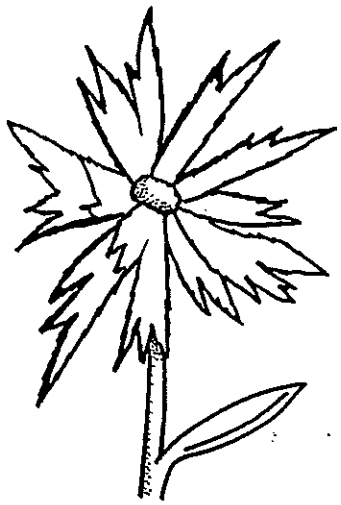
Horticultural Weed Control 1989 Report

Department of Horticulture
Oregon State University
Cordley Hall, Room 2042
Corvallis, OR 97331-2911



Compiled by: Dan Curtis, Research Assistant - Horticultural Weed Science

Ray D. William, Extension Horticultural Weed Specialist

Garvin Crabtree, Professor - Horticultural Weed Science

Secretarial Assistance: Nance Widmer

Not intended nor authorized for publication

Data contained in this report are compiled annually as an aide to complete minor crop registrations for horticultural crops. Data are neither intended nor authorized for publication. Information and interpretation cannot be construed as recommendations for application of any herbicide mentioned in this report.

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THE REPORT

Results from weed management and living mulch trials involving horticultural crops conducted during the past year are compiled and reported by faculty members of the Oregon Agricultural Experiment Station, the Oregon Extension Service, and colleagues who cooperated from adjacent states. This work was conducted throughout Oregon and involved many individuals. The contributors sincerely appreciate the cooperative efforts of the many growers, university employees, and local representatives of the production and agrichemical industries. We also gratefully acknowledge financial assistance from individual growers, grower organizations, and companies which contributed to this work.

INFORMATION AND EVALUATION

Crops were grown at the experimental farms using accepted cultural practices within the limits of experimentation or trials were conducted on growers' fields. Most experiments were designed as randomized complete blocks with two to five replications. Herbicide treatments were applied uniformly with precision plot sprays or granular formulations were distributed from quart jar shakers. Unless otherwise indicated, preplant herbicide applications were incorporated with a PTO horizontal rotary tiller operated at a depth of approximately three inches. After critical application timings, crops were irrigated with overhead sprinklers at weekly intervals or as needed.

Crop and weed responses are primarily visual evaluations of stand reduction (SR) and growth reduction (GR), ranging from 0-100 with 100 as the maximum response for each rating, or an over-all rating of 0-10 for crop response or control of specific weed species with 10 being complete control of the weed or good crop vigor (no injury). Additional data such as crop yields are reported for certain studies and may be reported in either English or metric systems.

HERBICIDES TESTED

Common Name	Trade Name	Page Number
acifluorfen	Tackle, Blazer	14, 34
alachlor	Lasso	76
Ammonium nitrate	AN-20	60
Ammonium thiosulfate	---	60
atrazine	Aatrex	76
bentazon	Basagran	27, 34
CGA-135872	Beacon	76
chloramben	Amiben	34
clomazone	Command	27, 73
clorpyralid	Stinger	64
DCPA	Dacthal	83
dinoseb	Preemerge	11, 14
DPX9360	Accent	76
DPX9406	---	76
EPTC	Genep, Eptam, Erradicane Extra	34, 39, 76
etiozin	Tycor	73
glufosinate	Ignite	14
imazethapyr	Pursuit	49
isoxaben	Gallery, Snapshot	83
lactofen	Cobra	11, 14, 49
linuron	Lorox	73
metolachlor	Dual, Pennant	27, 34, 49, 64, 76, 83
metribuzin	Sencor	27, 73
monocarbomide dihydrogensulfate	Enquik	14, 22
napropamide	Devrinol	64
oxyfluorfen	Goal	11, 14, 34

Common Name	Trade Name	Page Number
paraquat	Gramoxone	76
pendimethalin	Prowl	34, 73, 76
propachlor	Ramrod	27
pyrudate	Lentagran	64
sethoxydim	Poast	64
solution 32	---	60
tridaphane	Tandem	76
trifluralin	Treflan	27, 34, 49, 73
vernolate	Surpass	76

Weather Data 1989

North Willamette Experiment Station

	April		May		June		July		August		September	
	daily precipitation and temperatures (^{o}F maximum and minimum)											
Day	in	min	max	in	min	max	in	min	max	in	min	max
1		41	57		48	80		51	80		50	64		50	67		52	72
2		41	55		43	68		54	85		52	64		49	63		53	71
3		29	51		43	72		52	84		54	75		56	72		45	72
4		40	55		50	70		60	89		50	75		53	73		46	76
5		45	56		51	80		53	90		47	75		52	77		46	80
6		43	66		54	81		53	86		47	80		53	86		46	73
7		48	69		54	76		47	73		51	85		55	90		46	80
8		39	70		50	78		50	75		47	81		57	86		46	85
9		39	69		50	76		51	70		55	69		54	82		50	89
10		46	72		46	58		44	69		56	66		47	75		52	84
11		41	70		43	62		49	80		48	71		42	78		56	86
12		44	73		41	63		50	85		53	84		51	79		52	85
13		50	80		36	63		55	65		53	86		50	79		53	88
14		50	80		37	74		55	75		56	77		50	79		46	93
15		52	75		42	71		53	64		56	78		48	77		45	91
16		38	63		46	80		49	66		54	73		49	75		46	87
17		40	65		51	70		45	70		55	67		50	75		46	76
18		46	74		41	65		48	72		59	79		53	79		39	69
19		52	71		41	60		52	72		62	81		54	86		38	72
20		52	73		39	63		49	66		56	80		55	76		40	72
21		45	60		40	70		46	70		54	71		58	76		46	84
22		40	61		46	60		55	79		48	75		59	75		51	89
23		40	57		43	67		57	78		50	85		55	69		49	95
24		43	66		45	58		61	90		49	81		49	70		50	90
25		42	63		45	58		55	95		49	81		51	69		54	83
26		42	61		48	63		57	88		54	86		54	77		52	73
27		39	66		47	62		50	73		57	68		51	85		54	67
28		40	65		43	60		54	70		48	75		50	80		56	74
29		47	72		44	63		55	69		47	83		51	81		56	89
30		50	79		50	60		54	62		49	72		56	72		55	69
31					46	70					55	76		54	62			
average ttl		44	67		45	68		56	76		52	76		52	77		49	81

note: rainfall data is in the ornamentals section

Weather Data 1989

OSU Vegetable Research Farm

	April			May			June			July			August			September		
	daily precipitation and temperatures (°F maximum and minimum)																	
Day	in	min	max	in	min	max	in	min	max	in	min	max	in	min	max	in	min	max
1	.08	42	56		41	63		52	79		47	64	.26	49	67		48	73
2	.09	40	54		43	68		49	85		51	64	.26	55	62		48	73
3	.13	38	55		42	72		48	85		57	77		47	75		45	74
4	.19	39	58		49	64		60	88		50	75		55	76		43	77
5		45	59		55	80		52	89		44	76		51	80		49	82
6		44	70		54	80		53	82		49	79		55	88		48	74
7	.13	46	73		54	77		42	75		48	85		55	90		46	81
8		45	68		45	78		45	76		45	79		53	89		46	86
9		46	69		46	75		44	72		53	72		54	84		53	88
10		46	77		42	57		45	70		56	68		52	77		53	86
11		39	70		40	63		47	78		49	75		45	78		56	87
12		44	70		40	60		48	81		53	84		49	80		56	86
13		45	77		35	62		55	64		53	82		47	79		47	89
14		48	77		40	70	.24	57	73		53	76		51	81		44	93
15		49	74		43	76	.06	51	64	.30	53	78		47	79		42	92
16		41	64		42	78		42	69		54	75		51	77		45	88
17		41	66		47	70		43	70	.09	56	66		47	76		52	75
18		47	71	.29	36	62		51	74		62	77		48	77		36	70
19	.03	53	71	.11	41	59		51	71		56	82		49	86		36	71
20		51	73		40	64	.13	48	65		52	81		60	82		43	74
21		45	58		45	70		48	71		50	73		56	79		41	80
22		44	60		47	60		48	80		51	75		58	78		50	87
23		41	55	.20	40	67		60	79		47	85	.10	54	68		46	94
24	.55	44	58	.39	44	52		63	89		50	82	.17	47	71		49	90
25	.08	44	60	.06	43	58		52	94		52	82	.18	46	73		52	83
26		46	55		46	63		56	86		56	87		49	79		53	71
27		34	59	.20	49	63		49	74		57	69		46	83		55	69
28		38	64	.10	46	61		52	70		50	77		50	81		48	71
29		48	72		45	65	.16	53	68		49	84		51	82		53	89
30		43	80		42	63	.42	52	62		44	72		56	71		55	66
31					44	70					52	74		55	70			
average		44	66		44	67		51	76		52	77		51	78		48	81
ttl	1.27			1.35			1.01			.39			.97					

note: temperatures are from the OSU Hyslop Farm

Weather Data 1989

Salem WSO Airport

	April			May			June			July			August			September		
	daily precipitation and temperatures (^{o}F maximum and minimum)																	
Day	in	min	max	in	min	max	in	min	max	in	min	max	in	min	max	in	min	max
1	.22	40	55		43	70		48	85	.05	50	64	.08	49	64	.04	49	74
2	.22	34	52		43	73		50	86		52	77	T	54	75		47	74
3	T	35	58	.01	39	66		48	88		57	75		51	76		41	77
4	.12	45	59		48	81		50	90		45	77		57	79		43	81
5		48	70	.02	54	81		50	87		44	80		50	88		49	73
6		43	72		53	78		49	76		46	86		53	91		42	82
7		45	69		49	79		42	76		49	81		53	90		44	86
8		39	69		43	76		46	73		50	71		57	84		47	89
9		41	78	T	46	57		52	71		56	69		55	77		49	86
10		45	71	T	46	61		42	79		56	75		49	78		41	88
11		39	71	.03	42	63		47	85		46	82		45	80		42	87
12		40	78		39	63		48	64		52	86		49	82		43	90
13		42	78		34	72	.05	56	76		57	76		49	80		41	93
14		50	76		41	77	.26	55	65		54	81		50	79		46	92
15	T	48	64		41	80	T	52	71		58	75		45	78		43	88
16		42	64		43	70		43	70	.61	54	67		48	76		45	74
17		39	72	.09	42	65	T	44	75	.22	57	80		56	77	.04	48	70
18		49	73	.03	42	61	T	51	74		61	84		49	87		37	71
19	.05	54	75		42	64	.11	50	68		55	80		49	78		37	73
20	.16	48	60		34	71	.01	49	71		52	72		58	78		39	82
21	T	43	61		46	61		47	80		52	77	.03	60	74		44	89
22	.09	41	57	.16	46	68		48	80		46	86	.37	57	67		47	95
23	.10	40	62	.31	43	56		56	91		49	83		50	74		47	89
24	.03	46	62	.21	46	62		55	96		52	82		51	72		50	84
25	T	48	59	T	46	62		55	89		48	87	T	47	78		51	72
26		38	58	.06	47	65		52	73		56	68		50	85	.26	52	67
27		35	64	.13	48	64		49	70		56	77		49	82		56	73
28		34	73	.03	45	65	.03	53	69		47	84		54	82	.06	47	90
29		36	80		45	62	.57	53	61		51	73		51	74	.63	54	69
30	.07	43	64		46	70	T	51	67		47	76		53	69		47	60
31					43	78				.36	50	68		50	73			
average		42	67		44	68		50	49		52	77		52	78		46	81
ttl	1.06			1.08			1.03			1.24			.48			1.03		

Weather Data 1989

Stayton

	April			May			June			July			August			September		
	daily precipitation and temperatures (°F maximum and minimum)																	
Day	in	min	max	in	min	max	in	min	max	in	min	max	in	min	max	in	min	max
1	.12	41	55	.06	42	61		50	75		49	65	.15	51	67		50	71
2	.16	40	52		44	68		56	81		50	66	.14	52	63	.02	53	71
3	.19	39	53		47	71		51	83		58	73		53	72		45	71
4	.14	42	56		51	72		52	83		51	73		53	75		47	73
5	.08	44	56		57	79		57	88		47	73		52	75		49	73
6		47	70		55	80		54	85		48	77		56	83		47	70
7		47	71	.02	55	76		45	73		51	83		55	86		50	83
8		37	67		46	76		49	73		47	78	.02	59	84		55	85
9		39	65		47	73		52	68		54	70		53	79		46	84
10		46	75	.21	47	55		42	67		55	66		48	73		45	85
11		42	67	.05	42	60		50	76		48	73		47	75		47	84
12		41	69		38	61		52	83		54	82		51	79		51	86
13		44	76		40	62		55	62		54	84		51	79		57	89
14		45	76		43	70	.37	56	72		54	73		59	77		48	92
15		50	73		45	76	.36	52	63		57	78		47	77		46	87
16		42	64		44	77		45	65		54	73		50	74		50	72
17		41	65		48	70		47	68		59	64		49	74		42	72
18		44	71	.20	42	62		49	73		61	77		51	74		40	68
19	.12	52	71	.09	42	56	.18	51	73		58	78		53	82		43	71
20	T	52	73		38	62		49	64		52	77		59	77		45	85
21	.22	46	60		43	68		45	68		53	70	.06	57	78		45	84
22	T	42	58		46	59		50	76		51	72	.45	57	71		45	92
23	.22	38	55	.29	44	67		50	75		52	81	1.45	54	65		50	86
24	.34	44	57	.49	45	54		56	89		51	78	.01	55	70		50	86
25	.16	46	57	.42	46	56		56	96		50	78		53	70		53	72
26	.01	47	55		47	63		54	86	.21	53	83		52	74	.20	51	70
27	.01	38	56	.46	47	62		50	71	.34	57	66		52	81		48	69
28		40	63	.43	44	56		52	67		47	74		49	77	.58	56	65
29		42	71	.04	46	62	.03	54	66		52	81		53	79	.08	56	84
30		46	78		50	60	.35	53	63		51	69	.06	57	71		50	58
31					48	67				.12	51	71		55	66			
average		44	65		44	68		51	74		53	74		53	75		49	78
ttl	1.77			2.76			1.29			.67			2.34			.88		

Weather Data 1989

Troutdale Substation

	April			May			June			July			August			September		
	daily precipitation and temperatures (°F maximum and minimum)																	
Day	in	min	max	in	min	max	in	min	max	in	min	max	in	min	max	in	min	max
1	.08	39	57	.02	52	80		52	81	.02	50	67	.10		73	.20	37	75
2	.25	39	54		43	66		53	88		57	72	.45		70		38	76
3	.17	35	52		43	74		52	88		56	77	.15		75		47	80
4	.24	39	56		48	78		51	85		49	77	T		80		36	84
5	.18	42	52		56	82		54	93		48	73			78		34	83
6		44	70		54	82		48	92		41	84					32	83
7		46	76		57	78		53	87		42	88	.04		88		42	83
8		37	72		53	80		53	77		51	75			80		50	87
9		47	71		50	79		50	70		42	72					53	91
10		45	71	.06	48	58		48	68		42	74					48	83
11		42	72	.01	44	63		52	82		44	76			83		51	86
12		41	75		43	62		53	89		45	89					50	86
13		44	85		39	66		56	67		43	81					46	88
14		47	82		44	76	.23	57	79		55	78			81		49	90
15		52	79		44	78	.30	53	63		57	75					36	84
16		39	68	T	50	82	T	48	71	.36	54	70	T		76	.02	37	76
17		43	65		51	69		47	73	.20	48	70			76	T	36	75
18		44	75	.20	43	70	.03	55	74		46	82			84		40	73
19	.27	53	75	.23	43	60	.04	51	76		48	85	T		78		36	76
20	.05	53	74	T	39	66	.20	50	69		42	76					38	73
21		45	64		43	73		46	69		49	78	.20		78		40	87
22	.02	42	60		47	62		49	81		53	87	1.24		70		44	88
23	T	42	61	.25	44	70		52	83		38	83					47	90
24	T	41	69	.44	46	63		53	94		38	82					49	91
25	.02	45	68	.70	46	62		54	100		44	84			76	.27	54	84
26	1.70	47	67	T	47	64		48	97	.03	40	86			87		38	65
27	.10	44	56	.46	47	62		51	73		47	75			80		44	78
28		40	65	.33	43	60	T	48	73		42	76			86		46	76
29		40	69	.06	47	67	T	50	71		55	85	.02		74		44	78
30		45	71	T	48	58	.18	55	72		59	75			68	.77	42	76
31					47	72					57	78	T		73			
average		43	68		47	70		51	79		48	79			78		43	82
ttl	3.08			2.76			.98			.61			2.20			1.26		

Small Fruit - Summary

Cane suppression in red raspberries and blackberries. Trials conducted for 3 consecutive years were evaluated to assess long term effects of several cane suppressants in red raspberries and blackberries. Oxyfluorfen applied at 0.5 to 2.0 lbs ai/A, 1 or 2 times when new growth was approximately 6 inches tall suppressed primocanes and fruiting spurs. Blackberries required repeated treatments at 1 to 2 lbs ai/A when new canes were 6-8 inches long, or 2 applications were directed toward the crown at 40-60 psi during cane training.

Although adequate crop tolerance exists, current suggestions include 1 or 2 treatments of 0.2 to 0.4 lb ai/A oxyfluorfen in raspberries and repeated spot sprays directed only at the crown in blackberries.

Timing and application of Enquik for raspberry cane suppression. Enquik exhibits promise as a cane desiccant and fertilizer (N and S) for red raspberries. Three trials were conducted to assess timing of Enquik treatments in red raspberries. Enquik applied twice when primocanes were 4 to 6 inches and repeated 7 to 10 days later provided optimum suppression while basal fruiting spurs were controlled regardless of timing. Although we failed to adjust fertilizer rates between plots, growers should adjust rates accordingly.

Cane Suppression in Red Raspberries 1989

D. Curtis, B.C. Strik, R.D. William, and G. Crabtree
Oregon State University, Department of Horticulture

Red raspberries primocanes and basal fruiting spurs were suppressed using 0.5 lb ai/A oxyfluorfen (Goal) applied when new growth was approximately 6 inches tall. Treated foliage was controlled completely resulting in similar cane suppression as the dinoseb practice. Few crippled canes with weak stems were evident. Subsequent cane growth and crop yields at the 2.0 lb ai/A rate were comparable to the lowest rate of oxyfluorfen used and about 30% greater than the untreated control. Injury syptoms caused by the volitilization of oxyfluorfen were not observed.

In conclusion, red raspberries exhibited adequate tolerance and excellent efficacy with two applications of oxyfluorfen at 0.5 lb ai/A directed at the crown for control of fruiting spurs and early season growth of primocanes.

O R E G O N S T A T E U N I V E R S I T Y

RED RASPBERRY 1989 (ROW 18, RESIDUE + EFFICACY)

PROJECT TYPE (H/I etc): H PROJECT NO.:3486 TRIAL ID.:89:OR:002
CITY/COUNTY:SALEM /MARION ST:OR ZIP: COUNTRY:USA
RESEARCH BY:D.CURTIS, R.WILLIAM LAST UPDATE:10/19/33 INITIATED: / /
COOPERATOR :BRET HAURY EXPT. STATUS:C COMPLETED: / /
REPORTED BY:D. CURTIS RELATED FILE:**NONE** SOURCE:

PREVIOUS CROP:N/A PLOT / Ft:3 x15 ROW WIDTH/In:120
PREVIOUS TILL:N/A SOIL TEXTURE:WDBURN SILTYCLAY OM%:3.7
CEC:17 %SAND:26 %SILT:56 %CLAY:18 pH:5.8

PREVIOUS TRT.:DIAZANON 2LB.AI/A 3/4/89 RIDAMIL-NOV,APR EXPT. DESIGN:RCBD
FERTILIZER :500LBS/A OF 10-20-20 ,.33LBS B/A 3/4/89 NUM. OF REPS:4
MISC. INFO. :B. thuringiensis 6/13/89, 6/20/89 REPORT TYPE:FINAL

CROP:RED RASPBERRY VARIETY:WILLAMETTE
PLANTING DATE:03/01/86 DEPTH/In:TRNSPL SPACING/In:30"/PLANT NUM.PLANTS:6/P
HARVEST DATE :06/22/89 SEASONAL RAINFALL DURING EXPERIMENT
RESIDUE TAKEN:Y EARLY: MID: LATE:

Cane supression rating averages and yield averages by treatment

TRT. NO.	NAME	Lbai/a	FLORAL SUPRSN 5/02/89	PRIMO SUPRSN 5/02/89	PRIMO SUPRSN 5/25/89	BERRYHV TONS/A 6/22/89	BERRYHV 50BY/WT 6/22/89
01	GOAL	0.5	10	8	8.3	5.4	128
	X-77	0.25% V/V					
02	GOAL	1.0	10	9	9.5	5.7	139
	X-77	0.25% V/V					
03	GOAL	2.0	10	10	10.0	5.3	130
	X-77	0.25% V/V					
04	COBRA	0.5	10	8	7.5	5.6	125
05	DINITRO	2.5	10	7	6.3	4.9	123
	CROP OIL						
06	HANDRMVL		8	8	4.0	4.1	133
07	CHECK		0	0	0	3.6	125
	LSD(0.05) =		3	3	1.1	1.1	19
	STD. DEV. =		2	2	.8	.7	13
	CV. =		23	26	11.6	14.6	10

VOLUME OF WATER CARRIER FOR DINOSEB WAS 100 G/A FOR BOTH APPLICATIONS. VOLUME OF WATER CARRIER FOR GOAL AND COBRA TREATMENTS WAS 30 G/A FOR BOTH APPLICATIONS.

