil appeared to be more effective than crop oil concentrate plus 28% UAN. For imazethapyr, X-77 plus 28% UAN and methylated seed oil were about equally effective for weed control but the methylated seed oil with imazethapyr appeared to have a little less effect on corn.

Evaluation of nicosulfuron in combination with herbicides for broadleaf weed control in corn.

There was little evidence of corn injury when 2,4-D, dicamba, atrazine, pyridate, bromoxynil, thifensulfuron or V-23031 were combined with nicosulfuron. However, combinations with cyanazine or bentazon had significant effect on corn. There appeared to be little conclusive evidence of antagonism and decreased control due to mixing other herbicides with nicosulfuron. Most combinations improved spectrum of weed control. Although control of giant foxtail with DPX-79406 was good, it appeared to be less effective than nicosulfuron on some broadleaf weeds. A combination of nicosulfuron and thifensulfuron showed promise for good weed control and good corn tolerance.

APPENDIX

NORTHERN ILLINOIS AGRONOMY RESEARCH CENTER - DEKALB
APRIL, 1991

Date	Mean Wind Speed mph	Mean Wind Direction degrees	Air Temp F			Max Rel Hum %	Min Rel Hum %	Total Precip inches	Soil Temp F 4" under sod	
			Max	Min	Mean				Max	Min
1	7	311	53	33	42	88	18	T	46	39
2	12	126	56	31	44	85	19		45	38
3	14	126	67	39	53	63	23		47	40
4	8	166	58	47	53	100	63	.15	48	44
5	7	214	75	45	61	100	35		53	44
6	14	210	82	53	67	91	19		56	49
7	11	201	79	54	67	87	41		58	51
8	10	192	77	61	67	96	45	.85	60	55
9	11	315	61	39	48	100	86	.34	58	50
10	11	325	55	35	44	93	23	.01	53	47
11	12	71	46	36	41	86	41		50	50
12	17	96	52	40	45	83	47	.10	46	43
13	14	77	51	43	47	95	68	T	47	44
14	13	213	65	48	55	100	71	.89	52	45
15	15	278	64	45	52	94	41	.55	53	47
16	8	276	59	46	52	89	48	.01	54	48
17	10	51	62	41	51	87	30		55	48
18	14	75	60	40	50	88	43	.01	52	48
19	19	44	57	41	50	82	44		51	47
20	13	26	55	37	46	82	41		50	45
21	9	23	59	40	48	77	22	T	52	46
22	8	250	61	36	51	78	22		53	45
23	11	261	57	40	48	90	35	.14	51	47
24	7	332	65	37	51	91	12		54	45
25	7	169	66	42	55	74	25		53	47
26	11	123	77	44	62	87	27		56	48
27	13	159	73	57	65	100	56	.12	58	53
28	10	107	76	49	65	100	37		60	53
29	18	174	74	51	64	95	49	.45	60	57
30	21	239	63	48	55	80	36		58	54

NORTHERN ILLINOIS AGRONOMY RESEARCH CENTER - DEKALB
MAY, 1991

Date	Mean Wind Speed mph	Mean Wind Direction degrees	Air Temp F			Max Rel Hum %	Min Rel Hum %	Total Precip inches	Soil Temp F 4" under sod	
			Max	Min	Mean				Max	Min
1	14	266	58	43	52	84	34	.02	56	52
2	11	281	70	40	54	84	18		56	49
3	14	86	59	42	50	83	32		53	50
4	12	79	65	47	57	78	51		55	49
5	16	184	68	44	54	99	63	.81	55	51
6	18	251	50	43	46	87	57		54	49
7	10	258	65	41	54	88	24	T	54	47
8	10	103	70	49	58	92	56		55	50
9	8	148	77	52	65	96	34		58	52
10	9	123	77	53	67	91	51		59	54
11	7	176	85	60	73	94	35		63	56
12	6	164	84	62	74	100	35		65	59
13	6	224	87	64	77	91	33		66	61
14	7	167	85	65	73	88	29	.03	66	62
15	7	163	84	61	73	93	41		66	61
16	4	231	73	65	69	96	66	1.02	65	62
17	15	62	73	50	60	99	79	.66	65	61
18	16	70	54	47	51	94	77		62	58
19	12	56	63	49	56	89	52		61	57
20	8	98	77	51	65	89	35		63	57
21	8	154	84	59	71	100	42	.13	64	60
22	8	188	83	68	74	100	52	.03	67	62
23	11	190	84	69	74	97	42	T	70	64
24	10	228	85	68	75	100	36	.57	73	66
25	8	129	76	67	70	100	84	3.35	70	67
26	14	210	80	68	73	96	58		72	67
27	8	220	86	64	76	100	46		75	66
28	10	207	90	68	80	100	30		77	69
29	8	183	85	69	76	97	50	.01	75	70
30	12	218	89	67	76	94	43	.49	76	69
31	8	212	84	67	73	96	64	.51	75	69