CANE SUPPRESSION RATING: 0 = NO SUPPRESSION
10 = COMPLETE SUPPRESSION

Cane Suppression in Red Raspberries 1989
application data

GEN. APPLIC. TYPE	APPLIC. 1 POST	APPLIC. 2 POST
APPLICATION DATE	04/17/89	05/02/89
JULIAN DATE/YEAR	J107/89	J122/89
START HR / END HR	02:50/04:10	04:00/05:00
APPLIC. METHOD	DIR SPR	DIR SPR
AIR/SOIL TEMP (F)	66 / 65	77 / 66
% REL. HUMIDITY	0	0
WIND DIR. / VELOC	NE / 2	- / 0
SKY / SOIL COND.	P.CLD/CLODY	SUNNY/DRY
SOIL/LEAF MOIST.	DRY / DRY	DRY / DRY
INCORP. EQUIPMENT	--	--
INCORP. DEPTH(in)	0	0
SPRAYER TYPE	UNI.COMPAIR	UNI.COMPAIR
SPRAYER GPA / PSI	38 / 0	38 / 0
MIX SIZE (Gallon)	0.031	0.031
NOZZLE TYPE /NUM.	1 D-3 HC	1 D-3 HC
RAINFALL/IRRIG.in		
0-24 HR/1-3 DAYS	0 / .21	.01 / .02
4-7 DAYS/2ND WEEK	.22 / .07	T / .03
3RD WEEK/4TH WEEK	.03 / .03	.59 / ..43

	SPECIE CODE	SPECIES	APPLIC. 1 DEN./STG.	APPLIC. 2 DEN./STG.
	*******	****** CROP ******	*********	*********
		RASPBERRIES CANES	/3-5"	/
	*******	****** PEST ******	*********	*********
1		GOAL AT 2.00 LB CA	NES/	/0-1"
2		1.00	/	/0-3"
3		0.50	/	/0-4"
4		COBRA	/	/0-5"
5		DINITRO	/	/2-6"

Cane suppression of evergreen blackberries 1989

D. Curtis, B.C. Strik, R.D. William, and G. Crabtree
Oregon State University Hortculture Department

Cane suppression in bearing blackberries is required to enhance mechanical harvest of fruit. Oxyfluorfen (Goal) applied repeatedly when new canes reached 6 to 8 inches controlled existing growth. Thorough coverage of the cane tips was essential. Nozzles were directed to spray an 18 inch high band along the row to ensure spray contact with the cane tips. Residue samples were harvested 14 days earlier than in 1988 due to the advanced season in 1989. Experience with oxyfluorfen suggests that applications should cease during flowering to avoid environmental factors that could cause evaporation and leaf "speckling" or "flecking".

Cane training during alternate year requires 2 applications of oxyfluorfen to control basal leaves and lateral shoots that interfere with harvest and harbor pests the following year. Penetration of the dense foliage can be achieved after tying canes upright to the wire with 40-60 psi treatments aimed at the crown. The second spray may be required to complete the control of basal leaves and suppress lateral growth that is 6 - 8 inches long.

O R E G O N S T A T E U N I V E R S I T Y

CANE SUPPRESSION OF EVERGREEN BEARING BLACK BERRIES 1989

PROJECT TYPE (H/I etc): H PROJECT NO.:3485 TRIAL ID.:89.OR.001
CITY/COUNTY:BROOKS, MARION ST:OR ZIP: COUNTRY:USA
RESEARCH BY:CURTIS, WILLIAM LAST UPDATE:10/20/33 INITIATED:04/24/89
COOPERATOR :GARY CLARK EXPT. STATUS: COMPLETED:09/05/89
REPORTED BY:DAN CURTIS RELATED FILE:**NONE** SOURCE:
PREVIOUS CROP:N/A PLOT / Ft:3 x30 ROW WIDTH/In:120
PREVIOUS TILL:N/A SOIL TEXTURE:WDBURN SILT LOAM OM%:3.7
CEC:17 %SAND:26 %SILT:56 %CLAY:18 pH:5.8
PREVIOUS TRT.:GRAMOXONE & SOLICAM FOR GRASS CONTROL EXPT. DESIGN:RCBD
FERTILIZER :150LBS N/A NUM. OF REPS:4
MISC. INFO. :ROVRAL FOR BOTRYTIS REPORT TYPE:FINAL
CROP:BLACKBERRY VARIETY:EVERGREEN
PLANTING DATE: / / DEPTH/In: SPACING/In:10 FOOT NUM.PLANTS:3/P
HARVEST DATE : / / SEASONAL RAINFALL DURING EXPERIMENT
RESIDUE TAKEN:Y EARLY: MID: LATE:

RATINGS
0 = NO SUPPRESSION
10 = COMPLETE SUPPRESSION

DINOSEB APPLIED AT 100 GALLONS/ACRE CARRIER VOLUME
GOAL AND COBRA APPLIED AT 30 GALLONS/ACRE CARRIER VOLUME

Cane suppresiom rating averages and yield averages by treatment

TRT. NO.	NAME	LBai/A	CANE SUPPRSN 5/11/89	CANE SUPPRSN 5/25/89	CANE SUPPRSN 6/26/89	CANE SUPPRSN 7/21/89	CANE SUPPRSN 8/07/89	BERRYHV TONS/A 9/06/89
01	GOAL X-77 0.25% V/V	0.5	6.3	7	6	6	6	11.35
02	GOAL X-77 0.25% V/V	1.0	7.8	8	6	7	7	11.63
03	GOAL X-77 0.25% V/V	2.0	8.9	9	7	7	8	11.81
04	COBRA X-77 0.25% V/V	0.5	6.0	7	6	6	7	11.97
05	DINOSB CROP OIL	2.5	8.6	9	6	6	7	11.21
06	CHECK		0	0	0	0	0	10.69
	LSD(0.05) =		1.1	1	1	1	1	1.68
	STD. DEV. =		.7	1	1	0	1	1.12
	CV. =		11.2	9	12	8	12	9.77

CANE SUPPRESSION OF EVERGREEN BEARING BLACK BERRIES 1989
application data

** SET 1 OF 3 **	APPLIC. 1	APPLIC. 2	APPLIC. 3	APPLIC. 4	APPLIC. 5
GEN. APPLIC. TYPE	POST 1	POST 2	POST 3	POST 4	POST 5
APPLICATION DATE	04/24/89	05/11/89	06/06/89	06/30/89	07/24/89
JULIAN DATE/YEAR	J114/89	J131/89	J157/89	J181/89	J205/89
START HR / END HR	12:15/01:30	04:45/05:55	03:00/04:30	02:00/03:45	01:00/02:35
APPLIC. METHOD	DIRSPRY	DIRSPRY	DIRSPRY	DIRSPRY	DIRSPRY
AIR/SOIL TEMP (F)	55 / 52	57 / 62	68 / 74	64 / 64	74 / 78
% REL. HUMIDITY	0	47	78	56	60
WIND DIR. / VELOC	NE / 3	/ 0	/ 0	S / 10	N / 05
SKY / SOIL COND.	OVCST/DRY	PCLDY/DRY	SUNNY/DRY	OVCST/DRY	CLEAR/DRY
SOIL/LEAF MOIST.	DRY / DRY	DRY / DRY	DRY / DRY	/	DRY / DRY
INCORP. EQUIPMENT					
INCORP. DEPTH(in)	0	0	0	0	0
SPRAYER TYPE		UNICYCLE	UNICYCLE	UNICYCLE	UNICYCLE
SPRAYER GPA / PSI	30 / 38	30 / 38	30 / 38	30 / 38	30 / 38
MIX SIZE (Gallon)	.062	.062	.062	.062	.062
NOZZLE TYPE /NUM.		HC D3-25	HC D3-25	HC D3-25	HC D3-25
RAINFALL/IRRIG.in					
0-24 HR/1-3 DAYS	/	/	/	/	/
4-7 DAYS/2ND WEEK	/	/	/	/	/
3RD WEEK/4TH WEEK	/	/	/	/	/

	SPECIE CODE	SPECIES	APPLIC. 1 DEN./STG.	APPLIC. 2 DEN./STG.	APPLIC. 3 DEN./STG.	APPLIC. 4 DEN./STG.	APPLIC. 5 DEN./STG.
	*******	****** CROP ******	*********	*********	*********	*********	*********
		BLACKBERRIES	/	/	/	/	/
	*******	****** PEST ******	*********	*********	*********	*********	*********
1		SHOOTS	20/HILL	12"/	4- 16"	4-/24	2-/24
2			12-14"	TRIMMED	A FEW	/	/
3			SOME UP	OFF ESCPS	> /24"	/	/
4			TO /24"	>18 INCH	/	/	/

CANE SUPPRESSION OF NON-BEARING BLACKBERRIES, 1989

** SET 1 OF 1 **	APPLIC. 1	APPLIC. 2	APPLIC. 3	APPLIC. 4	APPLIC. 5
GEN. APPLIC. TYPE	POST 1	POST 2			
APPLICATION DATE	07/07/89	08/10/89	/ /	/ /	/ /
JULIAN DATE/YEAR	J188/89	J222/89	J /	J /	J /
START HR / END HR	02:30/03:30	01:05/02:15	: / :	: / :	: / :
APPLIC. METHOD	DSPRAY	DSPRAY			
AIR/SOIL TEMP (F)	81 / 88	79 / 82	0 / 0	0 / 0	0 / 0
% REL. HUMIDITY	41	49	0	0	0
WIND DIR. / VELOC	SW / 3	N / 3	/	/ 0	/ 0
SKY / SOIL COND.	CLEAR/NA	CLEAR/NA	/	/	/
SOIL/LEAF MOIST.	DRY / DRY	DRY / DRY	/	/	/
INCORP. EQUIPMENT	NA	NA			
INCORP. DEPTH(in)	0	0	0	0	0
SPRAYER TYPE	COMP/AIRUNI	COMP/AIRUNI			
SPRAYER GPA / PSI	30 / 38	30 / 38	0 / 0	0 / 0	0 / 0
MIX SIZE (Gallon)	.062	0.062	0	0	0
NOZZLE TYPE /NUM.	D3-25 HC	D3-25 HC			
RAINFALL/IRRIG.in					
0-24 HR/1-3 DAYS	/	/	/	/	/
4-7 DAYS/2ND WEEK	/	/	/	/	/
3RD WEEK/4TH WEEK	/	/	/	/	/

	SPECIE CODE	SPECIES	APPLIC. 1 DEN./STG.	APPLIC. 2 DEN./STG.	APPLIC. 3 DEN./STG.	APPLIC. 4 DEN./STG.	APPLIC. 5 DEN./STG.
	*******	****** CROP ******	*********	*********	*********	*********	*********
		EVERGREEN BBERRIES	/	/	/	/	/
	*******	****** PEST ******	*********	*********	*********	*********	*********
1		BASAL SHOOTS	/18"	/10"	/	/	/
2			/	/	/	/	/
3			/	/	/	/	/
4			/	/	/	/	/
5			/	/	/	/	/
6			/	/	/	/	/
7			/	/	/	/	/
8			/	/	/	/	/
9			/	/	/	/	/
	UNIFORM STANDARD TREATMENT						
	UNIFORM TRT. RATE AND UNIT						

CANE SUPPRESSION OF NON-BEARING BLACKBERRIES, 1989

EXPT. LOCATION: BROOKS, MARION, OR USA
RESEARCH BY: WILLIAM, CURTIS INITIATED: 07/07/89 COMPLETED: 10/30/89

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	CANE SUPPRSN 7/21/89	CANE SUPPRSN 8/28/89
01	GOAL	EC 1.6	0.5	POST	5	5
	X-77	%A	0.25%	POST		
02	GOAL	EC 1.6	1.00	POST	7	5
	X-77	%A	0.25	POST		
03	GOAL	EC 1.6	2.00	POST	7	6
	X-77	%A	0.25%	POST		
04	COBRA	EC 2.00	0.50	POST	6	7
	X-77	%A	0.25%	POST		
05	PREMERGE	EC 5.00	2.50	POST	6	7
	OIL	EC 1.0	1.0%	POST		
06	CHECK				0	0
			LSD(0.05) =		1	1
			STANDARD DEVIATION =		1	1
			COEFF. OF VARIABILITY =		17	11

O R E G O N S T A T E U N I V E R S I T Y

ALTERNATIVES TO DINOSEB IN BLACKBERRY PRODUCTION 1989 (#2)

PROJECT TYPE (H/I etc): H PROJECT NO.: TRIAL ID.:BLK89-N2
CITY/COUNTY:WACONDA RD./MARION ST:OR ZIP: COUNTRY:USA
RESEARCH BY:D.CURTIS, R. WILLIAM LAST UPDATE: INITIATED:04/27/89
COOPERATOR :GARY CLARK EXPT. STATUS:O COMPLETED:08/28/89
REPORTED BY:D.CURTIS, J. IRVINE RELATED FILE:BLKBER89 SOURCE:GARY CLARK

PREVIOUS CROP:N/A PLOT / Ft:3 x30 ROW WIDTH/In:120
PREVIOUS TILL:N/A SOIL TEXTURE:WDBURN SILT LOAM OM%:3.7
CEC:17 %SAND:26 %SILT:56 %CLAY:18 pH:5.8

PREVIOUS TRT.:PARAQUOT & SOLICAM FOR GRASS CONTROL EXPT. DESIGN:RCBD
FERTILIZER : NUM. OF REPS:4
MISC. INFO. : REPORT TYPE:INTERIM

CROP:BLACKBERRY VARIETY:EVERGREEN
PLANTING DATE: / / DEPTH/In: SPACING/In:120 NUM.PLANTS:3/P
HARVEST DATE : / / SEASONAL RAINFALL DURING EXPERIMENT
RESIDUE TAKEN: EARLY: MID: LATE:

PRIMARY RATE UNIT:LBai/A RATE UNIT [B]: RATE UNIT [C]:

EXPERIMENT COMMENTS

This trial was initiated to test the effacy of EnQuick, Ignite and Blazer on blackberries. The trial was located near Brooks Oregon on Waconda Rd.

Only two applications of EnQuick were made do to the nitrogen content of the material.

Ignite and Blazer were applied at 30 gallons / acre carrier volume.

ALTERNATIVES TO DINOSEB IN BLACKBERRY PRODUCTION 1989 (#2)

** SET 1 OF 1 **	APPLIC. 1	APPLIC. 2	APPLIC. 3
GEN. APPLIC. TYPE	POST 1	POST 2	POST 3
APPLICATION DATE	04/27/89	06/12/89	06/30/89
JULIAN DATE/YEAR	J117/89	J163/89	J181/89
START HR / END HR	02:00/03:15	04:30/05:45	02:00/03:45
APPLIC. METHOD	DIRSPRY	DIRSPRY	DSPRAY
AIR/SOIL TEMP (F)	64 / 66	66 / 72	64 / 64
% REL. HUMIDITY	0	66	56
WIND DIR. / VELOC	NE / 02	/ 0	S / 5
SKY / SOIL COND.	CLEAR/	OVCST/	OVCST/
SOIL/LEAF MOIST.	MDR / NUL	DRY /	DRY /
INCORP. EQUIPMENT			
INCORP. DEPTH(in)	0	0	0
SPRAYER TYPE	UNICYCLE	UNICYCLE	UNICYCLE
SPRAYER GPA / PSI	30 / 45	30 / 45	30 / 45
MIX SIZE (Gallon)	.062	.062	.062
NOZZLE TYPE /NUM.	HCONE D3	HCONE D3	HC D-3

SPECIE CODE	SPECIES	APPLIC. 1 DEN./STG.	APPLIC. 2 DEN./STG.	APPLIC. 3 DEN./STG.
*******	****** CROP ******	*********	*********	*********
		/	/	/
*******	****** PEST ******	*********	*********	*********
	PRIMOCANES	12 - 36"	TRIMMED	3- 24"

FILE NAME:BLK89-N2.EXP INTERIM PRINTED:04/03/90

O R E G O N S T A T E U N I V E R S I T Y

ALTERNATIVES TO DINOSEB IN BLACKBERRY PRODUCTION 1989 (#2)

EXPT. LOCATION:WACONDA RD./MARION, OR USA
RESEARCH BY:D.CURTIS, R. WILLIAM INITIATED:04/27/89 COMPLETED:08/28/89

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLICATION TYPE	CANE SUPPRSN 7/21/89	CANE SUPPRES 8/07/89	SOBERRY WEIGHTS 8/10/89	SOBERRY WEIGHTS 8/28/89						
01	ENQUICK	EC	1.00 15.00	POST	1.8	0	249	244						
	I-77	%A	1.00 0.25	POST										
02	IGNITE	SC	1.67 0.50	POST	9.1	9	255	259						
03	IGNITE	SC	1.67 1.00	POST	10.0	10	255	239						
04	BLAZER	SC	2.00 0.50	POST	5.3	5	224	233						
	I-77	%A	1.00 0.25	POST										
05	BLAZER	SC	2.00 1.00	POST	5.3	4	245	245						
	I-77	%A	1.00 0.25	POST										
06	CHECK				0	0	243	242						
				LSD(0.05) =	.7	1	26	30						
				STANDARD DEVIATION =	.5	1	17	20						
				COEFF. OF VARIABILITY =	9.4	13	7	8						

Enquik for caneburning in red raspberries. Kaufman, D., A. Sheets, and K. Olson. The removal of early primocane growth and lower foliage from fruiting canes enhances production of machine harvested raspberries. The recent loss of dinoseb has necessitated the search for alternatives. This research was conducted in three commercial fields in the Portland area to evaluate the effectiveness of *monocarbamide dihydrogensulfate* (Enquik) for caneburning on red raspberry varieties, 'Meeker' and 'Willamette'.

Each experiment was randomized in a complete block design with four replications. Plots were 3 feet wide by 30 feet long, consisting of 10 to 15 plants depending on growers' spacing within the row.

Application equipment involved a bicycle sprayer which was calibrated to deliver a total of 30 gallons spray per acre (15 gallons to each side of the row) at a pressure of 40 psi through 8002 flat fan nozzles set in a double-overlap pattern. Enquik was applied at a rate of 15 gallons per acre in 15 gallons of water with 0.5% AG 98 surfactant. Some treatments received two applications of Enquik separated by 1 or 2 weeks while others received only one. For purposes of comparison, treatments of 50 and 100 gallons diesel oil per acre also were included. Treatments were compared to an untreated control and adjacent rows treated by growers using dinoseb.

Because timing is an important factor. Enquik treatments were applied at various stages of primocane height representing approximately 0-4, 4-10, 10-14, or 10-18 inches.

Visual evaluations for control of lower fruiting laterals and suppression of primocanes were recorded in all three fields on 4/26 and data presented for 5/12 only. Fruiting laterals that interfere with mechanical fruit harvest were controlled with most Enquik timings except single treatments applied late or 50 gal/A diesel. Primocane suppression was achieved by waiting for 4 to 6 inches of growth and repeating the treatment 7 to 10 days later. Warm weather without rain for several hours were required for maximum response. Although ratings for dinoseb were slightly better than Enquik, growers confirmed that the response was adequate.

Although yield was not measured in the research plots, 100 fruits were randomly harvested and weighed from each plot in fields 1 and 3. Significant differences were lacking for fruit weight among any of the treatments.

After harvest on 8/24, all treatments in Field #1 were evaluated for number of canes per hill, cane diameter, cane height, and number of branched or twisted canes. Significant differences were lacking in cane number or diameter. Cane heights were similar among all Enquik applications and were significantly shorter than cane heights in either the control or dinoseb treatments. However, none of the treatments resulted in

heights which were considered inadequate (below 72 inches), nor were differences of 10 inches considered significant in terms of production. The number of branched canes was greatest in treatments where Enquik was applied only one time after primocanes were 10 inches high or greater. (Assistant Professor, Professor, and Graduate Assistant, Extension Service, Oregon State Univeristy, Corvallis, OR 97330.)

Table 1. Visual ratings of fruiting spur control and primocane suppression recorded approximately 2 weeks after normal caneburning season, Clackamas County, Oregon, 1989.[a]

Treatments and timing[b]	Primocane height (inches)	Fruiting Cane			Primocane		
		Field: #1	#2	#3	Field: #1	#2	#3
Control	---	0	0	0	0	0	0
Enquik early+mid (1wk)	0-4 4-10	9.0	9.1	9.1	5.5	5.2	3.6
Enquik early+late (2wk)	0-4 10-14	9.6	8.0	8.4	6.6	5.6	5.2
Enquik mid	4-10	8.4	7.8	7.7	5.4	5.5	4.0
Enquik mid+late (1wk)	4-10 10-14	9.2	8.4	8.8	7.4	7.4	6.4
Enquik late	10-14	6.5	3.1	4.9	5.6	3.1	4.8
Enquik late+v.late (1wk)	10-14 10-18	7.3	5.8	6.1	8.9	7.5	8.0
Enquik very late	10-18	3.0	2.1	---	7.2	6.9	---
Diesel (25) early+mid (1wk)	0-4 4-10	6.1	3.4	3.2	2.5	1.5	1.8
Diesel (50) early+mid (1wk)	0-4 4-10	7.8	6.1	7.1	5.1	3.2	4.0

[a] Ratings averaged from 2 persons; Enquik (15 gal) diluted in 15 gal water/A; Diesel at 25 and 50 gal/A applied twice; Ratings: 0 = no control, 10 = perfect control.

[b] Dates of application and conditions:
Early - April 10; 65F, sunny, calm
Mid - April 18; 65F, sunny, calm
Late - April 25; 55F, cloudy + rain 4 hours
Very Late - May 1; 55F, cloudy, warming to 65°F

Table 2. Red raspberry growth comparisons treated with Enquik and diesel at various stages of growth in early spring, Clackamas County, Oregon. 1989[a]

Treatments and timing[b]	Primocane height (inches)	Cane			
		Number/ hill	Diameter (min)	Height (inches)[c]	No branched/ plant[c]
Control	---	14.6	8.9	96	0.03
Enquik early+mid (1wk)	0-4 4-10	12.7	8.7	86	0.12
Enquik early+late (2wk)	0-4 10-14	12.3	8.4	86	0.37
Enquik mid	4-10	13.2	8.4	87	0.18
Enquik mid+late (1wk)	4-10 10-14	12.2	8.5	87	0.31
Enquik late	10-14	11.4	8.6	86	0.59
Enquik late+v.late (1wk)	10-14 10-18	11.8	7.8	85	0.18
Enquik very late	10-18	10.8	8.6	79	0.78
Diesel (25) early+mid (1wk)	0-4 4-10	13.2	9.0	92	0.09
Diesel (50) early+mid (1wk)	0-4 4-10	11.2	9.0	89	0
LSD (P=0.05)	---	NS	NS	7	0.29

[a] Ratings averaged from 2 persons; Enquik (15 gal) diluted in 15 gal water/A; Diesel at 25 and 50 gal/A applied twice.

[b] Dates of application and conditions:

Early	- April 10;	65F,	sunny, calm
Mid	- April 18;	65F,	sunny, calm
Late	- April 25;	55F,	cloudy + rain 4 hours
Very Late	- May 1;	55F,	cloudy, warming to 65°F

[c] Comparisons with adjacent dinoseb treatments applied twice were 95 inch cane heights and 0.06 branches/plant.

Vegetable Crops - Summary

Pea weed control. Weed infestations in 2 of 3 trials on growers' fields were negligible, thereby suggesting the possibility of field mapping/sampling and prescriptive postemergence weed control practices. In a third trial, lambsquarter reduced pea yields except in trifluralin and clomazone plots. Trifluralin, however, reduced plant populations although yields were not suppressed. Except for clomazone residual for subsequent crop rotations, all other herbicides (propachlor, metolachlor, metribuzin, and bentazon) provided adequate crop safety.

Snap bean weed control. Acifluorfen applied preemergence injured beans grown on soils containing minimal clay, whereas postemergence treatments controlled pigweed and groundsel with excellent crop tolerance. Oxyfluorfen applied as preemergence directed between rows provided acceptable selectivity, although injury occurred when overlapped onto the bean row. Pendimethalin applied preemergence improved crop selectivity compared to preplant incorporated treatments. Bentazon applied early postemergence controlled shepardspurse, but inconsistent results with groundsel. Dash surfactant improved weed control with bentazon slightly, whereas UAN 32 failed to improve control.

Water activation of herbicides in snap beans. A line-source experiment involving water gradients applied and 14 days after spraying herbicides revealed that metolachlor required immediate activation with approximately 1 inch water. Lactofen, in contrast, was active on susceptible weeds regardless of water level or time of application.

N - fertilizers as contact herbicides in broccoli. Directed sprays of liquid N fertilizers applied to small weeds between 2-leaf broccoli resulted in optimum control with minimal crop injury. Differences between N fertilizer compounds were minimal, although combinations of AN-20+ammonium thiosulfate or AN-20+Solution-32 caused less broccoli injury.

Lentagran performance in cabbage and broccoli. Crop tolerance to lentagran was moderate suggesting early postemergence applications using reduced rates, perhaps in split treatments should be considered in future trials.

Carrot weed control. Although weed pressure was intense, combinations of trifluralin+clomazone, clomazone+metribuzin, clomazone+etiozin, and pendimethalin alone exhibited promise for selective weed control in carrots.

Wild proso millet control in sweet corn. In addition to suppressive cultural practices such as crop rotations, close row spacings, and late plantings, nearly perfect early season control of wild proso millet followed by postemergence directed treatments to eliminate remaining plants was required in sweet corn production. Although EPTC (Eradicane-Extra) was applied at 4.0 lb ai/A, it exhibits promise for wild proso millet control as an early season treatment. Postemergence-directed applications of ametryne (Evik) by the grower suggest excellent control after corn whorls are taller than 12 inches.

Weed Control Alternatives in Drilled Peas

Dan Curtis and Ray D. William, Horticulture Department
Robert L. Rackham, Benton County Extension
Oregon State University

Narrative: Peas tolerated most herbicides evaluated in three field trials conducted with grower-cooperaters in 1989. The exception was trifluralin (Treflan) which reduced early growth and vigor by 10 to 40%. By harvest, the remaining plants in trifluralin treatments compensated and yields were similar to other treatments. Clomazone (Command) caused white leaves on young seedlings, especially following rainfall or irrigation. Symptoms disappeared within several days. Growth and yields were not suppressed, although observations from previous trials at higher rates suggest that soil persistance can be a serious threat to subsequant crops including fall-planted wheat.

Lambsquarter infested only one trial where trifluralin provided optimum control. Other acceptable treatments included clomazone at 0.25 to 0.33 lbs. ai/acre. Bentazon (Basagran) applied postemergence failed to control lambsquarter, probably due to excessive size.

Year-round weed management strategies were demonstrated in at least two of the trial sites where weed interference failed to depress yields in the non-treated controls. Both growers had practiced some sort of postharvest weed control that prevents increases in the seed bank.

O R E G O N S T A T E U N I V E R S I T Y

ALTERNATIVES TO DINOSEB IN PEA PRODUCTION

** SET 1 OF 1 **	APPLIC. 1	APPLIC. 2	APPLIC. 3
GEN. APPLIC. TYPE	PPI	PRE	EPOST
APPLICATION DATE	04/07/89	04/07/89	04/26/89
JULIAN DATE/YEAR	J 97/89	J 97/89	J116/89
START HR / END HR	11:00/12:10	14:30/15:00	16:00/16:30
APPLIC. METHOD	BRDCAST	BRDCAST	BRDCAST
AIR/SOIL TEMP (F)	61 / 63	61 / 63	61 / 66
% REL. HUMIDITY	0	0	0
WIND DIR. / VELOC	NE / 05	NE / 05	W / 08
SKY / SOIL COND.	OVCST/CLDY	OVCST/CLDY	PCLDY/CLODY
SOIL/LEAF MOIST.	MST / -	.5D /	DRY / DRY
INCORP. EQUIPMENT	SHANK/HARRW	HORT RAKE	
INCORP. DEPTH(in)	3 INCHES	1 INCH	0
SPRAYER TYPE	UNICYCLE	UNICYCLE	UNICYCLE
SPRAYER GPA / PSI	22.68 / 0	22.68 / 0	22.68 / 0
MIX SIZE (Gallon)	0.125	0.125	0.125
NOZZLE TYPE /NUM.	8003-5	8003-5	8003-5

ALTERNATIVES TO DINOSEB IN PEA PRODUCTION
EXPT. LOCATION:BENTON COUNTY, OR
RESEARCH BY:R.L.R.,D.W.C.,R.D.W. INITIATED:04/07/89

TRT. NO.	PESTICIDE NAME	LBai/A	TYPE	PEAS %INJURY 4/26/89	PEAHVST GROSSWT 6/21/89	PEAHVST # PLNTS 6/21/89	P.2 POD RATIO 6/21/89	PEAHVST WEED(G) 6/21/89	PEAHRVST TONS/A 6/21/89
01	CHECK			6	5.30	42	.37	36.8	4.79
02	COMMAND	0.25	PPI	10	4.94	39	.38	10.5	4.76
03	COMMAND	0.33	PPI	1	5.58	50	.36	.1	5.05
04	COMMAND	0.50	PPI	9	4.93	40	.38	4.3	4.65
05	COMMAND	0.33	PPI	9	5.47	42	.36	1.5	4.98
	SENCOR	0.18	PRE						
06	COMMAND	0.33	PPI	4	5.16	39	.35	0	4.80
	BASAGRAN	0.50	EPOST						
07	SENCOR	0.18	PRE	6	4.69	35	.33	1.9	4.00
	BASAGRAN	0.50	EPOST						
08	TREFLAN	0.50	PPI	11	5.02	45	.37	6.0	4.69
	BASAGRAN	0.50	EPOST						
09	BASAGRAN	0.500	EPOST	4	4.63	42	.35	0	4.32
	RAMROD	5.00	PRE						
10	TREFLAN	0.50	PPI	8	5.21	43	.33	8.5	3.68
	RAMROD	5.00	PRE						
11	TREFLAN	0.50	PPI	26	4.49	38	.36	3.0	3.85
	DUAL	2.00	PRE						
12	BASAGRAN	0.50	EPOST	13	4.21	38	.36	2.0	3.48
	DUAL	2.00	PRE						
		LSD(0.05) =		19	1.24	10	.07	18.5	1.54
		STD DEV =		13	.86	7	.05	12.8	1.07
		CV =		152	17.27	17	13.67	206.1	24.17

FILE NAME:PEA89-02.EXP

ALTERNATIVES TO DINOSEB IN PEA PRODUCTION

** SET 1 OF 1 **	APPLIC. 1	APPLIC. 2
GEN. APPLIC. TYPE	PPI	PRE
APPLICATION DATE	04/08/89	04/08/89
JULIAN DATE/YEAR	J 98/89	J 98/89
START HR / END HR	10:00/10:45	12:00/12:40
APPLIC. METHOD	BRDCAST	BRDCAST
AIR/SOIL TEMP (F)	12 / 11	15 / 14
% REL. HUMIDITY	0	0
WIND DIR. / VELOC	NE / 06	/ 0
SKY / SOIL COND.	CLEAR/FINE	/SDBED
SOIL/LEAF MOIST.	M-D /	DRY /
INCORP. EQUIPMENT	CHZHRRW/CLT	HORT RAKE
INCORP. DEPTH(in)	3	0.5
SPRAYER TYPE	UNICYCLE	UNICYCLE
SPRAYER GPA / PSI	22.68 / 30	22.68 / 30
MIX SIZE (Gallon)	0.125	0.125
NOZZLE TYPE /NUM.	F.T. 8003-5	F.T. 8003-5

O R E G O N S T A T E U N I V E R S I T Y

ALTERNATIVES TO DINOSEB IN PEA PRODUCTION

OFF-STATION TRIAL # 2

EXPT. LOCATION:OFF RIVER RD/LONGTOM BENTON, OR 97330 USA

TRT. NO.	PESTICIDE NAME	LBai/A	TYPE	INJURY CHLOR 4/24/88	INJURY STUNTNG 4/24/89	PEAHARV GROSSWT 6/22/89	PEAHVST # PLANT 6/22/89	P.2 POD RATIO 6/22/89	PEAHVST WEED(G) 6/22/89	P.HRVST TONS/A 6/22/89
01	CHECK			.0	0	2.50	53	.51	1.3	2.98
02	COMMAND	0.25	PPI	.5	.05	2.79	49	.48	0	2.87
03	COMMAND	0.33	PPI	.3	.04	2.80	54	.48	0	2.85
04	COMMAND	0.50	PPI	.9	.26	2.30	47	.48	0	2.71
05	COMMAND	0.33	PPI	.4	.01	2.74	44	.43	0	2.34
	SENCOR	0.18	PRE							
06	COMMAND	0.33	PPI	.4	.23	2.78	48	.46	0	2.59
	BASAGRAN	0.50	EPO							
07	SENCOR	0.18	PRE	0	.06	2.77	45	.45	0	2.62
	BASAGRAN	0.50	EPO							
08	TREFLAN	0.50	PPI	.2	4.60	2.66	38	.44	8.5	2.44
	BASAGRAN	0.50	EPO							
09	BASAGRAN	0.500	EPO	0	.88	3.46	47	.43	0	2.60
	RAMROD	5.00	PRE							
10	TREFLAN	0.50	PPI	.2	4.85	2.78	38	.44	0	2.54
	RAMROD	5.00	PRE							
11	TREFLAN	0.50	PPI	.2	4.88	3.17	45	.43	.1	2.58
	DUAL	2.00	PRE							
12	BASAGRAN	0.50	EPO	0	0	2.72	51	.47	.8	2.80
	DUAL	2.00	PRE							
	LSD (0.05) =			.2	.82	.98	35	.07	5.2	.43
	STD DEV =			.1	.57	.68	25	.05	3.6	.29
	C V =			54.0	43.17	24.46	11	10.76	405.1	11.08

OFF-STATION TRIAL # 3

O R E G O N S T A T E U N I V E R S I T Y

ALTERNATIVES TO DINOSEB IN PEA PRODUCTION

** SET 1 OF 1 **	APPLIC. 1	APPLIC. 2	APPLIC. 3	APPLIC. 4
GEN. APPLIC. TYPE	PPI	PRE	POST 1	POST 2
APPLICATION DATE	05/03/89	05/03/89	05/22/89	06/09/89
JULIAN DATE/YEAR	J123/89	J123/89	J142/89	J160/89
START HR / END HR	09:00/10:00	12:10/01:10	04:00/05:00	05:30/06:00
APPLIC. METHOD				
AIR/SOIL TEMP (F)	59 / 59	66 / 64	68 / 76	68 / 71
% REL. HUMIDITY	67	59	42	61
WIND DIR. / VELOC	/	W / 5	/ 0	N / 2
SKY / SOIL COND.	H.O. /FINE	P.CLD/FINE	P.CLD/	CLEAR/DRY
SOIL/LEAF MOIST.	MST /	DRY /	DRY /	DRY / DRY
INCORP. EQUIPMENT	ROTOTILLER			
INCORP. DEPTH(in)	3	0	0	0
SPRAYER TYPE	UNICYCLE	UNICYCLE	UNICYCLE	UNICYCLE
SPRAYER GPA / PSI	22.68 / 30	22.68 / 0	30 / 0	0 / 0
MIX SIZE (Gallon)	0.125	0.125	0.125	0.125
NOZZLE TYPE /NUM.	8003-5	8003-5	8003-5	8003-5

OFF-STATION TRIAL # 3

TRT.	PESTICIDE			PEAS %INJURY	CHEAL %CONTRL	PEAS %INJURY	CHEAL %CONTRL	P.HVST # STEMS	P.HRVST TONS/A
NO.	NAME	LBai/A	TYPE	5/22/89	5/22/89	6/02/89	6/02/89	7/18/89	7/18/89
01	CHECK			0	0	0	0	41	1.85
02	COMMAND	0.25	PPI	0	80	0	73	36	2.49
03	COMMAND	0.33	PPI	0	79	0	74	43	2.55
04	COMMAND	0.50	PPI	0	86	0	83	51	2.98
05	COMMAND	0.33	PPI	0	96	0	91	45	2.57
	SENCOR	0.18	PRE						
06	COMMAND	0.33	PPI	0	83	0	75	40	2.51
	BASAGRAN	0.50	EPOST						
07	SENCOR	0.18	PRE	0	31	0	40	51	2.47
	BASAGRAN	0.50	EPOST						
08	TREFLAN	0.50	PPI	0	94	0	86	46	2.79
	BASAGRAN	0.50	EPOST						
09	BASAGRAN	0.500	EPOST	0	70	0	70	47	2.30
	RAMROD	5.00	PRE						
10	TREFLAN	0.50	PPI	0	98	0	96	44	2.76
	RAMROD	5.00	PRE						
11	TREFLAN	0.50	PPI	0	98	0	96	47	2.93
	DUAL	2.00	PRE						
12	BASAGRAN	0.50	EPOST	0	75	0	70	46	2.57
	DUAL	2.00	PRE						
	LSD(0.05) =			NA	17	NA	17	9	.74
	S DEVIATION =			NA	12	NA	12	6	.51
	COEFARIABILITY =			NA	16	NA	17	14	19.90

Weed Control Alternatives in Snap Bean Production

Dan Curtis, R. D. William, G. Crabtree,
Horticulture Department, Oregon State University
Dan McGrath, Marion County Extension

Introduction

Recent shifts in the weed control program associated with snap bean production have resulted in use of herbicide combinations that achieve processor standards for weed contamination through additive control of problem weeds. Weed skips of particularly troublesome weeds such as hairy nightshade and redroot pigweed have occurred. In addition, preplant incorporated treatments of pendimethalin have seriously injured beans. Research during two seasons identified 2 diphenyl ether herbicides from the soybean market which looked promising in snap beans. Unfortunately, neither company wished to proceed with registration for snap beans.

To supplement current programs, research strategies in 1989 focused on possible use of 2 marginally acceptable diphenyl ether herbicides, acifluorfen and oxyfluorfen, along with postemergence treatments of Basagran under cool conditions, and Prowl applied preemergence.

Field trials were established at 5 sites in 1989; 4 with grower-cooperators and 1 at the OSU Vegetable Research Farm. Silt loams with 5-15% clay contents, 1.89% OM (trial 2) and 2.75% OM (trial 3) were prevalent at 2 grower sites (trials 2 and 3), whereas silty clay loams with 27-40% clay contents, 2.59% OM (trial 1) and 5.18% OM (trial 4) were evident at sites 1 and 4. The OSU farm contains a silty clay loam with 30-40% clay content and 5-10% OM. Tables 1-5 display treatments, average crop injury ratings, weed control ratings and harvest yields. All treatments received Treflan preplant incorporated at trial 1, Eptam preplant incorporated to all treatments at trial 2, and a combination of both Treflan and Eptam preplant incorporated at trials 3 and 4.. Treatments at the OSU Vegetable Research Farm are as indicated.

Discussion

Preemergence Treatments:

Acifluorfen applied preemergence controlled pigweed (AMARE) and groundsel (SENVU) at the 2 sites with the greater clay contents, Tables 1 and 4. Unfortunately, unacceptable crop injury occurred along with relatively poor weed control at sites with less clay content, Tables 2 and 3. Bean symptoms were noted that delayed growth and development, but failed to exhibit any physical distortions or chlorosis. Yields appeared normal although harvest would have been delayed by approximately 2 weeks.

Oxyfluorfen applied as a preemergence band between rows provided selective control of pigweed, groundsel and shepherds purse (CAPBU), Tables 1-3, except where the herbicide overlapped within the bean row in trial 4, Table 4. Precision banding requires that nozzles be attached to the planter.

Prowl applied preemergence improved crop selectivity compared to preplant incorporation at the OSU site, Table 5. Prowl controlled nightshade (SOLSA) and wild mustard (BRSNI) 80-100%. Groundsel, however, was not controlled although yields were similar in the presence of this weed. At this site the Eptam/ Treflan/ chloramben combination resulted in higher yields than the Eptam/ Treflan/ Dual combination, although stunting was evident early in the season and mustard pressure probably reduced yields in the latter treatment.

Postemergence Treatments:

Acifluorfen applied postemergence caused intial severe leaf injury to the crop in all trials except at site 1, Tables 1-4. Symptoms, however, were negligible after three weeks. Yields were similar with these treatments. Grounsel was controlled with a combination of Eptam preplant incorporated/ acifluorfen postemergence, Table 3, but was marginal with Treflan preplant incorporated/acifluorfen preemergence, Table 1. Pigweed control was excellent with these treatments, including removal of 8-inch pigweed with a postemergence spray of acifluorfen.

Basagran treatments were inconsistent in groundsel control, Table 1 and 3. Shepherds purse was controlled at trial 3 with all Basagran treatments. While addition of Dash (a BASF proprietary blend of surfactants) improved weed control slightly, UAN 32 failed to improve control, Tables 2, 3, and 4. Yields with Basagran were erratic in trial 1, while rate increases from 0.5 lbs. ai/acre to 1.0 lbs. ai/acre did not improve weed control.

Directed sprays of acifluorfen reduced visual injury considerably, tables 3 and 4. Yields were similar to acifluorfen used postemergence.

Directed sprays of oxyfluorfen, while not drastically reducing yields, dramatically damaged bean foliage. However, weed control was excellent, Tables 3 and 4.

Conclusions

Acifluorfen applied preemergence caused unacceptable stunting at the sites containing scant clay, probably due to its water solubility. We plan to continue work towards registration of a postemergence or directed spray of acifluorfen for snap beans. Oxyfluorfen applied as a preemergence band will also be pursued, but nozzles must be mounted on the planter. Future plans also include continued testing of oxyfluorfen as a postemergence directed spray with an emphasis on spray timing of the sprays.

Basagran controlled mustard weeds, but pigweed escaped treatments at all rates. Dash seemed to improve performance of Basagran slightly. herbicide.

Label changes should be considered for Prowl to improve crop safety and weed control using preemegence treatments. Tank mixes with Dual could improve broad spectrum control with a single application.

Table 1 Crop Injury, Weed Control and Yield Averages From OFF-STATION TRIAL # 1 (PEORIA)

TRT. NO.	PESTICIDE NAME	RATE	TYPE	BEANS % INJRY 6/05/89	BEANS % INJRY 6/26/89	SENVU % CNTRL 6/26/89	BEANS % INJRY 7/10/89	SENVU % CNTRL 7/10/89	YIELD T/A 8/02/89
01	ACIFLUORFEN	0.125	POST	0	0	0	1	5	5.84
02	ACIFLUORFEN	0.25	POST	1	1	0	3	13	5.69
03	ACIFLUORFEN	0.50	PRE	1	1	100	3	100	6.23
04	ACIFLUORFEN	1.00	PRE	1	3	100	4	100	6.64
05	OXYFLUORFEN AMIBEN	0.25 2.25	BNDBR BNDOR	0	0	99	0	99	5.99
06	OXYFLUORFEN AMIBEN	0.50 2.25	BNDBR BNDOR	4	5	99	20	100	5.60
07	BASAGRAN	0.50	POST	1	0	0	0	0	5.81
08	BASAGRAN COC	0.50	POST	0	0	0	0	0	4.22
09	BASAGRAN UAN32 COC	0.50	POST POST	0	4	0	3	5	4.76
10	BASAGRAN	1.00	POST	0	1	0	4	10	5.72
11	BASAGRAN COC	1.00	POST	0	1	0	4	10	3.56
12	BASAGRAN UAN32 COC	1.00	POST POST	1	3	0	0	5	6.40
13	CONTROL			0	0	0	0	0	5.75
	LSD(0.05) =			3	4	1	12	17	2.4

[z] COC = crop oil concentrate, a BASF proprietory mixture, was added to treatments where indicated at 1.00 quart per acre.
[y] Dash = BASF surfactant, added to treatments where noted at a rate of 1.00 quart per acre.
[x] PPI = Pre-plant incorporated application.
[w] PRE = Preemergence application.
[v] POST = Postemergence application.
[u] BNDBR = Banded between rows application.
[t] BNDOR = Banded over rows application.