NORTHERN ILLINOIS AGRONOMY RESEARCH CENTER - DEKALB
JUNE, 1991

Date	Mean Wind Speed mph	Mean Wind Direction degrees	Air Temp F			Max Rel Hum %	Min Rel Hum %	Total Precip inches	Soil Temp F 4" under sod	
			Max	Min	Mean				Max	Min
1	4	188	87	67	75	96	41	.23	77	69
2	62	8	84	67	75	95	50		77	71
3	9	56	81	62	71	95	41		76	71
4	15	78	71	57	64	74	28		72	67
5	11	73	73	53	64	90	29		71	65
6	7	71	76	53	66	85	20		71	63
7	4	114	80	54	69	78	21		71	63
8	4	165	82	57	71	86	23		74	64
9	8	195	83	60	73	81	25		73	66
10	11	230	83	68	75	94	30	.05	73	67
11	5	256	80	63	71	96	38	.42	75	68
12	6	126	84	64	72	93	48	.07	76	68
13	8	145	87	62	75	92	38	.01	76	68
14	13	190	89	69	80	94	48	T	77	71
15	9	233	83	69	75	89	55		75	71
16	7	6	80	60	71	93	27	T	75	70
17	4	103	83	57	70	92	25		75	67
18	3	65	85	56	73	90	27		75	66
19	5	54	86	60	75	93	35	T	75	68
20	4	146	88	60	75	93	33	T	76	67
21	5	106	88	63	76	94	30	.23	76	69
22	13	46	66	60	62	95	83		73	66
23	10	74	76	59	67	86	25		70	65
24	5	108	81	57	69	93	35	T	72	65
25	4	131	85	57	72	89	33	T	74	65
26	10	189	87	61	77	91	51	.01	75	67
27	10	198	87	67	78	93	51	T	77	70
28	8	208	85	65	76	93	44	.01	76	70
29	7	213	89	68	79	94	45	.01	78	70
30	6	115	88	68	78	96	61	1.57	80	71

NORTHERN ILLINOIS AGRONOMY RESEARCH CENTER - DEKALB
JULY, 1991

Date	Mean Wind Speed mph	Mean Wind Direction degrees	Air Temp F			Max Rel Hum %	Min Rel Hum %	Total Precip inches	Soil Temp F 4" under sod	
			Max	Min	Mean				Max	Min
1	6	215	88	68	78	97	59		79	73
2	6	243	87	69	78	94	34	T	80	74
3	6	255	83	66	74	94	44	.59	78	73
4	7	244	79	63	70	94	48	T	77	72
5	5	238	84	63	74	94	46		78	71
6	7	211	88	67	78	95	53	T	78	72
7	7	223	88	70	77	96	57	.03	79	73
8	6	16	79	64	71	94	42	T	78	73
9	6	161	75	60	68	95	50		76	72
10	4	86	83	57	70	96	40	T	77	69
11	6	130	83	59	73	95	49		76	70
12	6	261	84	65	75	96	47	T	76	72
13	6	12	77	61	68	96	52	.03	74	70
14	5	19	78	57	68	96	28	T	75	68
15	3	185	82	52	69	94	29		75	67
16	6	205	84	56	72	94	38	T	76	68
17	6	223	84	65	75	94	47		76	70
18	5	215	88	66	77	94	43	T	78	71
19	7	209	92	65	79	94	38		79	71
20	8	190	89	70	80	94	45		79	73
21	6	172	87	72	79	94	62	.02	78	73
22	8	229	93	73	81	96	42	.08	80	73
23	7	335	82	61	74	95	28		79	73
24	5	251	79	57	69	93	36		76	70
25	6	15	75	54	65	93	34		75	68
26	4	17	76	51	65	95	31		75	66
27	5	66	77	49	65	94	30		74	65
28	5	118	80	58	69	93	37	.02	73	67
29	7	354	76	56	68	95	46		73	68
30	4	306	79	53	66	95	34		74	65
31	9	222	84	56	72	94	45		74	66

PERRY ORR
AGRICULTURE RESEARCH AND DEMONSTRATION CENTER
APRIL 1991

Date	Wind Speed mph.	Wind Dir.	Air Temp F		Humidity %		Soil Temp F 4" bare Soil		Total Precip inches
			Max.	Min.	Max.	Min.	Max.	Min.	
1	2	NW	61	33	100	26	49	44	—
2	10	E	67	37	85	24	54	45	—
3	5	E	63	44	78	44	52	47	—
4	3	W	73	50	100	40	53	48	.10
5	7	W	66	41	100	78	55	51	—
6	7	SW	78	50	96	36	58	50	—
7	8	S	83	57	100	32	60	52	—
8	3	SE	79	57	100	64	61	56	.10
9	10	W	80	45	100	56	64	57	.05
10	8	NW	59	35	100	40	60	52	—
11	12	SE	57	35	96	28	58	51	—
12	15	SE	50	42	96	60	52	49	.05
13	4	E	55	46	100	64	51	49	.40
14	5	S	69	49	100	100	56	50	1.08
15	5	W	65	43	100	81	60	55	1.00
16	1	NW	68	39	100	40	60	54	—
17	4	NE	80	45	100	30	62	54	—
18	12	E	71	45	100	56	62	52	—
19	3	N	65	44	100	70	58	56	.19
20	5	N	52	41	100	88	56	53	.33
21	1	NW	52	34	100	72	54	50	.28
22	4	NW	58	33	100	40	57	49	—
23	6	SW	62	43	100	34	57	51	—
24	6	NW	63	35	100	48	56	51	—
25	0	S	67	40	100	28	59	50	—
26	4	SE	60	36	100	60	56	52	—
27	4	S	78	46	100	66	60	52	.31
28	1	N	74	48	100	100	68	58	.13
29	8	SE	77	51	100	84	65	58	.01
30	8	SW	78	46	100	38	66	59	—