ALTERNATIVES TO DINOSEB IN SNAP BEAN PRODUCTION 1989

PROJECT TYPE (H/I etc): I PROJECT NO.:OSUHBN029 TRIAL ID.:BNF01-89
CITY/COUNTY:BENTON (PEORIA ROAD) ST:OR ZIP: COUNTRY:USA
RESEARCH BY:CRTS,WLLM,RCKHM,IRVN LAST UPDATE:12/10/33 INITIATED:05/20/89
COOPERATOR :HAMLIN FARMS EXPT. STATUS:C COMPLETED:08/02/89
REPORTED BY:D.CURTIS,J.IRVINE RELATED FILE:BNF02-89 SOURCE:R. HAMLIN

PREVIOUS CROP:BEANS PLOT / Ft:8 x30 ROW WIDTH/In:24
PREVIOUS TILL: SOIL TEXTURE: MALABON SCL OM%:2.59
CEC:0 %SAND:12 %SILT:82 %CLAY:6 pH:5.8

PREVIOUS TRT.:TREFLAN,DINITRO EXPT. DESIGN:RCBD
FERTILIZER :11-34-20-6 (450 LB/ACRE) NUM. OF REPS:4
MISC. INFO. :PLANTED W/24" ROWS GERM @ 84% REPORT TYPE:FINAL

CROP:SNAP BEANS VARIETY:OR91G
PLANTING DATE:05/20/89 DEPTH/In:2" SPACING/In:2"/PLT NUM.PLANTS:
HARVEST DATE :08/02/89 SEASONAL RAINFALL DURING EXPERIMENT
RESIDUE TAKEN:N EARLY: MID: LATE:

** SET 1 OF 1 **	APPLIC. 1	APPLIC. 2
GEN. APPLIC. TYPE	PRE & BANDS	POST
APPLICATION DATE	05/20/89	06/26/89
JULIAN DATE/YEAR	J140/89	J177/89
START HR / END HR	14:00/16:30	12:00/01:00
APPLIC. METHOD	BRDC/BD	BRDCST
AIR/SOIL TEMP (F)	71 / 76	72 / 82
% REL. HUMIDITY	68	52
WIND DIR. / VELOC	N / 04	NW / 6
SKY / SOIL COND.	CLEAR/0-2CD	PCLDY/-
SOIL/LEAF MOIST.	DRY / -0-	DRY / DRY
INCORP. EQUIPMENT		
INCORP. DEPTH(in)	0	0
SPRAYER TYPE	COMP-AIR	UNI/COMPAIR
SPRAYER GPA / PSI	22.68 / 30	22.68 / 30
MIX SIZE (Gallon)	0.125	0.125
NOZZLE TYPE /NUM.	8003/8002E	8003/5
RAINFALL/IRRIG.in		
0-24 HR/1-3 DAYS	/	/
4-7 DAYS/2ND WEEK	/	/
3RD WEEK/4TH WEEK	/	/

	SPECIE CODE	SPECIES	APPLIC. 1 DEN./STG.	APPLIC. 2 DEN./STG.
	*******	****** CROP ******	*********	*********
		beans	/pre	/2ndtr
	*******	****** PEST ******	*********	*********
1		groundsel	/	/ 6in

Table 2 Crop Injury, Weed Control and Yield Averages From OFF-STATION TRIAL # 2 (GRAND ISLAND)

TRT. NO.	PESTICIDE NAME	RATE	TYPE	BEANS % INJRY 7/06/89	AMARE % CNTRL 7/06/89	BEANS % INJRY 7/26/89	AMARE % CNTRL 7/26/89	YIELD TONS/A 8/04/89
01	ACIFLUORFEN + X77 @ 0.25% V/V	0.125	POST	0	0	4	89	7.74
02	ACIFLUORFEN + X77 @ 0.25% V/V	0.25	POST	1	0	10	93	6.59
03	ACIFLUORFEN	0.50	PRE	30	93	28	88	4.22
04	ACIFLUORFEN	1.00	PRE	73	98	58	97	1.47
05	OXYFLUORFEN AMIBEN	0.25 2.25	BNDBR BNDOR	1	92	0	91	6.63
06	OXYFLUORFEN AMIBEN	0.50 2.25	BNDBR BNDOR	5	93	3	96	6.92
07	BASAGRAN	0.50	POST	0	25	0	50	6.36
08	BASAGRAN COC	0.50 0.25	POST POST	0	13	0	51	6.67
09	BASAGRAN COC UAN32	0.50 0.25 1.00	POST POST POST	0	20	4	70	6.24
10	BASAGRAN	1.00	POST	0	0	0	66	5.65
11	BASAGRAN COC	1.00 0.25	POST POST	0	0	1	55	6.05
12	BASAGRAN COC UAN32	1.00 0.25 1.00	POST POST POST	0	0	3	53	5.72
13	DUAL BASAGRAN	2.00 0.50	PRE POST	0	94	0	98	7.38
14	AMIBEN	2.25	PRE	4	98	3	100	6.72
15	CONTROL			0	0	0	0	4.19
			LSD(0.05) =	6	40	8	26	1.40

RESEARCH BY:WILLIAM,CURTIS,MGRTH LAST UPDATE:12/10/33 INITIATED:06/01/89
COOPERATOR :CRAIG COLEMAN EXPT. STATUS:C COMPLETED:08/04/89
REPORTED BY:D.CURTIS,J.IRVINE RELATED FILE:BNF01-89 SOURCE:

PREVIOUS CROP:CORN PLOT / Ft:8 x30 ROW WIDTH/In:30
PREVIOUS TILL: SOIL TEXTURE:NEWBERG SILTLOAM OM%:1.89
CEC:0 %SAND:17 %SILT:72 %CLAY:11 pH:6.0

PREVIOUS TRT.: EXPT. DESIGN:RCBD
FERTILIZER : NUM. OF REPS:4
MISC. INFO. : REPORT TYPE:final

CROP:SNAP BEANS VARIETY:OSU 91-G
PLANTING DATE:05/31/89 DEPTH/In:1.5 SPACING/In: NUM.PLANTS:
HARVEST DATE :08/04/89 SEASONAL RAINFALL DURING EXPERIMENT
RESIDUE TAKEN:n EARLY: MID: LATE:

3.50 LBS AI EPTAM applied to all treatments
x-77 surfactant was added to Blazer treatments at 1/400 v/v

** SET 1 OF 1 **	APPLIC. 1	APPLIC. 2
GEN. APPLIC. TYPE	PRE&BND O/B	POST
APPLICATION DATE	06/01/89	07/06/89
JULIAN DATE/YEAR		
START HR / END HR	14:30/16:30	12:30/01:30
APPLIC. METHOD	BRD/BND	BRDCST
AIR/SOIL TEMP (F)	90 / 85	79 / 72
% REL. HUMIDITY	35	42
WIND DIR. / VELOC	N / 05	SW / 07
SKY / SOIL COND.	CLEAR/0-3CD	CLEAR/-0-
SOIL/LEAF MOIST.	DRY / -0-	MST / DRY
INCORP. EQUIPMENT	water-2/3in	
INCORP. DEPTH(in)	0	0
SPRAYER TYPE	UNI/BI CAIR	UNI/COMPAIR
SPRAYER GPA / PSI	22.68 / 0	22.68 / 30
MIX SIZE (Gallon)	0.125	0.125
NOZZLE TYPE /NUM.	8003/8003E	8003/5

Table 3 Crop Injury, Weed Control and Yield Averages From OFF-STATION TRIAL # 3

TRT. NO.	PESTICIDE NAME	LBai/A	TYPE	BEANS % INJRY 7/24/89	SENVU % CNTRL 7/24/89	CAPBP % CNTRL 7/24/89	BEANS % INJRY 8/14/89	TOTALYD T/ACRE 8/21/89
01	ACIFLUORFEN + X77 @ 0.25% V/V	0.125	POST	5	89	88	0	9.04
02	ACIFLUORFEN + X77 @ 0.25% V/V	0.25	POST	13	93	96	3	9.07
03	ACIFLUORFEN + X77 @ 0.25% V/V	0.25	POSTD	0	0	0	0	9.18
04	ACIFLUORFEN	0.50	PRE	10	86	94	3	6.98
05	ACIFLUORFEN	1.00	PRE	41	93	100	13	4.18
06	OXYFLUORFEN	0.25	BNDBR	0	66	68	0	9.68
	AMIBEN	2.25	BNDOR					
07	OXYFLUORFEN	0.50	BNDBR	0	93	93	0	9.95
	AMIBEN	2.25	BNDOR					
08	OXYFLUORFEN	0.125	POSTD	0	0	0	10	7.78
09	OXYFLUORFEN	0.25	POSTD	0	0	0	29	10.08
10	BASAGRAN	0.50	POST	6	89	95	0	10.54
11	BASAGRAN	0.50	POST	8	94	96	1	9.45
	DASH	0.25	POST					
12	BASAGRAN	0.50	POST	9	91	95	4	9.56
	DASH	0.25	POST					
	UAN32	1.00	POST					
13	BASAGRAN	1.00	POST	9	93	96	0	10.39
14	BASAGRAN	1.00	POST	10	96	96	1	8.09
	DASH	0.25	POST					
15	BASAGRAN	1.00	POST	10	93	98	1	10.23
	DASH	0.25	POST					
	UAN32	1.00	POST					
16	DUAL	2.00	PRE	1	84	98	0	9.33
	BASAGRAN	0.500	POST					
17	AMIBEN	2.25	PRE	9	93	96	1	8.33
18	CONTROL			0	0	0	0	9.01
		LSD(0.05) =		3	16	16	8	2.20

CITY/COUNTY:SIDNEY,MARION ST:OR ZIP: COUNTRY:USA
RESEARCH BY:WILLIAM,CURTIS,MGRTH LAST UPDATE:12/16/33 INITIATED:06/20/89
COOPERATOR :KREBS FARMS EXPT. STATUS:C COMPLETED:08/21/89
REPORTED BY:D.CURTIS,J.IRVINE RELATED FILE:BNF01-89 SOURCE:

PREVIOUS CROP: PLOT / Ft:8 x30 ROW WIDTH/In:30
PREVIOUS TILL: SOIL TEXTURE:CLOQUATO SILTLO OM%:2.75
CEC:0 %SAND:8 %SILT:92 %CLAY:0 pH:6.0

PREVIOUS TRT.: EXPT. DESIGN:RCBD
FERTILIZER : NUM. OF REPS:4
MISC. INFO. :TREFLAN AND EPTAM APPLIED TO ALL TMT REPORT TYPE:FINAL

CROP:SNAP BEANS VARIETY:OSU 91-G
PLANTING DATE:06/20/89 DEPTH/In: SPACING/In: NUM.PLANTS:
HARVEST DATE :08/21/89 SEASONAL RAINFALL DURING EXPERIMENT
RESIDUE TAKEN:N EARLY: MID: LATE:

** SET 1 OF 1 **	APPLIC. 1	APPLIC. 2	APPLIC. 3
GEN. APPLIC. TYPE	PRE	POST	POST D
APPLICATION DATE	06/20/89	07/18/89	07/28/89
JULIAN DATE/YEAR	J171/89	J199/89	J209/89
START HR / END HR	04:15/06:15	03:00/03:45	10:45/11:05
APPLIC. METHOD	BND/BRD	BRDCST	DIRECTD
AIR/SOIL TEMP (F)	78 / 80	80 / 86	76 / 70
% REL. HUMIDITY	39	65	70
WIND DIR. / VELOC	NW / 06	- / 0	NE / 03
SKY / SOIL COND.	CLEAR/	PCLDY/0-2CL	CLEAR/ -0-
SOIL/LEAF MOIST.	D-M / -0-	M-D / DRY	M-D / DRY
INCORP. EQUIPMENT	FINGER WDER		-0-
INCORP. DEPTH(in)	1.00	0	0
SPRAYER TYPE	UNI/COMPAIR	UNI/COMPAIR	UNI/CO2
SPRAYER GPA / PSI	22.68 / 30	22.68 / 30	36.30 / 30
MIX SIZE (Gallon)	0.125	0.125	0.125
NOZZLE TYPE /NUM.	8003/8003E	8003/5	8004/2

Table 4 Crop Injury, Weed Control and Yield Averages From OFF-STATION TRIAL # 4 (IRISH BEND)

TRT. NO.	PESTICIDE NAME	LBai/A	TYPE	BEANS %INJURY 8/23/89	AMARE %CONTRL 8/23/89	TOTALYD T/ACRE 9/06/89
01	ACIFLUORFEN + X77 @ 0.25% V/V	0.125	POST	10	81	10.45
02	ACIFLUORFEN + X77 @ 0.25% V/V	0.25	POST	12	94	10.75
03	ACIFLUORFEN + X77 @ 0.25% V/V	0.25	POSTD	6	91	9.34
04	ACIFLUORFEN	0.50	PRE	3	83	10.67
05	ACIFLUORFEN	1.00	PRE	9	88	9.13
06	OXYFLUORFEN AMIBEN	0.25 2.25	BNDBR BNDOR	24	92	6.83
07	OXYFLUORFEN AMIBEN	0.50 2.25	BNDBR BNDOR	33	100	8.51
08	OXYFLUORFEN	0.125	POSTD	64	80	7.87
09	OXYFLUORFEN	0.250	POSTD	73	97	6.78
10	BASAGRAN	0.50	POST	0	41	9.26
11	BASAGRAN DASH	0.50 0.25	POST POST	3	58	11.27
12	BASAGRAN DASH UAN32	0.50 0.25 1.00	POST POST POST	7	38	10.91
13	BASAGRAN	1.00	POST	3	50	10.53
14	BASAGRAN DASH	1.00 0.25	POST POST	5	49	9.96
15	BASAGRAN DASH UAN32	1.00 0.25 1.00	POST POST POST	10	43	10.61
17	DUAL BASAGRAN	2.00 0.50	PRE POST	0	100	10.06
18	AMIBEN	2.25	PRE	1	98	10.59
19	CHECK			0	15	9.00
			LSD(0.05) =	14	35	2.95

```
PROJECT TYPE (H/I etc): H   PROJECT NO.:BNF03-89        TRIAL ID.:
CITY/COUNTY:MARION                  ST:OR   ZIP:            COUNTRY:USA
RESEARCH BY:WILLIAM,CURTIS,MGRTH    LAST UPDATE:          INITIATED:  /  /
COOPERATOR : HORNING FARMS          EXPT. STATUS:C        COMPLETED:  /  /
REPORTED BY:D.CURTIS,J.IRVINE       RELATED FILE:BNF01-89 SOURCE:

PREVIOUS CROP: PEAS                 PLOT / Ft:8    x30    ROW WIDTH/In:0
PREVIOUS TILL:                      SOIL TEXTURE: SILT LOAM      OM%:5.18
                          CEC:0     %SAND:29  %SILT:66  %CLAY:5  pH:6.0

PREVIOUS TRT.:Dual                                       EXPT. DESIGN:RCBD
FERTILIZER   :                                           NUM. OF REPS:4
MISC. INFO.  :                                           REPORT TYPE:INTERIM

CROP:SNAP BEANS              VARIETY:OSU 91G
PLANTING DATE:06/27/89  DEPTH/In:       SPACING/In:30"        NUM.PLANTS:
HARVEST DATE :09/06/89            SEASONAL RAINFALL DURING EXPERIMENT
RESIDUE TAKEN:                    EARLY:       MID:       LATE:
```

** SET 1 OF 1 **	APPLIC. 1	APPLIC. 2	APPLIC. 3
GEN. APPLIC. TYPE	PRE&BANDS	POST D	POST
APPLICATION DATE	06/27/89	08/08/89	08/08/89
JULIAN DATE/YEAR	J178/89	J220/89	J220/89
START HR / END HR	12:30/01:30	11:00/11:20	11:20/01:00
APPLIC. METHOD	UNI/BIC	UNICO2	UNICAIR
AIR/SOIL TEMP (F)	64 / 79	78 / 72	78 / 72
% REL. HUMIDITY	60	66	66
WIND DIR. / VELOC	-0 / 00	N / 05	N / 05
SKY / SOIL COND.	HOVRC/FINE	PCLDY/OK	CLEAR/GOOD
SOIL/LEAF MOIST.	D-M / -0-	D-M / -0-	D-M / DRY
INCORP. EQUIPMENT			
INCORP. DEPTH(in)	0	0	0
SPRAYER TYPE	BRD-U/BND-B	DIRECTED	BROADCAST
SPRAYER GPA / PSI	22.68 / 30	22.68 / 30	22.68 / 30
MIX SIZE (Gallon)	0.125	0.125	0.125
NOZZLE TYPE /NUM.	8003/8003E	8004 * 2	8003 * 5

Table 5 Crop Injury, Weed Control and Yield Averages From OSU VEGETABLE RESEARCH FARM, CORVALLIS OREGON

TRT. NO.	PESTICIDE NAME	LBai/A	TYPE	BEANS %INJURY 6/05/89	SOLSA % CNTRL 7/10/89	BRSNI % CNTRL 7/10/89	SENVU % CNTRL 7/10/89	TOTALYD T/ACRE 8/03/89
01	CONTROL			0	0	0	0	1.36
02	PROWL	1.50	PPI	16	40	50	0	.97
03	PROWL	0.75	PRE	0	64	60	20	4.69
04	PROWL	1.125	PRE	3	84	83	46	6.21
05	PROWL	1.50	PRE	0	84	85	46	7.28
06	PROWL	3.00	PRE	0	100	100	74	7.69
07	TREFLAN	0.75	PPI	3	97	38	94	5.82
	EPTAM	3.50	PPI					
	DUAL	2.00	PRE					
08	TREFLAN	0.75	PPI	8	99	99	78	7.05
	EPTAM	3.50	PPI					
	AMIBEN	2.25	PRE					
		LSD(0.05) =		8	9	11	26	1.56

[z] COC = crop oil concentrate, a BASF proprietory mixture, was added to treatments where indicated at 1.00 quart per acre.

[y] Dash = BASF surfactant, added to treatments where noted at a rate of 1.00 quart per acre.

[x] PPI = Pre-plant incorporated application.

[w] PRE = Preemergence application.

[v] POST = Postemergence application.

[u] BNDBR = Banded between rows application.

[t] BNDOR = Banded over rows application.

O R E G O N S T A T E U N I V E R S I T Y

SOIL APPLIED ACIFUORFEN IN SNAP BEAN PRODUCTION, 1989

PROJECT TYPE (H/I etc): H PROJECT NO.:3954 TRIAL ID.:89:OR:005
CITY/COUNTY:CORVALLIS LINN ST:OR ZIP:97331 COUNTRY:USA
RESEARCH BY:WILLIAM, CURTIS LAST UPDATE:11/04/33 INITIATED:07/20/89
COOPERATOR :OSU VEG FARM-HOPSON EXPT. STATUS: COMPLETED:10/04/89
REPORTED BY:CURTIS RELATED FILE:**NONE** SOURCE:

PREVIOUS CROP:POTATOES PLOT / Ft:8 x30 ROW WIDTH/In:36
PREVIOUS TILL: SOIL TEXTURE:VARIABLE OM%:0
CEC:0 %SAND:0 %SILT:0 %CLAY:0 pH:0.0

PREVIOUS TRT.: EXPT. DESIGN:RCBD
FERTILIZER : NUM. OF REPS:4
MISC. INFO. :DYFONATE FOR SYMPHLUM CONTROL REPORT TYPE:FINAL

CROP:SNAP BEANS VARIETY:OSU 91-G
PLANTING DATE:07/19/89 DEPTH/In:2" SPACING/In:1.5" NUM.PLANTS:
HARVEST DATE :10/04/89 SEASONAL RAINFALL DURING EXPERIMENT
RESIDUE TAKEN:Y EARLY: MID: LATE:

PRIMARY RATE UNIT:LBai/A RATE UNIT [B]: RATE UNIT [C]:

** SET 1 OF 1 **	APPLIC. 1	APPLIC. 2
GEN. APPLIC. TYPE	PRE	CRACKING
APPLICATION DATE	07/20/89	07/25/89
JULIAN DATE/YEAR	J201/89	J206/89
START HR / END HR	03:30/04:30	01:30/01:50
APPLIC. METHOD	BRDCST	BRDCST
AIR/SOIL TEMP (F)	79 / 74	82 / 84
% REL. HUMIDITY	56	58
WIND DIR. / VELOC	SW / <5	NE / <8
SKY / SOIL COND.	OVCST/1"CLD	CLEAR/CRSTY
SOIL/LEAF MOIST.	DRY / -	DRY / DRY
INCORP. EQUIPMENT	WATER	WATER
INCORP. DEPTH(in)	0	0
SPRAYER TYPE	COMPAIR/UNI	COMPAIR/UNI
SPRAYER GPA / PSI	22.68 / 30	22.68 / 30
MIX SIZE (Gallon)	0.125	0.125
NOZZLE TYPE /NUM.	8003/5@18"	8003/5@18"
RAINFALL/IRRIG.in		
0-24 HR/1-3 DAYS	.67 /	1.25 /
4-7 DAYS/2ND WEEK	/	/
3RD WEEK/4TH WEEK	/	/

O R E G O N S T A T E U N I V E R S I T Y

SOIL APPLIED ACIFUORFEN IN SNAP BEAN PRODUCTION, 1989

EXPT. LOCATION:CORVALLIS LINN, OR 97331 USA
RESEARCH BY:WILLIAM, CURTIS INITIATED:07/20/89 COMPLETED:10/04/89

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	BEANS %INJURY 9/27/89	SOLSA %CONTRL 9/27/89	BEANS LBS/5' 10/04/*	BEANS TONS/A 10/04/*
01	BLAZER	SC	2.00 0.34	PRE	4	61	6.67	9.69
02	BLAZER	SC	2.00 0.50	PRE	6	53	6.05	8.78
03	BLAZER	SC	2.00 1.00	PRE	5	80	6.05	8.78
04	BLAZER	SC	2.00 0.50	EPOST	4	46	6.15	8.93
05	BLAZER	SC	2.00 1.00	EPOST	9	78	5.34	7.76
06	CONTROL				0	0	5.40	7.84
				LSD(0.05) =	12	33	2.10	3.05
				STANDARD DEVIATION =	8	22	1.39	2.02
				COEFF. OF VARIABILITY =	172	42	23.42	23.43

PENDIMETHALIN USE IN SNAP BEANS

PROJECT TYPE (H/I etc): H PROJECT NO.:OSUHBN01-89 TRIAL ID.:BN89VF-01
CITY/COUNTY:CORVALLIS\LINN ST:OR ZIP:97331 COUNTRY:USA
RESEARCH BY:CURTIS/WILLIAM LAST UPDATE:12/10/33 INITIATED:05/16/89
COOPERATOR :OSU VEG RES FARM EXPT. STATUS: COMPLETED: / /
REPORTED BY:CURTIS RELATED FILE:**NONE** SOURCE:S. ROBBINS

PREVIOUS CROP:FALLOW PLOT / Ft:8 x30 ROW WIDTH/In:36
PREVIOUS TILL: SOIL TEXTURE:CHEHALIS SCL OM%:3.3
CEC:0 %SAND:0 %SILT:0 %CLAY:0 pH:6.5

PREVIOUS TRT.: EXPT. DESIGN:RCBD
FERTILIZER :450/A 12-29-10-7 NUM. OF REPS:4
MISC. INFO. :DYFONATE @ 2LBS ACTIVE/ACRE REPORT TYPE:FINAL

CROP: VARIETY:OSU 91G
PLANTING DATE:05/16/89 DEPTH/In:1.5 SPACING/In:1.5 36"ROW NUM.PLANTS:
HARVEST DATE : / / SEASONAL RAINFALL DURING EXPERIMENT
RESIDUE TAKEN:N EARLY: MID: LATE:

** SET 1 OF 1 **	APPLIC. 1	APPLIC. 2
GEN. APPLIC. TYPE	PPI	PRE
APPLICATION DATE	05/16/89	05/17/89
JULIAN DATE/YEAR	J136/89	J137/89
START HR / END HR	03:00/03:45	03:00/04:00
APPLIC. METHOD	BRDCST	BRDCST
AIR/SOIL TEMP (F)	72 / 76	50 / 65
% REL. HUMIDITY	53	86
WIND DIR. / VELOC	W / 08	W / 7
SKY / SOIL COND.	PCLDY/SCLOD	CLDY /-
SOIL/LEAF MOIST.	DRY / -	WET / -
INCORP. EQUIPMENT	ROTERA	RAIN 0.4IN
INCORP. DEPTH(in)	3	0
SPRAYER TYPE	CO2 BACKPAK	UNI/COMPAIR
SPRAYER GPA / PSI	22.68 / 35	22.68 / 30
MIX SIZE (Gallon)	0.125	0.125
NOZZLE TYPE /NUM.	8003/5	8003/5
RAINFALL/IRRIG.in		
0-24 HR/1-3 DAYS	/	.29 / .11
4-7 DAYS/2ND WEEK	/	.20 / .80
3RD WEEK/4TH WEEK	/	/

Alternatives to Dinoseb in Snap Bean Production - Line Source - Water Activation Study 1989.