PERRY - ORR
AGRICULTURE RESEARCH AND DEMONSTRATION CENTER
MAY 1991

Date	Wind Speed mph.	Wind Dir.	Air Temp F		Humidity %		Soil Temp F 4" bare Soil		Total Precip inches
			Max.	Min.	Max.	Min.	Max.	Min.	
1	8	W	70	42	100	42	62	57	.54
2	3	W	64	47	82	34	62	56	--
3	7	E	78	46	100	30	65	55	--
4	3	E	57	45	100	88	59	57	1.58
5	2	SW	66	50	100	100	61	56	3.73
6	7	W	69	41	100	72	61	55	.01
7	3	SW	56	35	100	56	55	52	.01
8	4	SE	76	42	100	44	61	51	.01
9	2	E	76	47	100	44	63	56	--
10	2	E	70	54	100	88	63	59	—
11	1	SE	75	60	100	100	65	60	--
12	1	NE	81	55	100	66	69	62	--
13	4	SW	84	62	100	54	72	64	--
14	6	SW	86	62	100	76	74	67	--
15	4	NE	85	62	100	44	74	69	.23
16	1	E	85	62	100	70	73	69	.10
17	4	S	76	58	100	80	71	69	.29
18	6	SE	88	58	100	70	75	67	1.82
19	3	E	79	55	100	92	73	68	1.07
20	1	NE	63	52	100	100	70	66	--
21	8	SE	79	57	100	76	72	65	--
22	2	E	82	64	100	72	74	68	.01
23	5	S	81	65	100	86	73	70	.25
24	2	SW	84	66	100	60	76	69	.02
25	3	SW	86	65	100	72	78	71	1.53
26	9	SW	79	66	100	100	76	71	.45
27	12	SW	85	63	100	84	78	71	.01
28	4	S	87	64	100	76	80	72	--
29	2	E	91	67	100	70	82	74	--
30	7	S	84	62	100	100	79	74	2.48
31	7	SW	87	65	100	88	80	73	.05

PERRY - ORR
AGRICULTURE RESEARCH AND DEMONSTRATION CENTER
JUNE 1991

Date	Wind Speed mph.	Wind Dir.	Air Temp F		Humidity %		Soil Temp F 4" bare Soil		Total Precip inches
			Max.	Min.	Max.	Min.	Max.	Min.	
1	4	NW	89	65	100	90	83	75	.22
2	5	W	90	64	100	68	83	74	--
3	5	W	87	65	100	76	88	75	--
4	7	E	91	64	100	60	86	76	--
5	7	NE	80	58	100	64	79	72	--
6	4	E	78	50	100	50	78	71	--
7	1	NW	78	49	100	42	77	70	--
8	1	SE	80	51	100	46	78	69	--
9	2	SE	82	55	100	52	79	70	--
10	3	SW	88	64	100	56	80	71	—
11	6	SW	83	62	100	60	79	74	--
12	4	SW	85	63	100	76	80	72	--
13	3	SE	89	62	100	66	82	73	--
14	6	SE	90	67	100	72	81	75	--
15	8	SW	92	71	100	72	84	75	--
16	6	N	90	64	100	88	82	75	.48
17	3	SE	83	54	100	64	82	74	--
18	1	N	85	53	100	50	84	73	--
19	3	N	86	58	100	54	84	73	—
20	5	SE	88	58	100	56	84	75	--
21	3	SE	90	66	100	54	85	75	--
22	4	NW	90	67	100	70	84	78	--
23	2	NE	79	59	100	96	80	75	.14
24	3	E	77	60	100	96	78	74	--
25	2	SE	82	61	100	80	80	72	--
26	4	S	87	65	100	74	82	74	--
27	10	S	91	66	100	80	83	75	--
28	5	SW	89	61	100	66	85	76	--
29	8	S	89	66	100	64	84	75	--
30	8	NW	94	72	100	66	87	77	--

PERRY - ORR
AGRICULTURE RESEARCH AND DEMONSTRATION CENTER
July 1991

Date	Wind Speed mph.	Wind Dir.	Air Temp F		Humidity %		Soil Temp F 4" bare Soil		Total Precip inches
			Max.	Min.	Max.	Min.	Max.	Min.	
1	12	SW	95	72	100	57	89	78	--
2	3	SW	94	68	82	68	88	80	.13
3	5	NW	91	63	100	62	87	78	.04
4	1	W	90	61	100	44	84	76	--
5	5	SE	86	63	100	52	84	76	--
6	10	SW	94	71	100	54	86	76	--
7	15	SW	97	75	100	50	88	78	--
8	5	NW	96	69	100	70	89	80	--
9	5	NE	88	62	100	56	88	79	.36
10	2	SW	79	59	100	94	80	75	1.15
11	12	S	78	66	100	100	80	74	1.27
12	12	NW	80	66	100	100	79	74	.68
13	10	NW	89	63	100	66	83	74	--
14	3	E	81	59	100	88	81	75	--
15	2	SE	83	56	100	70	82	75	--
16	2	SE	85	56	100	54	84	74	--
17	2	SE	87	57	100	54	84	74	--
18	2	E	90	58	100	58	85	75	--
19	3	S	92	66	100	50	96	76	—
20	5	E	91	66	100	80	96	78	--
21	10	SW	91	73	100	86	85	78	--
22	10	S	95	74	100	72	87	70	--
23	8	N	94	69	100	70	88	80	.01
24	2	NW	84	59	100	58	86	78	.02
25	6	NW	77	55	100	46	80	74	.01
26	3	NE	81	49	100	50	83	73	--
27	3	E	80	49	100	54	82	73	--
28	4	SE	81	57	100	56	81	72	--
29	14	NW	85	63	100	58	82	73	--
30	1	NW	78	50	100	68	78	71	--
31	8	SW	84	54	100	54	83	71	--