Dan Curtis, William Braunworth Jr., G. Crabtree, R. D. William
Oregon State University, Department of Horticulture.

A line-source irrigation technique was used to establish water gradients to observe effects of differing amounts of herbicide activation water on 12 weed control treatments listed in table 1. Activation water was applied in two timings, 24 hours after herbicide application and 2 weeks following herbicide application. Activation water was measured during application and divided into 5 levels ranging from 1 inch down to 0 inches. Herbicide treatments were applied perpendicular to the activation line in 8 x 50 ft. plots. These plots were divided into sub-plots with length dependent on amount of activation water received. Each herbicide treatment was replicated 4 times for a total of 480 plots (12 weed control treatments x 5 activation water levels x 2 activation water timings x 4 replications = 480 plots). Average weed control ratings (percent control in relation to the weedy checks) for redroot pigweed and hairy nightshade are presented from 2 observation periods, 3 weeks following planting and at time of harvest.

OSU 91-G bush beans were planted parallel to the activation line on 7/12/89 following incorporation of herbicides. Preemergence treatments were applied on 7/13/89. First incorporation line was run on 7/14/89. the second activation (to a second set of identical treatments, planted and with herbicides applied at the same time as activation 1) was run on 7/28/89. Block 1 was harvested on 9/19/89, blocks 2 and 3 on 9/20/89 and block 4 on 9/21/89.

Percent weed control rating averages are displayed in tables 2-5. Yield averages are displayed in table 6.

Figures 1-4 illustrate water application amounts in relation to distance from the source.

Table 1

Treatment List

treatment		rate(LBai/A)	Application type
1	clean check		
2	Cobra	0.25	preemergence
3	Pursuit	0.062	preemergence
4	Pursuit	0.062	preplant inc.
5	Dual	2.00	preemergence
6	Dual	2.00	preplant inc.
7	Dual	2.00	pre. scratch inc.
8	Treflan	0.75	preplant inc.
	Eptam	3.50	preplant inc.
	Dual	2.00	preemergence
9	Pursuit	0.062	preemergence
	Dual	2.00	preemergence
10	Cobra	0.25	preemergence
	Eptam	3.50	preplant inc.
11	Cobra	0.25	preemergence
	Dual	2.00	preemergence
12	weedy check		

Table 2

% Control of Hairy Nightshade with Herbicides and With Activation Water at Five Levels (Ratings Taken During Fourth Week) Water Applied at Two Timings

WATER APPLICATION TIMING	Water-inches applied	Weeded Check	Cobra PRE	Pursuit PRE	Pursuit PPI	Dual PRE	Dual PPI	Dual PRES	Treflan Eptam, Dual PPI/PPI/PRE	Pursuit Dual PRE/PRE	Cobra Eptam PPI/PRE	Cobra Dual PRE	Check
24 HOURS	0.8-1.0	100	91	93	88	97	66	81	100	98	99	100	0
	0.5-0.8	100	91	85	80	73	62	55	99	98	100	99	0
	0.2-0.5	100	91	87	87	65	65	42	99	87	100	100	0
	.06-0.2	100	88	46	83	42	75	20	98	79	99	99	0
	0.0-.06	100	83	27	76	47	66	16	97	62	100	100	0
2 WEEKS	0.8-1.0	100	99	63	87	67	83	72	97	83	100	99	0
	0.5-0.8	100	99	46	81	65	78	51	94	73	100	100	0
	0.2-0.5	100	97	16	72	33	63	23	87	51	100	99	0
	.06-0.2	100	98	41	88	50	58	35	91	51	100	99	0
	0.0-.06	100	98	53	88	72	72	46	97	76	100	100	0

Table 3

% Control of Redroot Pigweed With Herbicides and With Activation Water at Five Levels (Ratings Taken During Fourth Week) Water Applied at Two Timings

	Water-Inches applied	Weeded Check	Cobra PRE	Pursuit PRE	Pursuit PPI	Dual PRE	Dual PPI	Dual PRES	Treflan Eptam, Dual PPI/PPI/PRE	Pursuit Dual PRE/PRE	Cobra Eptam PPI/PRE	Cobra Dual PRE	Check
WATER APPLICATION TIMING	24 HOURS	0.8-1.0	100	100	98	97	99	73	88	100	98	100	100	0
		0.5-0.8	100	98	99	80	93	67	73	100	99	100	100	0
		0.2-0.5	100	99	96	88	78	77	80	100	96	100	100	0
		.06-0.2	100	99	80	97	77	96	67	100	97	100	100	0
		0.0-.06	100	75	85	93	80	92	71	100	90	100	100	0
	2 WEEKS	0.8-1.0	100	100	66	78	70	85	61	99	88	100	100	0
		0.5-0.8	100	100	55	78	52	75	41	99	80	100	100	0
		0.2-0.5	100	99	40	81	52	86	31	99	60	100	100	0
		.06-0.2	100	100	73	90	86	100	49	99	69	100	100	0
		0.0-.06	100	99	73	97	88	95	57	100	85	100	100	0

Table 4

% Control of Hairy Nightshade With Herbicides With Activation Water at Five Levels
(Ratings Taken at Time of Harvest)
Water Applied at Two Timings

WATER APPLICATION TIMING	Water-Inches applied	Weeded Check	Cobra PRE	Pursuit PRE	Pursuit PPI	Dual PRE	Dual PPI	Dual PRES	Treflan Eptam, Dual PPI/PPI/PRE	Pursuit Dual PRE/PRE	Cobra Eptam PPI/PRE	Cobra Dual PRE	Check
24 HOURS	0.8-1.0	82	88	93	90	94	76	86	100	98	100	100	0
	0.5-0.8	70	77	87	82	90	76	71	97	97	100	100	0
	0.2-0.5	68	87	81	83	70	63	67	97	88	99	98	0
	.06-0.2	71	85	67	72	58	57	56	90	81	96	97	0
	0.0-.06	67	73	37	65	57	60	46	82	81	98	98	0
2 WEEKS	0.8-1.0	85	91	76	86	70	78	55	91	78	100	99	0
	0.5-0.8	86	97	70	91	72	72	67	88	67	99	99	0
	0.2-0.5	80	90	60	71	62	65	43	83	53	100	97	0
	.06-0.2	77	90	57	66	66	70	56	86	60	100	98	0
	0.0-.06	76	90	62	78	71	68	56	87	67	96	78	0

Table 5

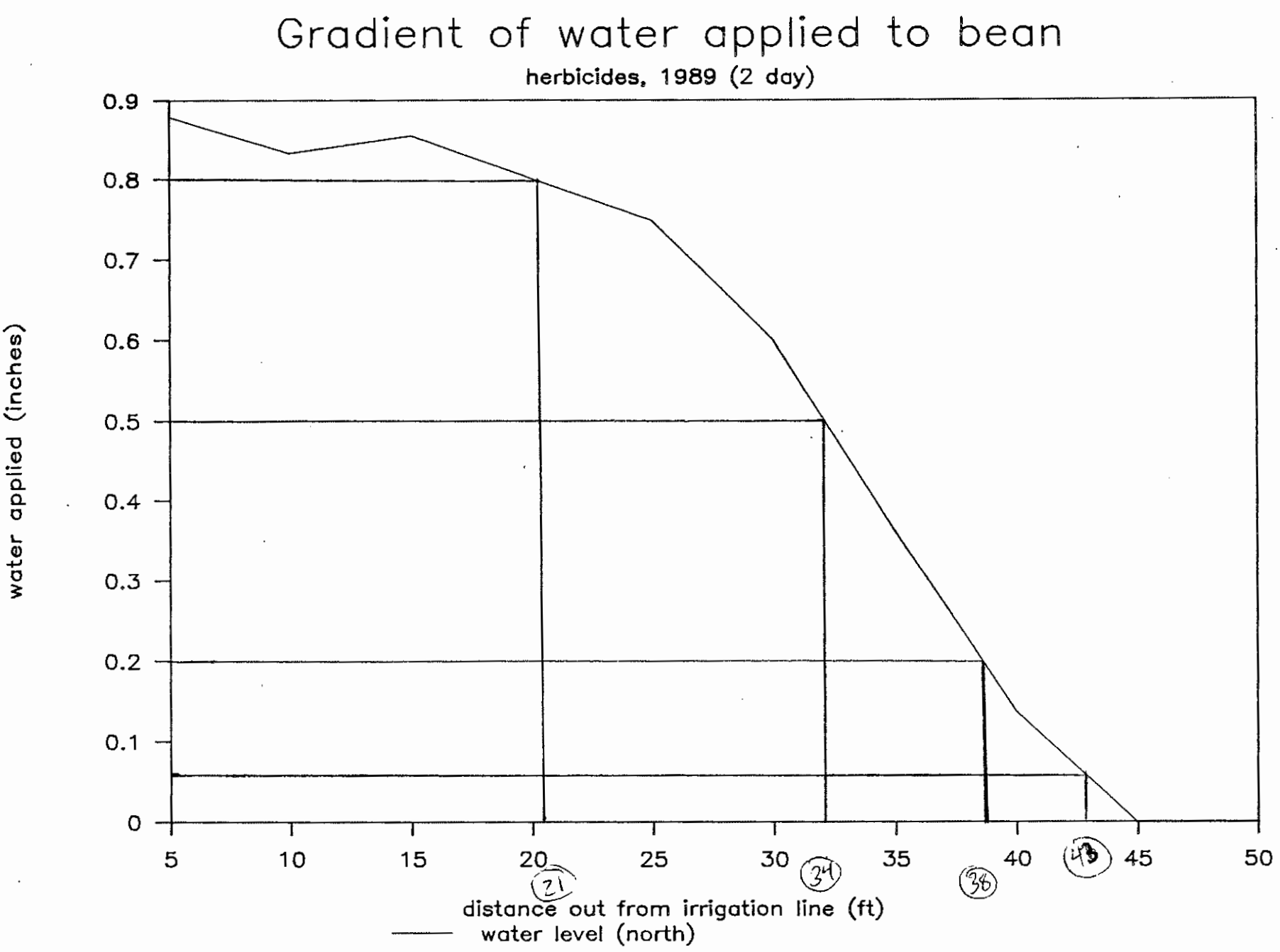
% Control of Redroot Pigweed With Herbicides With Activation Water at Five Levels (Ratings Taken at Time of Harvest) Water Applied at Two Timings

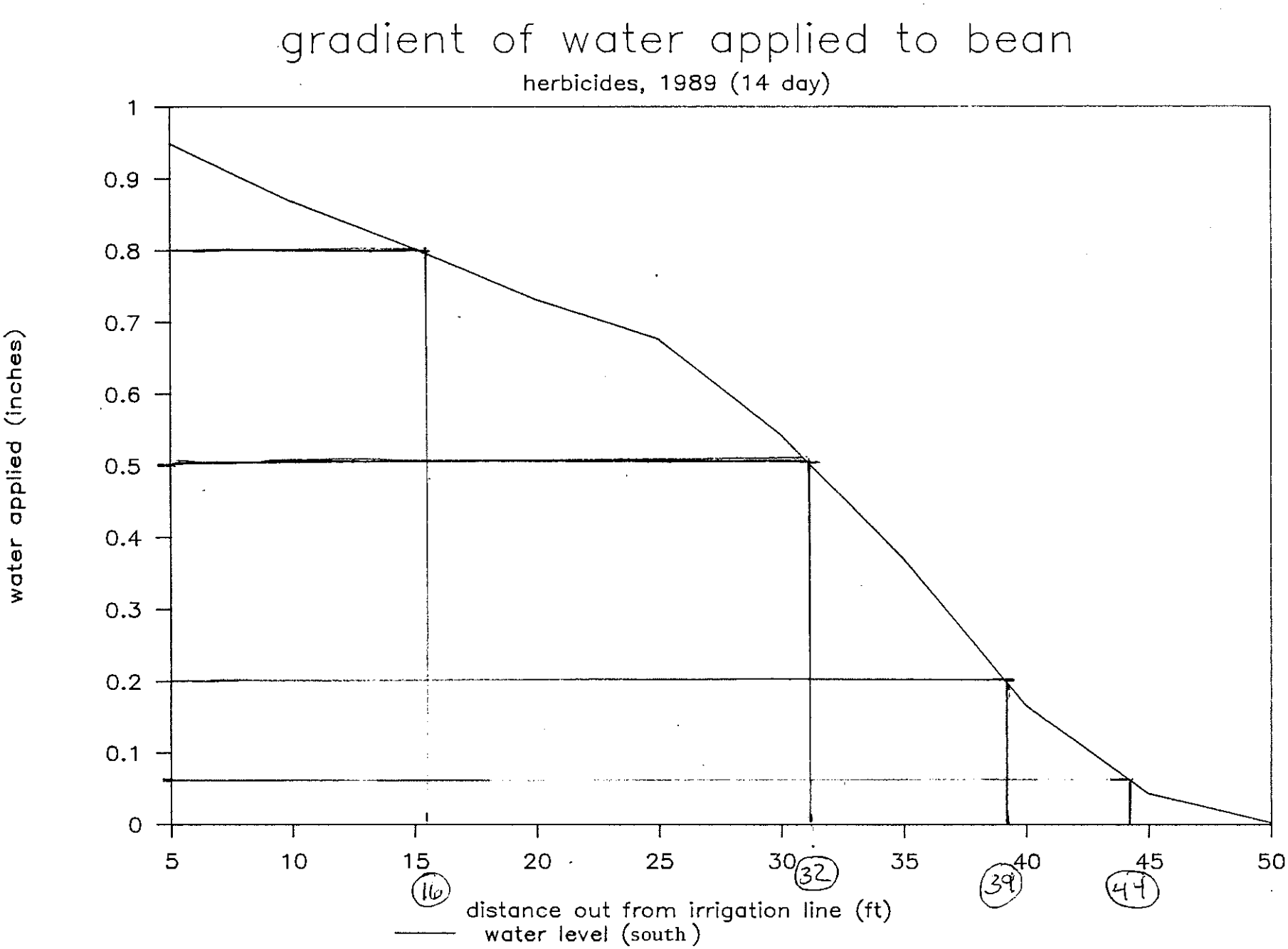
WATER APPLICATION TIMING	Water-Inches applied	Weeded Check	Cobra PRE	Pursuit PRE	Pursuit PPI	Dual PRE	Dual PPI	Dual PRES	Treflan Eptam, Dual PPI/PPI/PRE	Pursuit Dual PRE/PRE	Cobra Eptam PPI/PRE	Cobra Dual PRE	Check
24 HOURS	0.8-1.0	83	100	93	93	96	80	84	100	98	100	100	0
	0.5-0.8	78	99	97	82	96	83	82	100	100	100	100	0
	0.2-0.5	72	98	100	86	88	67	82	100	98	100	100	0
	.06-0.2	72	96	83	80	82	71	76	98	100	100	100	0
	0.0-.06	63	85	67	76	80	82	61	100	97	100	100	0
2 WEEKS	0.8-1.0	87	100	65	85	66	71	35	100	86	100	100	0
	0.5-0.8	90	100	55	81	72	80	46	86	75	100	100	0
	0.2-0.5	87	99	67	86	68	87	38	96	72	100	100	0
	.06-0.2	90	100	77	84	83	91	55	97	82	100	98	0
	0.0-.06	90	92	77	95	92	77	62	91	82	98	76	0

Table 6

Projected Average Yield of Beans Using Herbicides With Activation Water at Five Levels
Tons Per Acre
Water Applied at Two Timings

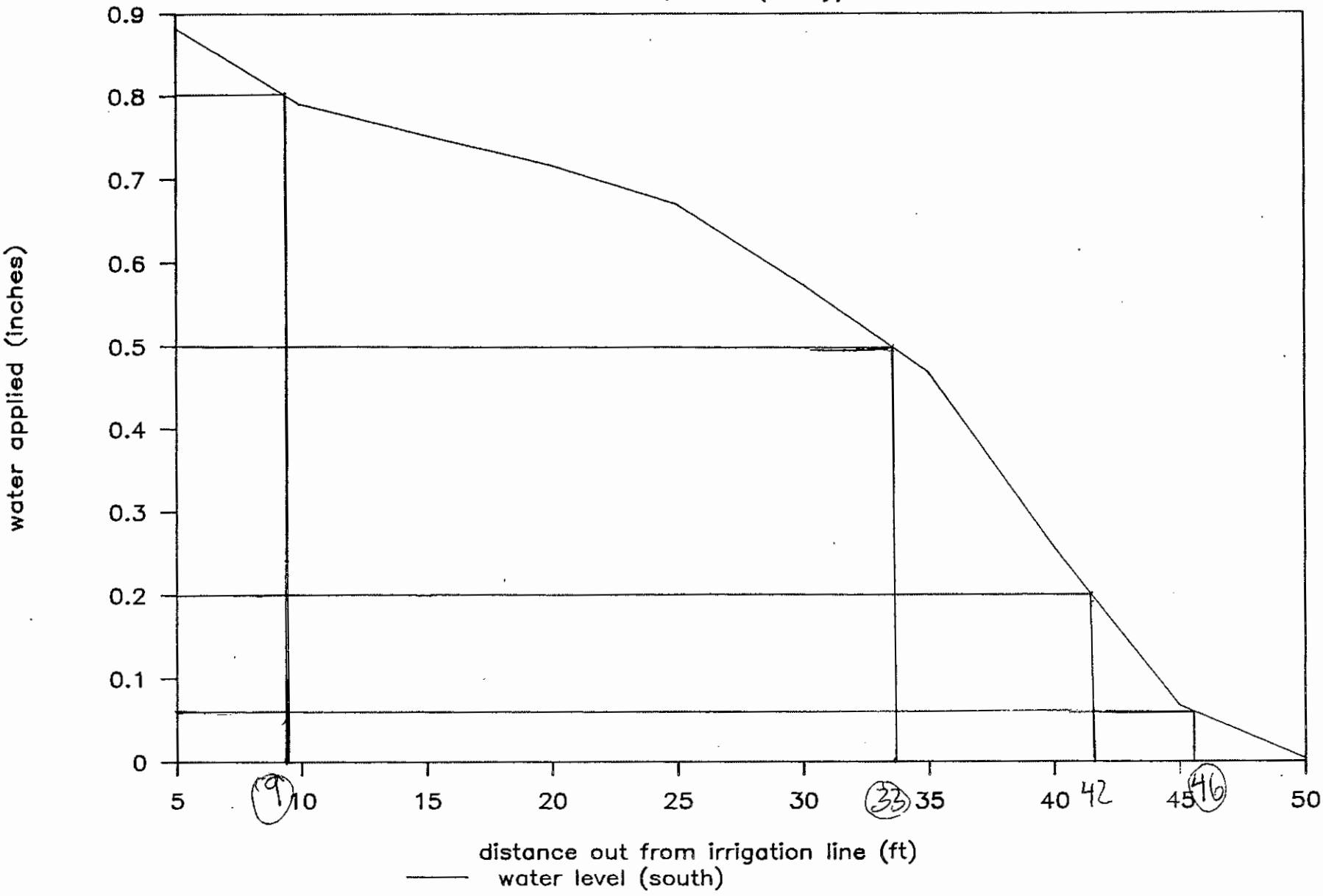
WATER APPLICATION TIMING	Water-Inches applied	Weeded Check	Cobra PRE	Pursuit PRE	Pursuit PPI	Dual PRE	Dual PPI	Dual PRES	Treflan Eptam, Dual PPI/PPI/PRE	Pursuit Dual PRE/PRE	Cobra Eptam PPI/PRE	Cobra Dual PRE	Check
24 HOURS	0.8-1.0	7.8	8.4	7.7	8.4	6.8	6.1	7.9	7.4	8.5	8.1	8.7	4.6
	0.5-0.8	8.0	9.4	8.6	8.2	9.4	8.7	8.4	9.7	8.7	9.5	9.1	5.5
	0.2-0.5	6.6	8.1	8.6	8.6	7.4	7.3	7.7	9.5	8.5	9.1	8.1	6.5
	.06-0.2	5.6	7.6	6.1	7.9	5.7	7.2	4.8	8.0	7.5	9.6	8.1	4.5
	0.0-.06	5.1	6.8	5.9	8.1	6.1	6.9	4.7	8.3	6.8	7.8	7.6	3.9
2 WEEKS	0.8-1.0	7.4	9.3	7.5	8.9	8.4	7.6	7.5	9.6	8.7	8.4	9.3	6.4
	0.5-0.8	6.0	7.8	6.2	6.9	6.9	5.9	5.7	7.1	6.4	8.3	8.7	5.0
	0.2-0.5	5.7	7.9	5.0	6.7	6.9	6.0	6.2	8.0	5.5	9.3	8.9	4.1
	.06-0.2	6.1	7.5	5.6	6.7	7.1	5.4	7.2	7.2	6.6	9.3	8.1	4.7
	0.0-.06	6.9	8.7	6.8	8.2	7.6	6.7	6.7	6.2	7.8	8.4	8.2	5.1