NORTHWESTERN ILLINOIS AGRICULTURAL RESEARCH AND DEMONSTRATION CENTER - MONMOUTH
APRIL, 1991

Date	Air Temperature °F		Relative Humdity %		Soil Temperature-4"				Precipitation	Growing Degree Days
					Bare		Sod			
	Max	Min	Max	Min	Max	Min	Max	Min	Inches	
1	56	32	93	20	53	39	46	40	--	3.0
2	58	36	65	13	58	39	50	40	--	4.0
3	60	40	65	26	56	42	47	43	--	5.0
4	69	49	100	30	59	46	51	44	0.06	9.5
5	59	46	100	68	55	49	51	49	TR	9.5
6	77	54	78	23	65	49	56	49	--	15.5
7	80	53	94	21	70	53	59	52	--	16.5
8	79	60	98	36	68	55	59	54	TR	19.5
9	79	44	97	36	71	57	61	57	0.11	14.5
10	44	34	95	56	57	42	57	47	TR	--
11	55	34	70	17	62	43	54	47	--	2.5
12	48	41	65	30	47	44	48	45	0.01	--
13	57	42	94	36	50	44	47	45	TR	3.5
14	56	48	100	85	51	48	50	47	1.16	3.0
15	59	43	100	57	60	48	54	50	0.62	4.5
16	65	41	95	33	59	47	54	49	--	7.5
17	71	45	99	37	66	47	57	49	0.05	10.5
18	65	44	77	37	65	49	57	51	--	7.5
19	62	44	100	55	58	48	54	50	0.27	6.0
20	51	40	100	55	49	45	50	48	0.35	0.5
21	53	36	95	55	56	42	52	46	--	1.5
22	57	36	100	32	59	42	59	46	--	3.5
23	62	43	100	30	62	42	53	47	0.04	6.0
24	57	37	96	34	59	44	62	46	--	3.5
25	66	44	82	20	68	44	57	46	--	8.0
26	62	45	98	37	58	48	52	50	--	6.0
27	77	52	100	41	69	48	57	49	0.19	14.5
28	73	49	90	38	67	53	60	54	--	11.5
29	75	58	99	46	66	53	59	54	0.01	16.5
30	78	48	92	21	72	53	61	54	--	14.0

NORTHWESTERN ILLINOIS AGRICULTURAL RESEARCH AND DEMONSTRATION CENTER - MONMOUTH
MAY, 1991

Date	Air Temperature °F		Relative Humdity %		Soil Temperature-4"				Precipitation	Growing Degree Days
					Bare		Sod			
	Max	Min	Max	Min	Max	Min	Max	Min	Inches	
1	67	47	73	28	69	53	57	54	--	8.5
2	61	40	92	26	67	49	56	51	--	5.5
3	73	45	76	23	72	50	58	51	--	11.5
4	55	45	98	57	53	52	53	52	0.31	2.5
5	66	51	100	63	62	52	56	52	0.94	8.5
6	67	42	100	65	62	47	57	51	TR	8.5
7	49	39	97	46	49	43	56	49	--	--
8	68	45	98	42	66	43	57	48	--	9.0
9	71	51	99	43	62	54	57	48	--	11.0
10	74	55	98	44	74	54	61	55	--	14.5
11	77	62	97	58	71	58	62	57	--	19.5
12	81	62	97	46	79	63	66	60	--	21.5
13	83	66	97	60	79	65	67	62	--	24.5
14	87	64	95	45	84	67	70	64	--	25.0
15	87	66	98	29	86	68	71	65	0.17	26.0
16	82	65	98	48	79	68	71	65	0.02	23.5
17	72	61	99	79	72	64	68	65	0.20	16.5
18	83	58	100	57	79	64	71	65	0.62	20.5
19	69	51	100	86	64	57	65	61	--	10.0
20	66	52	86	66	67	57	65	61	--	9.0
21	76	58	97	57	74	60	67	62	--	17.0
22	80	67	98	62	76	66	69	65	0.09	23.5
23	83	69	98	50	81	68	72	67	--	26.0
24	81	67	100	50	80	69	72	69	0.43	24.0
25	83	67	98	44	82	69	75	68	0.61	25.0
26	75	68	98	85	84	69	72	70	0.32	21.5
27	81	66	99	46	78	69	74	69	--	23.5
28	87	71	97	42	87	70	76	69	--	28.5
29	90	77	98	40	90	73	78	71	--	31.5
30	84	66	100	48	84	71	75	72	0.25	25.0
31	87	67	98	54	82	71	76	71	--	26.5

NORTHWESTERN ILLINOIS AGRICULTURAL RESEARCH AND DEMONSTRATION CENTER - MONMOUTH
JUNE, 1991

Date	Air Temperature °F		Relative Humdity %		Soil Temperature-4"				Precipitation	Growing Degree Days
					Bare		Sod			
	Max	Min	Max	Min	Max	Min	Max	Min	Inches	
1	89	66	100	47	89	71	78	72	26.0	
2	87	70	98	36	85	71	83	72	--	28.0
3	87	70	99	42	87	73	81	74	--	28.0
4	86	62	90	44	91	72	82	73	--	24.0
5	72	53	100	35	76	65	73	68	0.01	12.5
6	75	52	98	28	83	65	74	67	--	13.5
7	77	57	73	28	83	65	73	66	--	17.0
8	80	56	93	28	85	66	74	67	--	18.0
9	82	60	94	26	86	67	74	67	--	21.0
10	86	66	100	34	86	69	76	68	--	26.0
11	83	67	99	35	82	71	73	70	0.15	25.0
12	84	65	98	34	86	72	78	70	--	24.5
13	89	66	97	28	91	72	81	72	--	26.0
14	88	71	98	42	89	74	79	73	--	28.5
15	91	72	96	46	91	75	79	73	TR	29.0
16	85	63	99	52	85	72	78	73	TR	24.0
17	81	56	100	30	88	70	80	70	--	18.5
18	83	57	96	28	89	70	80	70	--	20.0
19	85	61	99	29	90	70	82	70	--	23.0
20	88	60	100	31	89	72	81	71	--	23.0
21	89	66	99	34	92	73	82	72	--	26.0
22	82	63	98	42	89	73	83	71	0.24	24.5
23	67	60	98	83	73	67	73	68	TR	13.5
24	76	62	94	53	76	66	73	68	--	19.0
25	81	64	95	44	83	69	77	68	--	12.5
26	84	68	96	39	88	70	80	70	--	26.0
27	88	72	96	53	90	74	81	73	--	29.0
28	87	65	97	50	91	75	83	74	--	25.5
29	86	69	96	35	92	75	83	74	--	27.5
30	92	72	96	39	93	76	85	75	--	29.0

NORTHWESTERN ILLINOIS AGRICULTURAL RESEARCH AND DEMONSTRATION CENTER - MONMOUTH
JULY, 1991

Date	Air Temperature °F		Relative Humdity %		Soil Temperature-4"				Precipitation	Growing Degree Days
					Bare		Sod			
	Max	Min	Max	Min	Max	Min	Max	Min	Inches	
1	91	73	92	44	95	80	87	77	--	29.5
2	93	66	98	34	95	79	88	78	--	26.0
3	91	63	98	25	95	76	87	77	0.01	24.5
4	89	59	98	25	92	75	84	75	--	22.5
5	83	62	95	33	88	74	83	74	TR	22.5
6	92	69	96	27	96	75	87	74	TR	27.5
7	94	72	92	36	92	77	84	77	TR	29.0
8	93	67	94	38	91	77	85	77	--	26.5
9	82	65	100	32	93	77	88	77	0.01	23.5
10	67	63	99	88	77	71	77	72	0.44	15.0
11	82	66	98	46	83	71	80	72	0.08	24.0
12	80	70	97	62	79	74	77	74	0.03	25.0
13	88	63	97	32	89	72	84	75	--	24.5
14	81	58	98	40	87	71	83	73	--	19.5
15	82	61	99	35	88	71	85	72	--	21.5
16	83	58	96	31	90	73	83	73	--	20.5
17	85	64	91	31	92	73	85	73	--	24.5
18	90	64	98	34	94	74	86	74	--	25.0
19	90	67	98	26	94	77	87	76	--	26.5
20	92	69	98	26	95	78	87	77	--	27.5
21	91	75	92	45	94	79	88	77	--	30.5
22	94	76	89	40	96	79	88	79	--	31.0
23	94	69	100	40	96	75	89	76	3.49	27.5
24	83	61	97	25	82	71	83	74	--	22.0
25	78	57	98	28	80	68	79	72	--	17.5
26	78	55	98	28	79	68	79	71	--	16.5
27	77	56	98	30	82	69	79	71	--	16.5
28	78	61	89	32	81	69	78	71	--	19.5
29	81	64	99	45	81	71	77	72	0.13	22.5
30	74	53	97	40	75	66	76	69	--	13.5
31	81	61	98	35	82	66	78	69	--	21.0

HERBICIDE TERMINOLOGY

Common Name or Code Name	Trade Name	Company
Acetochlor & safener	ICIA-5676	ICI
Acifluorfen	Blazer	BASF
Alachlor	Lasso	Monsanto
Alachlor WDG	Partner	Monsanto
Alachlor & atrazine	Lariat	Monsanto
Alachlor & trifluralin	Cannon	Monsanto
Alachlor MT & atrazine	Bullet	Monsanto
Atrazine	AAtrex	CIBA-Geigy
Atrazine & 2,4-D	Shotgun	United Agri Products
Bentazon	Basagran	BASF
Bentazon & acifluorfen	Galaxy, Storm	BASF
Bentazon & atrazine	Laddok	BASF
Bromoxynil	Buctril	Rhone-Poulenc
Butylate & atrazine	Sutazine	ICI
Butylate & dichlormid	Sutan+	ICI
Chloramben	Amiben	Rhone-Poulenc
Chlorimuron	Classic	DuPont
CGA-180937	Metolachlor & CGA-154281	CIBA-Geigy
CGA-136872	Beacon	CIBA-Geigy
CL-23601	-----	Agrolinz
Clethodim	Select	Valent
Clomazone	Command	FMC
Clomazone & trifluralin	Commence	DowElanco,FMC
Clopyralid(XRM-3972)	Stinger	DowElanco
Clopyralid & 2,4-D	Curtail	DowElanco
Cyanazine	Bladex	DuPont
Cyanazine & atrazine 3:1	Extrazine II	DuPont
2,4-D butoxyethyl ester	Weedone LV4	Rhone-Poulenc
2,4-D dimethylamine salt	Savage	United Agri Products
2,4-DB dimethyl amine	Butyrac 200	Rhone-Poulenc
DE-498	-----	DowElanco
Dicamba	Banvel	Sandoz
Dicamba & atrazine	Marksman	Sandoz
Diquat	Diquat	Valent
DPX-79406	nicosulfuron & DPXE9636	DuPont
EPTC	Eptam	ICI
EPTC & dichlormid	Eradicane	ICI
EPTC & dichlormid & diethotate	Eradicane Extra	ICI
Ethalfluralin	Sonalan	DowElanco
F-80 (naphthalic anhydride)	Advantage	FMC
Fenoxaprop	Option	Hoechst-Roussel
Fluazifop-P	Fusilade 2000	ICI
Fluazifop-P & fomesafen	Tornado	ICI
Fluazifop-P & fenoxaprop	Fusion	ICI
Fluroxypyr(EF-689)	Starane	DowElanco
Fomesafen	Reflex	ICI
Glufosinate (HOE-39866)	Ignite	Hoechst-Roussel
Glyphosate	Roundup	Monsanto
Glyphosate & alachlor	Bronco	Monsanto
Haloxyfop	Verdict	DowElanco