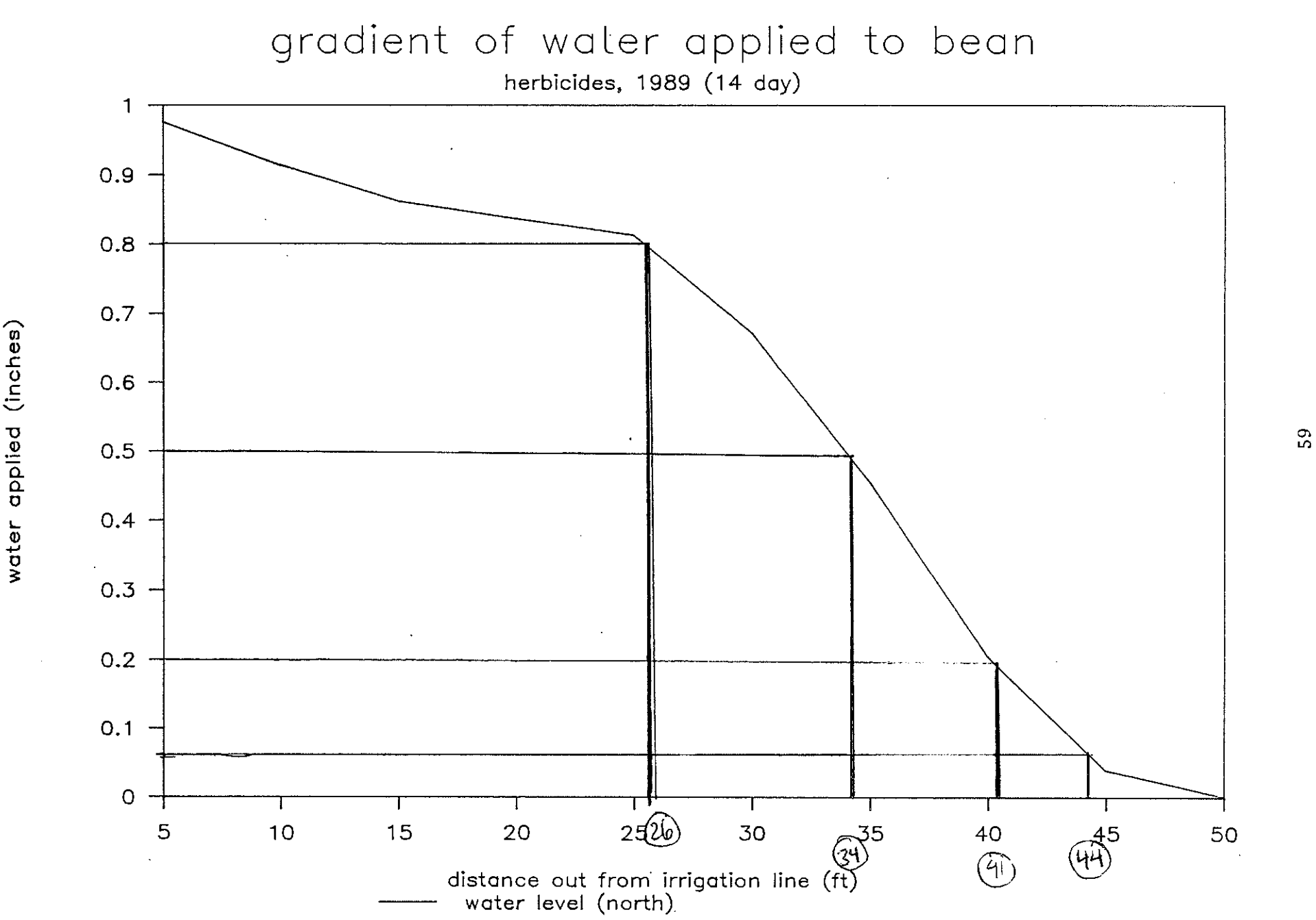

Gradient of water applied to bean
herbicides, 1989 (2 day)
water applied (inches)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
5
10
15
20
25
30
35
40
45
50
21
34
36
distance out from irrigation line (ft)
water level (north)


gradient of water applied to bean
herbicides, 1989 (14 day)
water applied (inches)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
5
10
15
20
25
30
35
40
45
50
16
32
39
44
distance out from irrigation line (ft)
water level (south)

Gradient of water applied to bean

herbicides, 1989 (2 day)




gradient of water applied to bean
herbicides, 1989 (14 day)
water applied (inches)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
5
10
15
20
25
26
30
34
35
40
41
44
45
50
distance out from irrigation line (ft)
water level (north)

Assessment of Value of Aqueous Nitrogen Fertilizer Solutions as Fertilizer and Herbicide Supplement in Broccoli

Garvin Crabtree
N.S. Mansour
Department of Horticulture
Oregon State University

A recent resurgence of interest in the use of non-specific materials with contact activity as herbicides includes fertilizer solutions on broccoli. A degree of selectivity is obtained through differential wetting of waxy broccoli leaves and the leaves of some weed species.

Objectives of this study were to (1) determine the potential selective herbicidal activity of three nitrogen-containing fertilizer solutions, and (2) compare broccoli response to nitrogen applied in these foliar sprays to equal amounts of nitrogen applied in the usual form of side-dressed fertilizer.

Two plantings of broccoli 'Gem', seeded on April 12 and 28, 1989 were established on Chehalis sandy loam soil at the Horticulture Research Farm, Corvallis, OR. Fertilizer (18N, 44P, 15K and 10S - lbs. per acre) was broadcast and soil incorporated prior to planting. The early and late plantings of broccoli were thinned on May 5 and 24, 1989, respectively, to leave plants spaced at 9 inches in the rows (rows spaced 18 inches apart). On May 16, 1989 when the first planting was in the 5-leaf stage and the second planting had 1 to 3 leaves (designated as 2-leaf stage), liquid fertilizer sprays were applied. Treatments used are shown in the table. Sprays were either broadcast (BRO) to give complete, uniform coverage over appropriate test plots or applied as a directed (DIR) spray so that the fertilizer sprays covered the area between rows and the crop plant row was avoided. Plots were evaluated on May 19, 1989 (early rating) for weed control and crop response. Subsequently, all plots were uniformly cultivated and weeded check plots were hand weeded. Evaluations of general weed control (ALL WEEDS) and crop response were made on June 21 and June 28, 1989, prior to harvest, for the April 12 and April 28, 1989 plantings, respectively.

On June 26, 1989, various amounts of ammonium nitrate was applied as a side dressing fertilizer to result in a total N application of 208 lbs per acre. Cultivation following on the same day served to incorporate the fertilizer, as well as to control weeds between the broccoli rows. Plots were harvested (primarily center heads) on three separate dates for each planting. Harvest numbers and weights of each planting were combined for the total yield for each plot. Somewhat lower yields for the second planting reflect a slightly advanced harvest schedule as compared to the first planting.

Results, as shown in the table, confirm findings of the 1988 field study. Weed control is variable between species and incomplete, so that additional control measures are needed to supplement the effect of nitrogen fertilizer sprays. Application method (broadcast or directed) of the fertilizer sprays generally had little influence on their weed control effectiveness. Although this study was not designed for a precise comparison of timing of the sprays,

this factor was important, with the earlier application (broccoli 2-leaf stage) often giving higher weed control ratings. With the considerable variability present in these data there is no clear preference among treatment materials or combinations. As was found in 1988, AN-20 appeared to have the most effect on weeds and crop when compared to equal gallonage applications of other materials. The combination of AN-20 and ammonium thiosulfate was essentially as effective in controlling weeds as AN-20 alone.

Broccoli injury ratings (leaf necrosis and growth reduction) were usually consistent between the early (soon after application of the fertilizer sprays) and late (just before first harvest) evaluation dates and even though crop injury was not readily apparent from a casual inspection at harvest, closer study showed evidence of leaf necrosis and reduced growth. There was also a strong inverse relationship between injury ratings and yield with the highest injury ratings and lowest yields resulting from the broadcast applications over the second planting.

In this study, there was no significant difference in broccoli production when part of the nitrogen fertilizer was applied as a directed spray as compared to an equal amount of N applied as a side dressing of ammonium nitrate.

SUMMARY

In a comparison of nitrogen fertilizer spray treatments, the best control of weed species was obtained when applications were made to small weeds (broccoli 2-leaf stage). Using a directed spray to minimize contact with the crop plants resulted in the least crop injury and the best broccoli yields. There was not much difference between the various materials used as fertilizer spray treatments but slightly more herbicidal activity was observed in the AN-20 plots. Crop response to this material was satisfactory if the applications were made as directed spray; in the broadcast spray treatments, more crop safety was exhibited if combinations of AN-20 and ammonium thiosulfate or AN-20 and Solution-32 were used.

Oregon broccoli growers should be able to incorporate information obtained from this project into their production practices. Use of fertilizer sprays as a supplementary weed control measure should result in lower production costs/greater broccoli yields/improved product quality.

WEED CONTROL IN BROCCOLI - 1989

No.	Fertilizer	Appln Rate (Gal/Acre)	Type[1] of Appln	Broc Stage	Weed Control (%)[2] BRSRA/ RAPRA	SOLSA	SPRAR	MATMT/ ANTCO	CAPBP	ALL WEEDS	Broccoli Injury Rating (%) early	late	Yield No. of Heads	Tons/Acre
1	AN-20	60	BRO	5-LF	38	50	7	24	45	55	6	20	37	2.0
				2-LF		93	31			66	24	11	24	1.9
2	AN-20	90	BRO	5-LF	56	73	39	45	83	76	13	15	37	2.7
				2-LF		93	23			54	39	15	20	1.3
3	AN-20	60	DIR	5-LF	46	60	24	28	56	75	10	8	37	2.3
				2-LF		63	10			100	3	10	29	3.1
4	AN-20	90	DIR	5-LF	31	33	15	19	39	68	5	20	39	2.7
				2-LF		93	31			66	24	11	35	3.3
5	Ammonium thiosulfate	60	BRO	5-LF	43	49	15	18	65	60	6	11	36	2.4
				2-LF		70	8			63	16	8	19	1.3
6	Ammonium thiosulfate	90	BRO	5-LF	34	50	5	34	50	65	8	14	34	2.3
				2-LF		91	30			74	20	18	22	1.5
7	Ammonium thiosulfate	60	DIR	5-LF	36	45	9	18	55	45	8	13	34	2.4
				2-LF		58	5			100	1	16	30	2.7
8	Ammonium thiosulfate	90	DIR	5-LF	56	73	31	34	74	74	11	13	34	2.3
				2-LF		80	28			100	8	18	30	2.6
9	Solution-32	60	BRO	5-LF	29	50	20	26	58	60	9	8	38	2.5
				2-LF		71	8			51	11	18	22	1.7
10	Solution-32	90	BRO	5-LF	31	49	18	18	55	54	3	20	38	2.2
				2-LF		75	8			50	16	14	19	1.3
11	Solution-32	60	DIR	5-LF	35	60	17	35	64	73	6	11	37	2.5
				2-LF		39	1			96	6	14	27	2.4
12	Solution-32	90	DIR	5-LF	24	43	20	31	55	70	1	9	37	2.5
				2-LF		40	3			98	3	10	34	3.0
13	AN-20	30}	BRO	5-LF	35	63	19	30	50	64	4	19	31	1.9
	Amm-thio	30}		2-LF		83	6			71	18	10	27	2.2

14	AN-20	45)	BRO	5-LF	30	40	13	28	50	74	5	5	38	2.6
	Amm-thio	45)		2-LF		84	30			78	20	13	17	1.5
15	AN-20	30)	DIR	5-LF	35	63	19	30	50	64	4	5	39	2.7
	Amm-thio	30)		2-LF		63	3			79	5	9	25	2.4
16	AN-20	45)	DIR	5-LF	25	35	6	15	33	63	3	15	34	1.7
	Amm-thio	45)		2-LF		66	5			100	1	10	31	2.5
17	Soultion-32	30)	BRO	5-LF	28	40	18	23	47	74	4	8	35	2.7
	Amm-thio	30)		2-LF		76	5			76	14	5	24	2.3
18	Solution-32	45)	BRO	5-LF	38	53	27	28	55	64	6	13	38	2.5
	Amm-thio	45)		2-LF		48	1			58	6	13	23	1.6
19	Solution-32	30)	DIR	5-LF	48	64	12	30	69	66	1	14	33	2.3
	Amm-thio	30)		2-LF		55	0			98	4	6	30	2.8
20	Solution-32	45)	DIR	5-LF	30	50	11	20	45	44	3	16	37	2.1
	Amm-thio	45)		2-LF		61	1			95	6	11	29	2.2
21	Weeded Check	---	---	5-LF	8	13	4	9	20	53	0	6	32	2.1
				2-LF		3	0			81	1	13	28	2.7
22	Unweeded Check	---	---	5-LF	14	15	5	10	11	61	1	9	34	2.5
				2-LF		0	0			93	0	1	34	3.9
	LSD (0.05)			5-LF	27	35	22	25	34	26	9	14	7	0.8
				2-LF		25	29			23	14	14	7	1.2

[1] Type of Application: BRO = broadcast, uniform application over plot
DIR = directed, application between crop rows

[2] Weed Control Rating: Visual evaluation of % control (stand and growth), individual species - early, ALL WEEDS - late
Weed species abbreviations - BRSRA = birdsrape mustard
RAPRA = wild radish
SOLSA = nightshade
SPRAR = corn spurry
NATMT = pineapple weed
ANTCO = mayweed chamomile
CAPBP = shepherdspurse

Lentagran for Weed Control in Cabbage and Broccoli

Garvin Crabtree and Steve Eskelsen
Department of Horticulture
Oregon State University

Details of trial establishment and results are given in the accompanying tables. Additional information is as follows:

This trial was conducted at the Oregon State University Horticulture Research Farm near Corvallis, Oregon. Soil was a Chehalis sandy loam (Cumulic Ultic Haploxeroll). Trifluralin was applied (Applic. 1) to the total area and soil incorporated prior to planting cabbage seed. Seedings were thinned to approximately one-foot spacing in the rows.

SUMMARY OF RESULTS

Weed densities were very high in this field trial and yields in all other treatments were significantly lower than yields from the hand weeded check. Cabbage yields were significantly better than in the unweeded checks in all treatments except #1 (Lentagran 0.67 lbs ai/A, post emergence), #5 (Lentagran 0.90 lbs ai/A, plus Poast 0.25 lbs ai/A, plus crop oil concentrate, postemergence), #7 (Dual 3.63 lbs ai/A, pre-emergence) and, #9 (Dual 3.63 lbs ai/A, pre-emergence, plus Lentagran 0.90 lbs ai/A, postemergence). Injury symptoms from herbicide applications were also apparent for a few weeks after the postemergence sprays were applied, but at harvest any lasting response from this source could not be separated from weed interference effects. The typical, early Lentagran injury symptoms on cabbage did not persist. The most Lentagran injury symptoms appeared in plots with combination treatments, such as the tank mix of Lentagran, Poast and crop oil concentrate, or a pre-emergence application of Dual followed by Lentagran postemergence.

As might be expected, weeds in the *Brassicaceae* family (wild radish, birdsrape mustard, and shepherd's purse) were the most difficult to control selectively in cabbage. Some resistance to control with Lentagran was also observed for common groundsel and lesser snapdragon. Lambsquarters and mayweed chamomile were controlled quite well with this herbicide.

Results from this trial suggest that early postemergence applications, when the cabbage has 1-2 true leaves, should be emphasized and that reduced application rates for Lentagran should be considered. Later applications, or late components of split applications, should be tried with directed sprays if a favorable crop-weed differential can be established.

O R E G O N S T A T E U N I V E R S I T Y

PYRIDATE IN CABBAGE PRODUCTION 1989

PROJECT TYPE (H/I etc): H PROJECT NO.: TRIAL ID.:
CITY/COUNTY:Corvallis/Benton ST:OR ZIP:97331 COUNTRY:USA
RESEARCH BY:Garvin Crabtree LAST UPDATE: 9/30/33 INITIATED:05/15/89
COOPERATOR : EXPT. STATUS: COMPLETED: / /
REPORTED BY:Steve Eskelsen RELATED FILE:**NONE** SOURCE:

PREVIOUS CROP:Potatoes PLOT / Ft:6 x22 ROW WIDTH/In:
PREVIOUS TILL: SOIL TEXTURE: OM%:
CEC: %SAND: %SILT: %CLAY: pH:

PREVIOUS TRT.: EXPT. DESIGN:RCBD
FERTILIZER :(198 LB N, 43 LB P, 15 LB K, 10 LB S)/ A NUM. OF REPS:4
MISC. INFO. : REPORT TYPE:INTERIM

CROP:Cabbage VARIETY: Head Start
PLANTING DATE:05/15/89 DEPTH/In:.75 SPACING/In:3 NUM.PLANTS:
HARVEST DATE :08/04/89 SEASONAL RAINFALL DURING EXPERIMENT
RESIDUE TAKEN: EARLY: MID: LATE:

PRIMARY RATE UNIT:LBai/A RATE UNIT (B): RATE UNIT (C):

EXPERIMENT COMMENTS

APPLY 0.5 LBS. A.I./ACRE TRIFLURALIN (TREFLAN) PPI TO ALL BEDS.

POST-EMERGENCE TIMINGS:
EPOST= (EARLY POST) 2-LEAF STAGE OF CABBAGE
POST= 3 TO 4 LEAF STAGE OF CABBAGE
LPOST= (LATE POST) 5 TO 6 LEAF STAGE OF CABBAGE

PREEM treatments were applied before cabbage had any true leaves
EPOST treatments were applied when cabbage had 1-5 true leaves
POST treatments-leaf number not written down
LPOST treatemts sprayed when cabbage was a 7 leaves. Weeds had multiple leaves and were from 4-12 inches high.

PYRIDATE IN CABBAGE PRODUCTION 1989

** SET 1 OF 1 **	APPLIC. 1	APPLIC. 2	APPLIC. 3	APPLIC. 4	APPLIC. 5
GEN. APPLIC. TYPE	PPI	PRE	EPOST	POST	LPOST
APPLICATION DATE	05/04/89	05/19/89	05/31/89	06/06/89	06/13/89
JULIAN DATE/YEAR	J124/89	J139/89	J151/89	J157/89	J164/89
START HR / END HR	: / :	11:00/11:30	02:30/03:00	10:00/10:30	10:00/10:30
APPLIC. METHOD	Spray	Spray	Spray	Spray	Spray
AIR/SOIL TEMP (F)	/	93 / 79	77 / 78	81 / 75	70 / 86
% REL. HUMIDITY		60	37	48	60
WIND DIR. / VELOC	/	N / 05	N / 05	SW / 5	SE / 5
SKY / SOIL COND.	/	PartC/	clear/dry	cloud/moist	cloud/dry
SOIL/LEAF MOIST.	/	/	/	/	/
INCORP. EQUIPMENT	Rotera&roll				
INCORP. DEPTH(in)	3	0	0	0	0
SPRAYER TYPE	large boom	Unicycle	Unicycle	Unicycle	Unicycle
SPRAYER GPA / PSI	20.62 /	22.68 / 30	20.62 / 30	20.62 / 30	20.62 / 30
MIX SIZE (Gallon)	.0625	.125	.0625	.0625	.0625
NOZZLE TYPE /NUM.		8004/4	8003/4	8003/4	8003/4
RAINFALL/IRRIG.in					
0-24 HR/1-3 DAYS	/	0 / 0	0 / 0	0 / .66	0 / 0
4-7 DAYS/2ND WEEK	/	.85 / .66	.66 / .66	.3 / .99	0 / .99
3RD WEEK/4TH WEEK	/	.66 / 0	.3 / 0	0 / 0	0 / .99

	SPECIE CODE	SPECIES	APPLIC. 1 DEN./STG.	APPLIC. 2 DEN./STG.	APPLIC. 3 DEN./STG.	APPLIC. 4 DEN./STG.	APPLIC. 5 DEN./STG.
	*******	****** CROP ******	*********	*********	*********	*********	*********
			/	/	/	/	/
	*******	****** PEST ******	*********	*********	*********	*********	*********
1	WRADMS	*Raphanus sp. / Brassica rapa*	/	/	/	/	/
2	SHPURS	*Capsella bursa-pastoris*	/	/	/	/	/
3	GRNDSL	*Senecio vulgaris*	/	/	/	/	/
4	NGHTSHD	*Solanum sp.*	/	/	/	/	/
5	OVALLWC	*All species*	/	/	/	/	/
6	LESSNAP	*Antirrhinum orontium*	/	/	/	/	/
7	LMBSQTR	*Chenopodium album*	/	/	/	/	/
8	MAYWEED	*Anthemis cotula*	/	/	/	/	/
9			/	/	/	/	/
	UNIFORM STANDARD TREATMENT						
	UNIFORM TRT. RATE AND UNIT						

FILE NAME:GCCAB-89.EXP INTERIM PRINTED:10/11/89

O R E G O N S T A T E U N I V E R S I T Y

PYRIDATE IN CABBAGE PRODUCTION 1989

EXPT. LOCATION:Corvallis/Benton, OR 97331 USA
RESEARCH BY:Garvin Crabtree INITIATED:05/15/89 COMPLETED: / /

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	CABBAGE %INJURY 6/16/89	TRAD/MS %CONTRL 6/16/89	SUPURS %CONTRL 6/16/89	GRNDSL %CONTRL 6/16/89	WGHTSHD %CONTRL 6/16/89	OVALLWC %CONTRL 6/16/89	CABBAGE %INJURY 6/28/89	MUSTRAD %CONTRL 6/28/89	LESSNAP %CONTRL 6/28/89	WGHTSHD %CONTRL 6/28/89	LMBSQTR %CONTRL 6/28/89
01	LENTGRAN	WP 45%	0.67	POST	10	18	34	35	58	53	10	48	38	66	75
02	LENTGRAN	WP 45%	0.90	POST	9	30	45	51	83	70	11	50	65	85	88
03	LENTGRAN	WP 45%	0.45	EPOST	3	29	40	30	88	66	5	56	33	76	94
04	LENTGRAN	WP 45%	0.45	POST	13	18	45	33	70	53	19	69	48	88	70
	LENTGRAN	WP 45%	0.45	LPOST											
05	LENTGRAN	WP 45%	0.90	POST	19	18	33	38	65	58	25	45	55	45	90
	POAST	EC 1.50	0.25	POST											
	C.O.C.	EC 1.00	0.25	POST											
06	LENTGRAN	WP 45%	0.90	POST	6	15	35	88	84	65	10	50	60	89	98
	STINGER	EC 3.00	0.25	POST											
07	DUAL	EC 8.00	3.63	PREEM	8	5	30	38	55	43	8	40	88	38	68
08	DUAL	EC 8.00	3.63	PREEM	18	43	71	95	93	83	30	66	85	91	100
	LENTGRAN	WP 45%	0.90	POST											
09	DEVRINOL	WP 50%	1.80	PREEM	1	3	9	80	20	21	5	25	76	5	85
10	DEVRINOL	WP 50%	1.80	PREEM	11	51	50	65	93	74	24	63	95	73	100
	LENTGRAN	WP 45%	0.90	POST											
11	HNDWDCHK				0	100	100	100	100	100	0	100	100	100	100
12	CONTROL				0	0	5	30	8	5	13	8	33	10	60
				LSD(0.05) =	6	27	35	48	27	16	11	20	40	30	28
				STANDARD DEVIATION =	4	19	24	33	19	11	8	14	27	20	19
				COEFF. OF VARIABILITY =	53	68	58	59	27	19	58	26	43	32	23