HERBICIDE TERMINOLOGY

Common Name or Code Name	Trade Name	Company
HOE-39866	Ignite	Hoechst-Roussel
Imazaquin	Scepter	American Cyanamid
Imazaquin & pendimethalin	Squadron	American Cyanamid
Imazethapyr	Pursuit	American Cyanamid
Imazethapyr & pendimethalin	Pursuit Plus	American Cyanamid
Imazethapry & trifluralin	Passport	American Cyanamid
Lactofen	Cobra	Valent
Linuron & chlorimuron	Lorox Plus	DuPont
Metolachlor & atrazine	Bicep	CIBA-Geigy
Metolachlor & CGA-154281	Dual & safener	CIBA-Geigy
Metribuzin	Lexone, Sencor	DuPont, Mobay
Metribuzin & chlorimuron	Preview, Canopy	DuPont
Metribuzin & trifluralin	Salute	Mobay
Metribuzin & metolachlor	Turbo	Mobay
MON-8421 (Acetachlor)	-----	Monsanto
MON-13280	-----	Monsanto
Nicosulfuron	Accent	DuPont
Paraquat	Gramoxone Super	ICI
Pendimethalin	Prowl	American Cyanamid
Primisulfuron	Beacon	CIBA-Geigy
Pyridate	Tough	Agrolinz
Quizalofop	Assure	DuPont
Quizalofop D+ isomer	Assure II	DuPont
Sethoxydim	Poast	BASF
Sethoxydim & adjuvant	Poast Plus	BASF
Sulphosate	Touchdown	ICI
Thifensulfuron methyl	Pinnacle	DuPont
Trifluralin	Treflan	DowElanco
Trifluralin 80DF (GX-217)	Trilin GRP	Griffin
Trifluralin 60DF	Trific	Terra
Trifluralin & clomazone	Commence	Elanco,FMC
Triclopyr	Garlon	DowElanco
Triclopyr & 2,4-D ester (XRM-4715)	Crossbow	DowElanco
Tridiphane	Tandem	DowElanco
UAP-112	-----	United Agri Products
UAP-105	-----	United Agri Products
V-23031	-----	Valent
V-53482	-----	Valent

TRADE NAMES OF HERBICIDES

Trade Name	Common Name(s)	Company
AAtrex	Atrazine	CIBA-Geigy
Accent	Nicosulfuron (DPX-V9360)	DuPont
Amiben	Chloramben	Rhone-Poulenc
Assure	Quizalofop	DuPont
Assure II	Quizalofop D+ isomer	DuPont
Banvel	Dicamba	Sandoz
Beacon	Primisulfuron (CGA-136872)	CIBA-Geigy
Bladex	Cyanazine	DuPont
Blazer	Acifluorfen	BASF
Brominal	Bromoxynil	Rhone-Poulenc
Bronco	Glyphosate & alachlor	Monsanto
Buctril	Bromoxynil	Rhone-Poulenc
Bullet	Alachlor MT & atrazine	Monsanto
Butyrac 200	2,4-DB dimethyl amine	Rhone-Poulenc
Canopy	Metribuzin & chlorimuron 6:1	DuPont
Classic	Chlorimuron	DuPont
Cobra	Lactofen	Valent
Command	Clomazone	FMC
Commence	Clomazone & trifluralin	FMC,DowElanco
Crossbow	Triclopyr & 2,4-D	DowElanco
Curtail	Clopyralid & 2,4-D	DowElanco
Dual	Metolachlor	CIBA-Geigy
Eptam	EPTC	ICI
Eradicane	EPTC & dichlormid	ICI
Eradicane Extra	EPTC & dichlormid & dietholate	ICI
Extrazine II	Cyanazine & atrazine 3:1	DuPont
Fusilade 2000	Fluazifop-P	ICI
Fusion	Fluazifop-P & fenoxaprop	ICI
Galaxy	Bentazon & acifluorfen	BASF
Gramoxone Extra	Paraquat	ICI
Ignite	HOE-39866	Hoechst-Roussel
Laddok	Bentazon & atrazine	BASF
Lariat	Alachlor & atrazine	Monsanto
Lasso	Alachlor	Monsanto
Lexone	Metribuzin	DuPont
Linex	Linuron	Griffin
Lontrel	Clopyralid	DowElanco
Lorox	Linuron	DuPont
Marksman	Dicamba & atrazine	Sandoz
Option	Fenoxaprop	Hoechst-Roussel
Partner	Alachlor 65 WDG	Monsanto
Passport	Imazethapyr & trifluralin	American Cyanamid
Pinnacle	Thifensulfuron methyl	DuPont
Poast	Sethoxydim	BASF
Poast Plus	Sethoxydim & adjuvant	BASF
Preview	Metribuzin & chlorimuron 10:1	DuPont
Prowl	Pendimethalin	American Cyanamid

TRADE NAMES OF HERBICIDES

Trade Name	Common Name(s)	Company
Pursuit	Imazethapyr	American Cyanamid
Pursuit Plus	Pendimethalin & imazethapyr	American Cyanamid
Reflex	Fomesafen	ICI
Roundup	Glyphosate	Monsanto
Salute	Metribuzin & trifluralin	Mobay
Savage	2,4-D dimethylamine salt	United Agri Products
Scepter	Imazaquin	American Cyanamid
Select	Clethodim	Valent
Sencor	Metribuzin	Mobay
Shotgun	Atrazine & 2,4-D	United Agri Products
Sonalan	Ethalfluralin	DowElanco
Squadron	Imazaquin & pendimethalin	American Cyanamid
Stinger	Clopyralid	DowElanco
Storm	Bentazon & acifluorfen	BASF
Sutan+	Butylate & dichlormid	ICI
Tandem	Tridiphane	DowElanco
Tornado	Fluazifop-P & fomesafen	ICI
Touchdown	Sulphosate	ICI
Tough	Pyridate	Agrolinz
Trific	Trifluralin 60DF	Terra
Tri-Scept	Imazaquin & trifluralin	American Cyanamid
Treflan	Trifluralin	DowElanco
Turbo	Metribuzin & alachlor	Mobay
Verdict	Haloxyfop	DowElanco

Note: Package mix products (consisting of 2 or more active ingredients blended by the manufacturer into one product) are identified with an "&" symbol between the common names of the active ingredients.

Abbreviations for Herbicide Common Names

The abbreviations listed below have been established by the NCWCC for common names of herbicides, herbicide antidotes, and other herbicide-modifying chemicals for which common names have been assigned. Abbreviations only should be used in tables and figures to save space. Authors are encouraged to spell common names wherever possible and use the full name of each herbicide at least once in each table. When abbreviations are used, they must either conform to this NCWCC approved list or they must be footnoted.

Common Name	Abbre-viation	Common Name	Abbre-viation	Common Name	Abbre-viation
Acetochlor	Acet	Dinoseb	Dino	Metsulfuron	Mets
Acifluorfen	Acif	Diphenamid	Diph	Molinate	Moli
Alachlor	Alac	Dithiopyr	Dith	MSMA	MSMA
Ametryn	Amet	Diquat	Diqu	Naphthalic anhydride	NA
Amitrole	Amit	Diuron	Diur	Napropamide	Napr
Atrazine	Atra	DSMA	DSMA	Naptalam	Napt
Barban	Barb	Endothall	Endo	Nicosulfuron	Nico
Benefin	Bnfn	EPTC	EPTC	Nitrofen	Nifn
Benazolin	Bena	Ethalfluralin	Etha	Norflurazon	Norf
Bentazon	Bent	Ethamesulfuron	Emsu	Oryzaline	Oryz
Benzofluor	Befl	Fenoxaprop	Fenx	Oxadiazon	Oxad
Benzolyprop	Bepr	Flamprop	Flam	Oxyfluorfen	Oxyf
Bifenox	Bife	Fluazifop	Flfp	Paraquat	Para
Bromacil	Brcl	Fluazifop-P	Flfp-P	Pendimethalin	Pend
Bromoxynil	Brox	Fluorochloridone	Flcd	Perfluidone	Perf
Butylate	Buty	Flurazole	Flzl	Phenmedipham	Phen
Cacodylic acid	Caco	Flurtamone	Flmn	Picloram	Picl
Chloramben	Clam	Fluroxypyr	Flox	Primisulfuron	Prim
Chlorimuron	Clim	Fomesafen	Fome	Prometryn	Prtr
Chloroxuron	Clxu	Glufosinate	Gluf	Pronamid	Pron
Chlorsulfuron	Clsu	Glyphosate	Glyt	Propachlor	Prcl
Cinmethylin	Cinm	Halosafen	Halo	Propanil	Prnl
Clethodim	Clet	Haloxyfop	Halx	Propazine	Przn
Clomazone	Clom	Hexazinone	Heaz	Pyrazon	Pyzn
Cloproxydim	Clpx	Imazamethabenz	Immb	Pyridate	Pydt
Clopyralid	Clpy	Imazapyr	Impr	Quinclorac	Qucl
Cyanazine	Cyan	Imazaquin	Imqn	Quizalofop	Qufp
Cycloate	Cycl	Imazethapyr	Imep	Sethoxydim	Seth
Cyometrinil	Cyom	Isouron	Isur	Siduron	Sidu
2,4-D	2,4-D	Isoxaben	Isox	Simazine	Sima
Dalapon	Dala	Lactofen	Lact	Sulfometuron	Sume
2,4-DB	2,4-DB	Linuron	Linu	Tebuthiuron	Tebu
Desmedipham	Desm	MAA	MAA	Terbacil	Tecl
Diallate	Dial	MAMA	MAMA	Thifensulfuron	Thif
Dicamba	Dica	MCPA	MCPA	Terbutryn	Tert
Dichlobenil	Dibl	MCPB	MCPB	Triallate	Tria
Dichlormid	Dcmd	Mecoprop	Meco	Tribenuron	Trib
Diclofop	Dcfp	Mefluidide	Mefl	Triclopyr	Trcp
Diethatyl	Dtyl	Methazole	Mezl	Tridiphane	Trid
Dietholate	Dlat	Metolachlor	Meto	Trifluralin	Trif
Difenzoquat	Dife	Metribuzin	Metr	Vernolate	Vern

ADDITIONAL RULES

New abbreviations will be assigned as new common names are assigned and will be added to the above list annually.