FILE NAME:GCCAB-89.EXP INTERIM PRINTED:10/11/89

O R E G O N S T A T E U N I V E R S I T Y

PYRIDATE IN CABBAGE PRODUCTION 1989

EXPT. LOCATION:Corvallis/Benton, OR 97331 USA
RESEARCH BY:Garvin Crabtree INITIATED:05/15/89 COMPLETED: / /

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	MAYWEED %CONTRL 6/20/89	GRNDSEL %CONTRL 6/20/89	SHEPURS %CONTRL 6/20/89	HARVEST LBS/PLT 8/04/89	HARVEST LBS/A 8/04/89	HARVEST T/A 8/04/89	HARVEST HED/PLT 8/04/89				
01	LENTGRAN	WP 45%	0.67	POST	58	68	48	24.8	16351.5	8.2	19				
02	LENTGRAN	WP 45%	0.90	POST	76	78	60	31.2	20592.0	10.3	26				
03	LENTGRAN	WP 45%	0.45	EPOST	73	79	61	46.2	30492.0	15.2	27				
04	LENTGRAN	WP 45%	0.45	POST	78	73	61	60.6	39996.0	20.0	33				
	LENTGRAN	WP 45%	0.45	LPOST											
05	LENTGRAN	WP 45%	0.90	POST	79	48	48	17.9	11814.0	5.9	16				
	POAST	EC 1.50	0.25	POST											
	C.O.C.	EC 1.00	0.25	POST											
06	LENTGRAN	WP 45%	0.90	POST	90	93	75	38.8	25608.0	12.8	27				
	STINGER	EC 3.00	0.25	POST											
07	DUAL	EC 8.00	3.63	PREEM	18	43	55	20.6	13563.0	6.8	14				
08	DUAL	EC 8.00	3.63	PREEM	75	85	80	58.1	38329.5	19.2	33				
	LENTGRAN	WP 45%	0.90	POST											
09	DEVRINOL	WP 50%	1.80	PREEM	18	43	30	4.4	2887.5	1.5	6				
10	DEVRINOL	WP 50%	1.80	PREEM	80	94	66	51.6	34039.5	17.0	32				
	LENTGRAN	WP 45%	0.90	POST											
11	HANDWDCHK				100	99	99	134.8	88935.0	44.5	42				
12	CONTROL				5	20	18	4.8	3151.5	1.6	7				
				LSD(0.05) =	29	24	27	22.1	14556.0	7.3	11				
				STANDARD DEVIATION =	20	17	19	15.3	10081.0	5.0	8				
				COEFF. OF VARIABILITY =	32	25	33	37.1	37.1	37.1	33				

O R E G O N S T A T E U N I V E R S I T Y

PYRIDATE IN CABBAGE PRODUCTION 1989

EXPT. LOCATION:Corvallis/Benton, OR 97331 USA
RESEARCH BY:Garvin Crabtree INITIATED:05/15/89 COMPLETED: / /

TRT NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	CABBAGE %INJURY 6/16/89	WRAD/MS %CONTRL 6/16/89	SHPURS %CONTRL 6/16/89	GRNDSL %CONTRL 6/16/89	NGHTSHD %CONTRL 6/16/89	OVALLVC %CONTRL 6/16/89	CABBAGE %INJURY 6/28/89	MUSTRAD %CONTRL 6/28/89	LESSWAP %CONTRL 6/28/89	NGHTSHD %CONTRL 6/28/89	LMBSQTR %CONTRL 6/28/89	Rep Mea ber
01	LENTGRAN WP	45%	0.67	POST	5	10	90	20	50	60	15	70	0	95	90	101
					15	30	20	10	80	50	0	50	50	70	50	211
					15	10	15	10	70	65	15	50	0	70	90	303
					5	20	10	100	30	35	10	20	100	30	70	410
				MEAN =	10	18	34	35	58	53	10	48	38	66	75	
02	LENTGRAN WP	45%	0.90	POST	10	10	50	40	60	60	20	60	20	100	90	102
					15	40	50	5	90	70	0	50	70	100	60	205
					5	20	40	100	90	75	15	30	100	90	100	311
					5	50	40	60	90	75	10	60	70	50	100	412
				MEAN =	9	30	45	51	83	70	11	50	65	85	88	
03	LENTGRAN WP	45%	0.45	BPOST	0	5	50	20	100	70	10	70	0	95	100	103
					5	50	50	20	100	75	0	60	50	100	95	203
					5	10	10	10	70	60	0	75	50	60	90	304
					0	50	50	70	80	60	10	20	30	50	90	405
				MEAN =	3	29	40	30	88	66	5	56	33	76	94	
04	LENTGRAN WP	45%	0.45	POST	10	10	20	20	100	70	10	80	50	100	100	101
	LENTGRAN WP	45%	0.45	LPOST	10	20	20	10	30	30	15	75	50	100	20	202
					15	20	90	50	70	45	25	70	70	70	60	301
					15	20	50	50	80	65	25	50	20	80	100	402
				MEAN =	13	18	45	33	70	53	19	69	48	88	70	
05	LENTGRAN WP	45%	0.90	POST	20	10	20	10	50	50	20	30	0	50	70	105
	POAST	EC 1.50	0.25	POST	10	20	70	20	50	40	10	30	70	10	90	204
	C.O.C.	EC 1.00	0.25	POST	20	20	10	30	85	70	30	60	50	70	100	305
					25	20	30	90	75	70	40	60	100	50	100	411
				MEAN =	19	18	33	38	65	58	25	45	55	45	90	
06	LENTGRAN WP	45%	0.90	POST	5	10	20	100	100	70	10	70	30	100	100	106
	STINGER	EC 3.00	0.25	POST	5	15	20	100	70	60	0	50	60	70	90	207
					5	15	50	50	75	60	0	40	50	85	100	302
					10	20	50	100	90	70	30	40	100	100	100	404
				MEAN =	6	15	35	88	84	65	10	50	60	89	98	

O R E G O N S T A T E U N I V E R S I T Y

PYRIDATE IN CABBAGE PRODUCTION 1989

TRT NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION	CABBAGE %INJURY 6/16/89	CABBAGE %CONTRL 6/16/89	HEAD/MS %CONTRL 6/16/89	SHPURS %CONTRL 6/16/89	CRHDSL %CONTRL 6/16/89	HGHTSHD %CONTRL 6/16/89	OVALLWC %CONTRL 6/16/89	CABBAGE %INJURY 6/28/89	MUSTRAD %CONTRL 6/28/89	LRSSNAP %CONTRL 6/28/89	HGHTSHD %CONTRL 6/28/89	LMBSQTR %CONTRL 6/28/89	Rep Number
07	DUAL	EC	8.00 3.63	PREEM	0	0	0	0	20	30	0	30	100	0	70		107
					10	0	20	0	40	30	10	40	50	20	0		210
					15	20	20	100	80	60	5	60	100	60	100		307
					5	0	80	50	80	50	15	30	100	70	100		406
				MEAN =	8	5	30	38	55	43	8	40	81	38	68		
08	DUAL	EC	8.00 3.63	PREEM	15	20	20	100	100	80	30	60	75	100	100		108
	LENTGRAN	WP	45% 0.90	POST	15	90	85	80	90	85	25	75	75	85	100		212
					15	40	90	100	100	90	30	80	95	90	100		312
					25	20	90	100	80	75	35	50	95	90	100		411
				MEAN =	18	43	71	95	93	83	30	66	85	91	100		
09	DEVRINOL	WP	50% 1.80	PREEM	0	0	0	100	30	30	0	20	85	0	100		109
					5	10	5	100	20	15	0	30	20	20	40		201
					0	0	10	100	30	30	10	30	100	0	100		304
					0	0	20	20	0	10	10	20	100	0	100		408
				MEAN =	1	3	9	80	20	21	5	25	76	5	85		
10	DEVRINOL	WP	50% 1.80	PREEM	5	100	20	50	70	60	10	80	100	50	100		110
	LENTGRAN	WP	45% 0.90	POST	10	20	60	10	100	80	40	60	80	80	100		206
					20	70	70	100	100	85	25	70	100	80	100		309
					10	15	50	100	100	70	20	40	100	80	100		407
				MEAN =	11	51	50	65	93	74	24	63	95	73	100		
11	HANDHOEK				0	100	100	100	100	100	0	100	100	100	100		111
					0	100	100	100	100	100	0	100	100	100	100		209
					0	100	100	100	100	100	0	100	100	100	100		310
					0	100	100	100	100	100	0	100	100	100	100		403
				MEAN =	0	100	100	100	100	100	0	100	100	100	100		
12	CONTROL				0	0	0	100	30	20	10	10	10	40	40		112
					0	0	0	0	0	0	10	0	0	0	50		208
					0	0	0	0	0	0	10	20	20	0	50		306
					0	0	20	20	0	0	20	0	100	0	100		405
				MEAN =	0	0	5	30	8	5	13	8	33	10	60		

O R E G O N S T A T E U N I V E R S I T Y

PYRIDATE IN CABBAGE PRODUCTION 1989

EXPT. LOCATION:Corvallis/Benton, OR 97331. USA
RESEARCH BY:Garvin Crabtree INITIATED:05/15/89 COMPLETED: / /

TRT NO.	PESTICIDE NAME	FORMU.	Lbai/A	APPLI-CATION TYPE	MAYWEED %CONTRL 6/28/89	GRNDSEL %CONTRL 6/28/89	SHEPURS %CONTRL 6/28/89	HARVEST LBS/PLT 8/04/89	HARVEST LBS/A 8/04/89	HARVEST T/A 8/04/89	HARVEST HEAD/PLT 8/04/89	Rep Number
01	LENTGRAN WP 45%		0.67	POST	90	80	90	57.1	37686.0	18.8	37	101
					30	70	70	24.3	16038.0	8.0	21	211
					60	70	30	17.3	11418.0	5.7	18	303
					50	50	0	.4	264.0	.1	1	410
				MEAN =	58	68	48	24.8	16351.5	8.2	19	
02	LENTGRAN WP 45%		0.90	POST	100	90	90	47.8	31548.0	15.8	36	102
					75	70	40	22.8	15048.0	7.5	21	205
					60	100	60	26.1	17226.0	8.6	21	311
					70	50	50	28.1	18546.0	9.3	25	412
				MEAN =	76	78	60	31.2	20592.0	10.3	26	
03	LENTGRAN WP 45%		0.45	EPOST	70	90	70	63.1	41646.0	20.8	38	103
					100	80	70	64.3	42438.0	21.2	35	203
					70	75	65	44.3	29238.0	14.6	24	304
					50	70	40	13.1	8646.0	4.3	12	405
				MEAN =	73	79	61	46.2	30492.0	15.2	27	
04	LENTGRAN WP 45%		0.45	POST	100	80	85	98.5	59730.0	29.9	37	104
	LENTGRAN WP 45%		0.45	LPOST	100	90	30	64.7	42702.0	21.4	42	202
					80	70	90	63.6	41976.0	21.0	31	301
					30	50	40	23.6	15576.0	7.8	23	402
				MEAN =	78	73	61	60.6	39996.0	20.0	33	
05	LENTGRAN WP 45%		0.90	POST	70	30	50	10.9	7194.0	3.6	13	105
	POAST	BC	1.50	0.25 POST	80	70	40	4.4	2904.0	1.5	6	204
	C.O.C.	BC	1.00	0.25 POST	65	70	50	35.0	23100.0	11.6	27	305
					100	20	50	21.3	14058.0	7.0	19	411
				MEAN =	79	48	48	17.9	11814.0	5.9	16	
06	LENTGRAN WP 45%		0.90	POST	100	95	60	52.2	34452.0	17.2	37	106
	STINGER	EC	3.00	0.25 POST	75	80	75	44.5	29370.0	14.7	27	207
					85	95	85	28.3	18678.0	9.3	26	302
					100	100	80	30.2	19932.0	10.0	19	404
				MEAN =	90	93	75	38.8	25608.0	12.8	27	

PYRIDATE IN CABBAGE PRODUCTION 1989

TRT NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	MATURED %CONTRL 6/28/89	GRNDSEL %CONTRL 6/28/89	SHEPURS %CONTRL 6/28/89	HARVEST LBS/PLT 8/04/89	HARVEST LBS/A 8/04/89	HARVEST T/A 8/04/89	HARVEST HED/PLT 8/04/89	Rep Number
07	DUAL	EC	8.00	PREEM	0	30	50	36.7	24222.0	12.1	26	107
					20	60	60	18.4	12144.0	6.1	12	210
					20	30	50	27.1	17886.0	8.9	17	305
					30	50	60	.0	.0	.0	0	406
			3.63	MEAN =	18	43	55	20.6	13563.0	6.8	14	
08	DUAL	EC	8.00	PREEM	80	100	70	55.3	36498.0	18.2	34	108
	LENTGRAN	WP 45%	0.90	POST	70	75	80	88.9	58674.0	29.3	43	212
					100	70	90	69.7	46002.0	23.0	40	312
					50	100	80	18.4	12144.0	6.1	14	401
				MEAN =	75	86	80	58.1	38329.5	19.2	33	
09	DEVRINOL	WP 50%	1.80	PREEM	70	80	60	6.5	4290.0	2.1	10	109
					0	20	0	6.0	3960.0	2.0	6	201
					0	20	30	5.0	3300.0	1.7	6	304
					0	50	30	.0	.0	.0	0	408
				MEAN =	18	43	30	4.4	2887.5	1.5	6	
10	DEVRINOL	WP 50%	1.80	PREEM	80	100	50	66.4	43824.0	21.9	38	110
	LENTGRAN	WP 45%	0.90	POST	70	75	70	29.9	19734.0	9.9	22	206
					100	100	75	80.7	53262.0	26.6	47	309
					70	100	70	29.3	19338.0	9.7	22	407
				MEAN =	80	94	66	51.6	34839.5	17.0	32	
11	UNWEEDED				100	95	95	136.0	89760.0	44.9	43	111
					100	100	100	125.0	82500.0	41.3	41	209
					100	100	100	151.0	99660.0	49.8	39	318
					100	100	100	127.0	83820.0	41.9	44	403
				MEAN =	100	99	99	134.8	88935.0	44.5	42	
12	CONTROL				0	30	0	5.2	3432.0	1.7	7	112
					0	30	30	1.8	1188.0	.6	2	204
					20	0	20	12.1	7986.0	4.0	19	306
					0	20	20	.0	.0	.0	0	409
				MEAN =	5	20	18	4.8	3151.5	1.6	7	

WEED CONTROL IN CARROTS

Dan Curtis and Garvin Crabtree
Department of Horticulture
Oregon State University

Objectives of this study are, in general, to look for alternatives to the use of linuron (Lorox) in anticipation of the possible loss of the registration for its use on carrots and to seek more effective weed control programs for this crop. Specific objectives as listed initially remain as follows:

1) Identify herbicides with characteristics of good crop tolerance in carrots and effective control of weeds, especially certain broadleaf species which continue to be problem weeds in carrots grown in Oregon.

2) Develop a data base to be used in the pursuance of registrations for alternative herbicides.

Herbicide treatments showing promise in 1988 and combinations of herbicides suggested by that test were included in the 1989 field study. This work was carried out at the Oregon State University Horticulture Research Farm on a silty clay loam soil. Carrots, cv. Royal Chantenay, were seeded on May 10, 1989 immediately following application and soil incorporation of preplant (PPI) herbicide treatments. The schedule for other herbicide applications are as follows:

Preemergence (PRE) - May 11, 1989
Early postemergence (POST-1) - June 7, 1989, when carrots were in the 3-leaf stage
Mid postemergence (POST-2) - June 20, 1989, when carrots were in the 5-leaf stage
Late postemergence (POST-3) - July 6, 1989

Effectiveness of weed control was evaluated on July 13, 1989 and on October 10, 1989 the plots were harvested (10 ft. of row from each plot). The list of treatments and results are shown in the table.

Much of the interference with carrot growth and the consequent low yields in some treatments can be attributed to the lack of control of a heavy weed infestation, rather than to direct injury to the crop by herbicides. Failure to maintain a clean weeded check also shows the low tolerance for weeds by this crop.

Treatments providing the best selective weed control with the weed species present in this study were combinations of trifluralin (Treflan)/ clomazone (Command),

clomazone/metribuzin (Sencore), and clomazone/etiozin (Tycor). The other herbicide showing promise in this trial was pendimethalin (Prowl).

Further efforts to expand the options of growers for the use of herbicides on this crop should include 1) the evaluation of environmental interactions of the most promising treatments in this study, and 2) the pursuit of registrations for the use of one or more of these new herbicides (Command, Prowl, Tycor).

WEED CONTROL IN CARROTS - 1989
Table 1

Treatment				Weed Control (%)				Yield	
No.	Herbicide	Rate (lbs ai/A)	Timing	SOLSA	AMARE	SENVU	CHEAL	No. of Roots	Tons/A
1	clomazone	0.25	PPI	79	0	99	48	112	14.5
2	clomazone	0.50	PPI	95	15	100	90	115	25.7
3	clomazone	1.00	PPI	97	70	100	100	84	21.5
4	trifluralin	0.75	PPI	40	90	13	88	122	9.3
5	trifluralin/ clomazone	0.75 0.50	PPI PPI	80	100	100	100	112	32.4
6	pendimethalin	1.00	PRE	75	95	0	100	104	24.6
7	pendimethalin	2.00	PRE	88	100	13	100	113	29.9
8	pendimethalin/ clomazone	1.00 0.50	PRE PPI	95	99	99	100	123	36.6
9	metribuzin	0.25	POST-1	0	100	96	100	102	8.4
10	metribuzin	0.25	POST-2	22	51	59	69	112	6.7
11	metribuzin	0.50	POST-2	0	70	81	80	104	3.7
12	metribuzin/ metribuzin	0.25 0.25	POST-2 POST-3	20	93	80	83	140	7.0
13	metribuzin/ clomazone	0.25 0.50	POST-2 PPI	90	66	100	100	108	31.7
14	etiozon (Tycor)		1.00	PRE	15	100	56	100	118
16.2									
15	etiozon	2.00	PRE	50	100	99	100	122	24.2
16	etiozon/ clomazone	1.00 0.50	PRE PPI	100	100	100	100	83	34.6
17	linuron/ linuron	0.75 0.75	POST-1 POST-2	71	100	25	98	138	18.8
18	Weeded check			75	75	75	75	116	9.8
19	Unweeded check			0	0	0	0	107	3.7
	LSD (0.05)			29	30	22	27	33	8.7

Control of wild proso millet in 'Jubilee' sweet corn, 1989.

D. Curtis and Ray D. William, Horticulture Department
Oregon State University

Narrative: Results confirm previous research conducted in the midwest and in Oregon regarding the need for nearly perfect control of wild proso millet during early stages of corn growth, followed by a selective postemergence treatment that eliminates survivors and seedlings germinating later in the season. Surpass herbicide continued to provide superior control, whereas Eradicane-Extra controlled 10-15% less millet. Dual preplant incorporated provided better control than preemergence. Combinations with Dual (preemergence) plus Tandem/Aatrex/crop oil enhanced control. Other treatments were unacceptable. No injury to the corn was observed with any treatment.

Three experimental postemergence herbicides were evaluated to determine efficacy in millet control. The DPX (DuPont) materials were effective in stunting millet from the time of application to the end of the season, but a preplant treatment was needed to reduce crop-weed competition until the corn reached the six-leaf stage which was necessary for crop safety with the materials. Beacon herbicide (Ciba-Geigy) provided no millet control.

Current decisions regarding herbicide reregistration (loss of registrations) suggest the following practices will aid millet suppression in 'Jubilee' sweet corn:

1. Rotate with crops where a postemergence grass herbicide is registered for use to reduce viable seed in the soil.

2. Decrease between-row spacing to increase competition against millet.

3. Plant late to ensure maximum activity of preplant incorporated herbicides.

4. Apply a preplant incorporated herbicide such as Surpass or Eradicane Extra (pending registration). Addition of Dual will enhance control slightly, but requires economic evaluation by grower.

5. Postemergence treatments consist of directed sprays aimed at bottom 12 inches of the stalk and must occur after the corn whorl has grown past this height. Currently, Gramoxone Super (ICI) and Evik (Ciba-Geigy) are registered for this purpose.

*Note: Eradicane-Extra contains a new safener for corn which may provide adequate safety for 'Jubilee' sweet corn west of the Cascades. Previously, the initial safener leached faster than the EPTC resulting in unprotected corn seed.