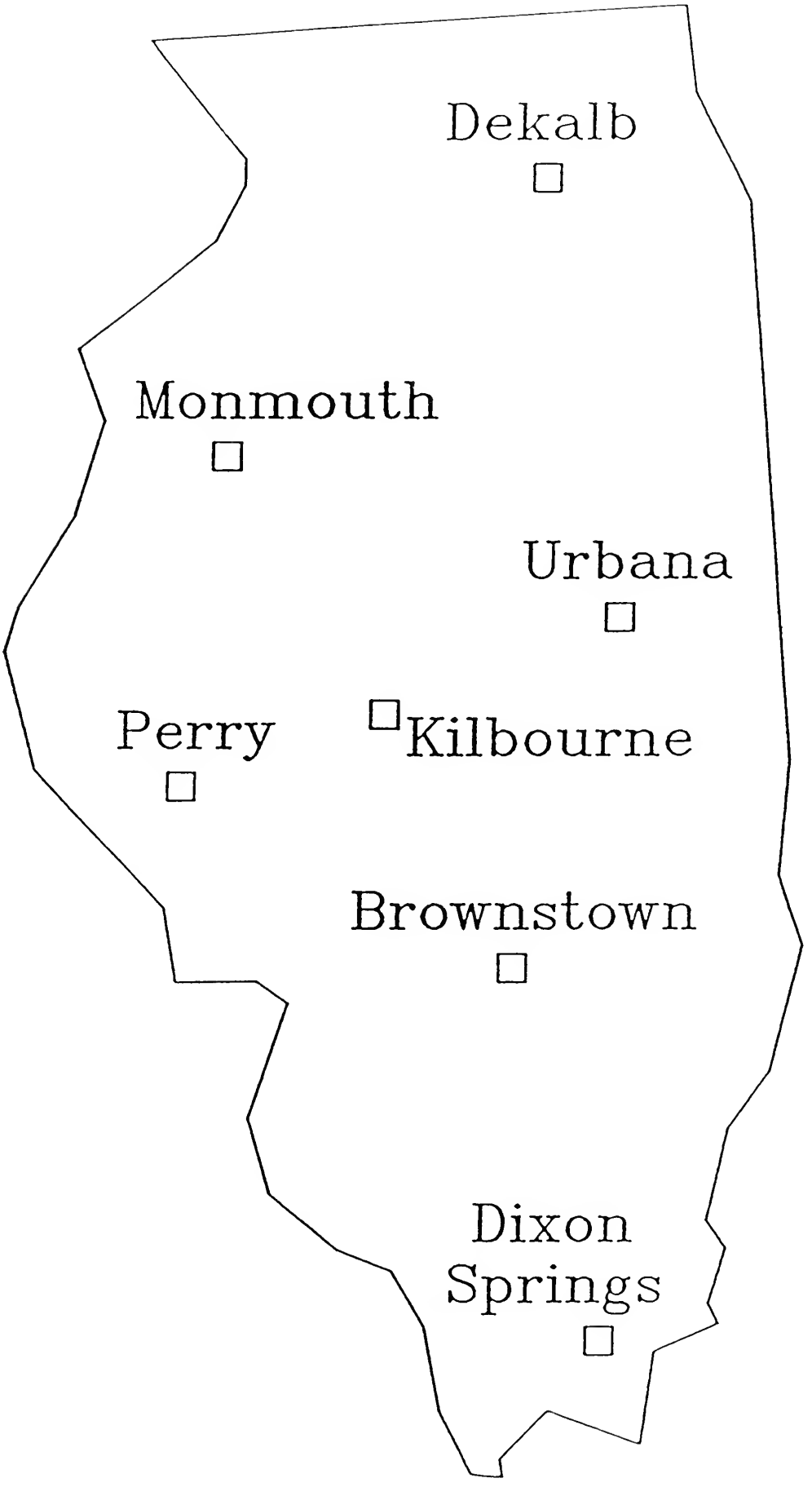
Package mix products (consisting of 2 or more active ingrdients blended by the manufacturer into one product) shall be abbreviated by placing the "&" symbol between the abbreviations of the active ingredients. For example, the package mix of phenmedipham plus desmeipham shall be abbreviated " Phen&desm".

The & symbol also shall be employed when desginating the inclusion within a package mix of substances other than the active ingredients (i.e. EPTC plus cihlormid becomes "EPTC&Dmd"). The & symbol shall be avoided for all other uses. Tank mix combinations shall use the + symbol.

The / symbol shall be used to indicate a time gap between different treatments applied ot the same plot. For examply: Trifluralin (PPI)/Bentazon(Po).

WEED NAMES AND ABBREVIATIONS

Abbreviation	Common Name	Scientific Name
Bucu	Burcucumber	Sicyos angulatus
Bygr	Barnyardgrass	Echinochloa crus-galli
Cath	Canada thistle	Cirsium arvense
Cocb	Common cocklebur	Xanthium strumarium
Coch	Common chickweed	Stellaria media
Colq	Common lambsquarters	Chenopodium album
Corw	Common ragweed	Ambrosia artemisiifolia
Cosf	Common sunflower	Helianthus annuus
Dali	Dandelion	Taraxacum officinale
Dafl	daisy fleabane	Erigeron sp.
Ebns	Eastern black nightshade	Solanum ptycanthum
Fapa	Fall panicum	Panicum dichotomiflorum
Gift	Giant foxtail	Setaria faberi
Girw	Giant ragweed	Ambrosia trifida
Grft	Green foxtail	Setaria viridis
Howe	Horseweed	Conyza canadensis
Ilmg	Ivyleaf morningglory	Ipomoea hederacea
Jiwe	Jimsonweed	Datura stramonium
Lacg	Large crabgrass	Digitaria sanguinalis
Pesw	Pennsylvania smartweed	Polygonum pensylvanicum
Prle	Prickly lettuce	Lactuca serriola
Prsi	Prickly sida	Sida spinosa
Rrpw	Redroot pigweed	Amaranthus retroflexus
Shca	Shattercane	Sorghum bicolor
Shpu	Shepherdspurse	Capsella bursa-pastoris
Smgc	Smooth groundcherry	Physalis subglabrata
Smpw	Smooth pigweed	Amaranthus hybridus
Tamg	Tall morningglory	Ipomoea purpurea
Vele	Velvetleaf	Abutilon theophrasti
Vema	Venice mallow	Hibiscus trionum
Yeft	Yellow foxtail	Setaria glauca


Dekalb
Monmouth
Urbana
Perry
Kilbourne
Brownstown
Dixon
Springs