O R E G O N S T A T E U N I V E R S I T Y

WILD PROSO MILLET CONTROL IN SWEET CORN PRODUCTION 1989

Results: table 1

				wild proso millet % control		corn harvest ears/20ft	Quality	Tons/A
NO.	NAME	Rate LBai/A	date:	6/15/89	8/11/89		9/12/89	Lbai/A
01	CHECK			0	0	12	2.1	1.65
02	PROWL	2.0	PRE	44	41	22	2.8	4.56
	AATREX	1.5	PRE					
03	PROWL	2.0	PRE	33	56	25	3.6	5.09
	AATREX	1.5	POST					
	TANDEM	.75	POST					
	CROP OIL		POST					
04	PROWL	4.0	PRE	35	83	36	4.0	7.99
	AATREX	1.5	POST					
	TANDEM	.75	POST					
	CROP OIL		POST					
05	ERADICANE	4.0	PPI	79	24	26	3.5	4.36
	AATREX	1.5	PPI					
06	ERADICANE	4.0	PPI	86	39	29	4.0	6.20
	AATREX	1.5	PPI					
	DUAL	2.0	PRE					
07	ERADICANE	4.0	PPI	73	43	27	3.5	4.27
	AATREX	1.5	PPI					
	GRAMOXONE	.28	POSTD					
08	ERADICANE	4.0	PPI	83	79	34	3.8	7.31
	AATREX	1.5	POST					
	TANDEM	.75	POST					
	CROP OIL		POST					
09	ERAD-EX	4.0	PPI	83	35	26	3.1	4.29
	AATREX	1.5	PPI					
10	ERAD-EX	4.0	PPI	84	74	37	3.8	7.95
	AATREX	1.5	POST					
	TANDEM	.75	POST					
	CROP OIL		POST					
11	ERAD-EX	4.0	PPI	88	74	29	3.6	5.59
	AATREX	1.5	PPI					
	GRAMOXONE	.28	POSTD					

O R E G O N S T A T E U N I V E R S I T Y

WILD PROSO MILLET CONTROL IN SWEET CORN PRODUCTION 1989

Results(table 1 continued)

NO.	NAME	RATE LBai/A	date:	wild proso millet % control 6/15/89	wild proso millet % control 8/11/89	corn harvest ears/20ft	corn harvest Quality	corn harvest Tons/A 9/12/89
12	ERAD-EX	4.0	PPI	86	63	32	3.9	6.37
	AATREX	1.5	PPI					
	DUAL	2.0	PRE					
13	ERAD-EX	4.0	PPI	86	93	36	4.3	8.36
	DUAL	2.0	PRE					
	AATREX	1.5	POST					
	TANDEM	.75	POST					
	CROP OIL		POST					
14	DUAL	2.0	PRE	31	10	11	2.0	1.34
	AATREX	1.5	PRE					
15	DUAL	2.0	PRE	24	59	26	3.6	5.68
	AATREX	1.5	POST					
	TANDEM	.75	POST					
	CROP OIL		POST					
16	DUAL	2.0	PPI	71	78	33	3.9	7.18
	AATREX	1.5	POST					
	TANDEM	.75	POST					
	CROP OIL		POST					
17	EPTAM	4.0	PPI	89	35	25	3.9	5.00
18	AATREX	1.5	PRE	28	10	12	2.1	1.74
19	SURPASS	6.14	PPI	93	89	42	4.4	9.37
	AATREX	1.5	POST					
	TANDEM	.75	POST					
	CROP OIL		POST					
20	LASSO	2.5	PRE	38	40	31	3.8	6.06
	AATREX	1.5	POST					
	TANDEM	.75	POST					
	CROP OIL		POST					
21	DPX9360	.0312	POST1	18	55	25	3.4	4.47
	X-77		POST1					
22	DPX79406	.0312	POST1	5	61	26	3.0	4.30
	X-77		POST1					

O R E G O N S T A T E U N I V E R S I T Y

WILD PROSO MILLET CONTROL IN SWEET CORN PRODUCTION 1989

Results(table 1 continued)

NO.	NAME	RATE LBai/A	date:	wild proso millet % control 6/15/89	wild proso millet % control 8/11/89	corn harvest ears/20ft	corn harvest Quality 9/12/89	corn harvest Tons/A
23	DPX79406	.0312	POST1	19	64	27	3.1	4.53
	AATREX	1.5	POST1					
	X-77		POST1					
24	BEACON	.0312	POST1	8	5	5	1.5	.58
	X-77		POST1					
	LSD (.05) =			26	26	2	11	2.55
	STD DEV =			18	18	1	8	1.77
	C.V. =			34	35	20	29	34.17

crop oil was applied a rate of 1 Qt. per acre

X77 was applied at a rate of 0.25% v/v

% control = percent control, 0 = no control,
100 = complete control
# ears/20ft = the aveage number of corn ears harvested
in 20 feet within each treatment
Quality = an indication of average tip fill by treatment
1 = very poor tip fill, 5 = all ears filled

Tons/acre = average projected gross yield from each
treatment

```
PROJECT TYPE (H/I etc): H   PROJECT NO.:                    TRIAL ID.:
CITY/COUNTY:MARION                          ST:OR   ZIP:              COUNTRY:USA
RESEARCH BY:CURTIS,WILLIAM,          LAST UPDATE:03/15/34    INITIATED:05/30/89
COOPERATOR :RAY BARTOSZ              EXPT. STATUS:C          COMPLETED:10/06/89
REPORTED BY:CURTIS                   RELATED FILE:**NONE**   SOURCE:

PREVIOUS CROP:SWEET CORN JUBILEE     PLOT / Ft:8     x30     ROW WIDTH/In:36
PREVIOUS TILL:                       SOIL TEXTURE:                      OM%:0
                              CEC:0     %SAND:0     %SILT:0     %CLAY:0     pH:0.0

PREVIOUS TRT.:SURPASS, EVIK, ATRAZINE                       EXPT. DESIGN:RCBD
FERTILIZER   :30LBS N BANDED 5/31 138LBS N BRDCST 6/25      NUM. OF REPS:4
MISC. INFO.  :                                              REPORT TYPE:INTERIM

CROP:CORN              VARIETY:JUBILEE
PLANTING DATE:05/31/89  DEPTH/In:1.5     SPACING/In:10 LBS/ A   NUM.PLANTS:
HARVEST DATE :09/12/89              SEASONAL RAINFALL DURING EXPERIMENT
```

** SET 1 OF 1 **	APPLIC. 1	APPLIC. 2	APPLIC. 3	APPLIC. 4	APPLIC. 5
GEN. APPLIC. TYPE	PPI	PRE	POST	POST 1	POSTD
APPLICATION DATE	05/30/89	06/02/89	06/15/89	06/28/89	07/25/89
JULIAN DATE/YEAR	J150/89	J153/89	J166/89	J179/89	J206/89
START HR / END HR	15:00/16:30	09:00/10:20	14:45/16:00	02:15/03:15	04:00/04:30
APPLIC. METHOD	BRDCST	BRDCST	BRDCST	BRDCST	DSPRAY
AIR/SOIL TEMP (F)	73 / 74	79 / 74	64 / 70	71 / 74	0 / 0
% REL. HUMIDITY	0	62	50	47	0
WIND DIR. / VELOC	N / 03	-- / 00	SW / 05	-- / 0	/ 0
SKY / SOIL COND.	CLEAR/FN+RK	/FN+RK	CLDY /FN+RK	/	/
SOIL/LEAF MOIST.	DRY / -0-	DRY / -0-	WET / WET	DRY / DRY	DRY / DRY
INCORP. EQUIPMENT	ROTOTILLER	-0-	-0-	-0-	-
INCORP. DEPTH(in)	3	0	0	0	0
SPRAYER TYPE	UNI/COMPAIR	UNI/COMPAIR	UNI/COMPAIR	UNI/COMPAIR	UNI/CO2
SPRAYER GPA / PSI	22.68 / 30	22.68 / 30	22.68 / 30	22.68 / 30	30.25 / 30
MIX SIZE (Gallon)	0.125	0.125	0.125	0.125	0.125
NOZZLE TYPE /NUM.	8003/5 @18"	8003/5 @18"	8003/5 @18"	8003/5 @18"	8003/2 @18"
RAINFALL/IRRIG.in					
0-24 HR/1-3 DAYS	/	/	/	/	/
4-7 DAYS/2ND WEEK	/	/	/	/	/
3RD WEEK/4TH WEEK	/	/	/	/	/

	SPECIE CODE	SPECIES	APPLIC. 1 DEN./STG.	APPLIC. 2 DEN./STG.	APPLIC. 3 DEN./STG.	APPLIC. 4 DEN./STG.	APPLIC. 5 DEN./STG.
	*******	****** CROP ******	*********	*********	*********	*********	*********
		SWEET CORN	/	/	/0-6LF	/	/
	*******	****** PEST ******	*********	*********	*********	*********	*********
1		WILD PROSO MILLET	/	/	/1-5LF	/	/

Ornamentals - Summary

Bedding plant tolerance. Weed control with Gallery and Pennant herbicides was improved with irrigation following treatment, whereas Snapshot performed similarly either pre- or postplant. Although sweet alyssum, coleus, impatiens, and Lobelia plants were slow to establish, Pennant provided the greatest tolerance while growth of sweet alyssum was adequate with Gallery either pre- or postemergence. Begonia, Cosmos, and Zinnia exhibited the greatest tolerance to all herbicides and application methods. Growth reduction occurred with several plants, but flowering remained normal.

Bedding Plant Tolerance to Gallery, Snapshot, and Pennant Herbicides

Robert L. Ticknor and Martha Taggart[1]

OBJECTIVES: To determine bedding plant tolerance to postplant applications of Gallery 75DF, Pennant 5G and 7.8E, and Snapshot 80DF and 2.5TG.

To determine plant tolerance to preplant treatments of Gallery and Snapshot formulations.

To evaluate herbicide efficacy.

PROCEDURE: Gallery 75DF was applied at 1 and 2 lbs ai/A, Snapshot 80DF at 4 and 8 lbs. ai/A, and Snapshot 2.5TG at 5 and 10 lbs. ai/A preplant to the bedding plants on June 5th and postplanting on June 13th. Pennant 5G and 7.8E were applied postplanting at 4 and 8 lbs ai/A on June 13th. Dacthal 75W was applied postplanting as a standard on June 13th. An untreated control was included. No rainfall or irrigation was received by the preplanting treatments, whereas postplant treatments were watered for two hours after planting and 1 hour after the herbicides were applied.

Preplant treatments were not irrigated to avoid development of weeds in the untreated areas until after planting. The lack of initial irrigation could have changed the effectiveness and crop plant injury of the preplant treatments. Irrigation thereafter was applied as needed to maintain soil moisture (Table 1).

Ten popular bedding plant species were planted in the trial. Three plants of each species were planted in each of four replications of the 18 treatments. Spacing was 2 feet within the row and 4 feet between rows.

Herbicides were applied at 100 gallon per acre rate with a Solo backpack sprayer. Granular treatments were distributed with an Acme Spread-Rite hand held deflection spreader.

[1]Professor of Horticulture, Oregon State University and Student Intern from Clackamas Community College.

Weed populations in the trial were counted on August 10, 1989 (Table 2). Selective control of weeds such as *Poa annua, Digitaria sanguinales, Amaranthus retroflexus, Anthemis cotula,* and *Senacio vulgaris* was recorded.

The effect of postapplication conditions was evident with Gallery 75DF where the number of *Poa, Digitaria,* and *Amaranthus* plants was greater in the unirrigated preplant treatments compared to the postplant treatments which received irrigation immediately after spraying. *Poa* was eliminated when the application of Gallery 75DF was followed by irrigation. Snapshot 80DF and 2.5TG were very effective in controlling weeds present in the plot area, both pre and postplanting.

Dacthal has not been a particularly effective herbicide in previous trials at Aurora. It controlled *Crabgrass-Digitaria sanguinalis* which can be a major weed in bedding plants in many areas, but failed to suppress other weeds.

Pennant 5G and 7.8E were effective in preventing weed growth when applied and irrigated afterwards. With the low weed population, it is not possible to determine whether one form gave better results.

Bedding plant growth and survival was affected by product and rate of application. Some of the least vigorous plants such as Sweet Alyssum, Coleus, Impatiens, and Lobelia had poorer establishment and growth than did the more vigorous species. The Coleus plants available were small and this species grows best in partial to full shade. Plant losses were high and growth was poor in full sun.

Sweet Alyssum grew and flowered as well with preplant as postplant application of Gallery 75DF, Snapshot 80DF, and Snapshot 2.5TG. There was no statistical difference in plant size due to treatment. Flower ratings did vary by treatment with all Gallery and Snapshot treatments except Gallery 75DF at 1 lb ai/A producing fewer flowers than the control. Flower production with Dacthal and Pennant was not significantly different from the control.

Begonia semperflorens growth and flowering was not affected by pre or postplanting application of Gallery and Snapshot or postplanting of Dacthal. Both plant size and flower production were reduced by Pennant, compared to the control.

Although Coleus did not grow well in the trial there were differences between treatments. Preplanting application of Gallery and Snapshot appears to be safer than postplanting application although the differences are not statistically significant. However, growth is significantly less than the control. Growth with Dacthal and Pennant except the high rate of 5G was not significantly less than the control.

Significant differences were lacking between herbicides for Cosmos.

Differences in flowering with Impatiens were not significantly different but plant growth was significantly less than the control in all treatments except Pennant 7.8E at 4 lbs ai/A. Preplant application of Gallery 75DF and Snapshot 80DF caused the greatest reduction in plant growth.

Differences in flowering of Lobelia were not significantly different. Although all the differences were not significantly different preplant application of Gallery 75DF and Snapshot 80DF were less injurious to the plants than postplanting applications. Best growth of Lobelia was with Dacthal where plants were larger than in any other herbicide treatment and were equal to the control.

Differences in flowering of Marigolds were not significantly different. Although the differences were not always significant the largest plants were found in the postplanting applied Dacthal, Pennant 5G at 4 and 8 lbs ai/A, Pennant 7.8E at 4 lbs ai/A, and the control.

Preplanting application of Gallery 75DF, Snapshot 80DF, and Snapshot 2.5TG reduced growth of Petunia and compared to postplant applications. Plants in all treatments were significantly smaller than the control while flowering in many treatments were equal to the control.

Flowering of Portulaca was sparse so data were not collected. Although differences were not always significant, growth in the postplant application was usually greater. Growth in the control was significantly larger than all other treatments except postplanting applied Gallery 75DF, Pennant 5G 4 lbs ai/A, and Pennant 7.8E 4 lbs ai/A.

Zinnia flowering was also sparse and differences were not significantly different. The largest plants were the controls, but only Gallery 75DF 2 lbs ai/A, Snapshot 80 DF 4 and 8 lbs ai/A, and Snapshot 2.5TG 10 lbs ai/A of the preplant treatments and Snapshot 80DF at 4 lbs ai/A and Pennant 7.8E at 8 lbs ai/A of the postplant treatments were significantly smaller.

Final plant measurements were recorded September 5 and 6 (Table 4). Height + maximum width + width at a right angle in centimeters was divided by 3 to give a growth index. This number was used for statistical analysis. There were some marked differences between treatments and in some cases between rates of the same product. With a large number of treatments, the gradual differences found between treatments often are not significantly different.

The number of surviving plants in each treatment are presented in Table 5. Plant survival could be a good indicator whether a product should be considered for use on a particular plant.

Table 1. Irrigation applied to the 1989 bedding plant herbicide trial based on nozzle delivery rate and running time (0.50 inches/1.15 hrs) in the treated area at the North Willamette Research and Extension Center.

Inches of rain and irrigation received. Evaporation from a free water surface listed at bottom of the monthly rainfall total.

	June		July		August		September	
	Rain	Irr.	Rain	Irr.	Rain	Irr.	Rain	Irr.
1					.26			.50
2					.25		.03	
3				.75				
4						.75		.50
5				.50				
6								
7				.75		.75		
8								
9						.50		
10				.50				
11						.50		
12		.75		.50				
13		.50						
14	.16			.50		.75		
15	.21							
16		.50	.08			.50		
17		.50	.13					
18				.50		.50		
19		.50						
20	.19			.50				
21					.04	.50		
22		.50			.18			
23		.50			.64			
24				.75				
25		.50				.50		
26		.50		.50				
27								
28		.50		.50		.50		
29	.02							
30	.33					.50		
31			.31					
	.91	5.25	.52	6.25	1.37	6.25	.03	1.00
Net Evaporation	3.06		6.57		4.43		.97	

Table 2. Total number of weeds from several herbicide treatments applied pre- and postplant to bedding plants, North Willamette Experiment Station, 1989.

	Herbicide	Rate (lbs. ai/A)		Weeds (see below)									
				1	2	3	4	5	6	7	8	9	10
1	Gallery 75DF	PRE	1	19	31	77			1				3
2	" "	PRE	2	3		60							
3	Snapshop 80DF	PRE	4										1
4	" "	PRE	8			4		2					1
5	Snapshot 2.5TG	PRE	5										
6	" "	PRE	10		1								1
7	Gallery 75DF	POST	1		7	5							
8	" "	POST	2										
9	Snapshot 80DF	POST	4										
10	" "	POST	8										
11	Snapshot 2.5TG	POST	5										
12	" "	POST	10										
13	Dacthal 75W	POST	10	17	2	74		142	7		52		2
14	Pennant 5G	POST	4		1	8	9						
15	" "	POST	8				2						
16	Pennant 7.8E	POST	4			8					2	4	
17	" "	POST	8			4	1						
18	Check			65	3	169	17	74	8	3	30	9	9

1 Poa annua - Annual Bluegrass
2 Digitaria sanguinalis - Crabgrass
3 Amaranthus retroflexus - Pigweed
4 Spergularia rurra - Sand spurry
5 Anthemis cotula - Dogfennel
6 Hypochaeris radicata - False dandelion
7 Lactuca serriola - Prickly lettuce
8 Senacio vulgaris - Groundsel
9 Taraxicum officinale - Dandelion
10 Miscellaneous

Counted on August 10, plant treatments applied June 5, 1989. Plants set out June 12, 1989. Post planting treatments applied June 13, 1989.

Table 3. Bedding plant tolerance ratings to several new herbicides, North Willamette Experiment Station, 1989[a]

	Herbicide	Rate (lbs. ai/A)	Sweet Alyssum 'Carpet of Snow' PL	Sweet Alyssum 'Carpet of Snow' FL	Begonia Semperflorens PL	Begonia Semperflorens FL	Coleus Hybrid 'Wizard Mix' PL	Cosmos 'Sunny Red & S. Yellow' PL	Impatiens Superelfin Mix PL	Impatiens Superelfin Mix FL	Lobelia Cambridge Blue PL	Lobelia Cambridge Blue FL	Marigold 'Yellow Boy' PL	Marigold 'Yellow Boy' FL	Petunia 'Pink Dandy' FL	Petunia 'Pink Dandy' FL	Portulaca 'Double Mix' PL	Zinnia 'Peter Pan Mix' PL	Zinnia 'Peter Pan Mix' FL
1	Gallery 75DF	1	2.9	1.8ABC[z]	3.1BC	2.1B	1.4AB	2.8	2.0A	2.0	2.2BCD	1.2	2.5ABC	1.5	2.0A	2.6C	2.5ABC	2.8BC	1.1
2		2	3.1	1.4AB	3.1BC	2.3B	1.6ABC	2.6	2.1A	1.9	2.5DE	1.4	2.3AB	1.2	2.0A	1.5AB	2.7ABC	2.2A	1.0
3	Snapshot 80DF	4	2.8	1.0A	2.8BC	2.0AB	1.7ABC	3.0	2.0A	1.7	2.2BCD	1.2	2.1A	1.5	2.0A	2.2BC	2.2A	2.2A	1.1
4		8	2.8	1.1AB	2.8BC	1.7AB	1.6ABC	2.8	2.2AB	1.5	2.0ABCD	1.4	2.2AB	1.7	2.0A	1.4AB	2.2A	2.6AB	1.2
5	Snapshot 2.5TG	5	2.6	1.0A	3.2C	1.8AB	1.6ABC	3.0	2.4ABC	2.4	2.8DE	1.2	2.8BCD	1.6	2.2B	2.0ABC	2.0A	2.8BC	1.0
6		10	2.8	1.2AB	3.6C	2.1B	1.4AB	3.1	2.6BCD	2.4	2.1ABCD	1.1	2.8BCD	1.3	2.2B	2.4C	2.2AB	2.5AB	1.4
7	Gallery 75DF	1	2.9	1.0A	3.1BC	1.8AB	1.1A	3.6	3.0DE	2.2	1.5AB	1.0	2.8BCD	1.1	2.9GH	1.6AB	3.2CD	2.8BC	1.2
8		2	2.8	1.0A	3.1BC	1.9AB	1.2A	2.8	2.6BCD	1.6	1.2A	1.0	2.6ABC	1.2	2.8FG	1.0A	3.0BCD	2.8BC	1.0
9	Snapshot 80DF	4	2.8	1.0A	2.7ABC	1.6AB	1.2AB	2.8	2.8BCD	1.9	1.7ABC	1.0	2.6ABC	1.1	3.0H	1.0A	2.7ABC	2.7AB	1.2
10		8	2.9	1.0A	3.2C	1.4AB	1.0A	2.8	2.4ABC	1.6	1.4A	1.0	2.5ABC	1.1	2.6D	1.0A	2.6AB	2.8ABC	1.2
11	Snapshot 2.5TG	5	2.8	1.0A	2.9BC	2.1B	1.1A	3.2	2.8BCD	2.4	2.0ABCD	1.2	2.7ABC	1.3	3.0H	1.2AB	2.3AB	2.8BC	1.0
12		10	2.2	1.0A	3.2C	2.0AB	1.2A	3.0	2.8CD	2.0	1.8ABC	1.0	2.2AB	1.2	2.6DE	1.2A	2.5ABC	2.8BC	1.0
13	Dacthal 75W	10	3.4	4.0D	3.1BC	1.8AB	2.4D	3.5	2.8CD	2.1	3.7F	1.6	3.3E	1.6	2.8F	1.3AB	2.7ABC	2.9BC	1.4
14	Pennant 5G	4	3.2	3.0CD	2.2AB	1.1A	2.0BCD	3.1	3.0DE	1.5	2.8DE	1.0	2.9CDE	1.5	2.6D	1.3AB	3.0BCD	2.9BC	1.1
15		8	2.6	2.5BC	1.8A	1.1A	1.4AB	2.8	2.5ABC	1.0	2.5CDE	1.0	3.0CDE	1.8	2.4C	1.0A	2.5ABC	2.8BC	1.2
16	Pennant 7.8E	4	3.0	1.9ABC	2.0AB	1.0A	2.0CD	3.0	3.4EF	2.6	2.5CDE	1.2	2.9CDE	1.8	2.7E	1.7ABC	3.4CD	2.9BC	1.2
17		8	2.9	1.8ABC	1.8A	1.0A	1.7ABCD	2.7	2.8BCD	1.6	2.7DE	1.0	2.8BCD	1.3	2.4C	1.1A	2.6ABC	2.7AB	1.0
18	Check		3.5	3.0CD	3.2C	2.2B	2.3D	3.2	3.6F	2.5	3.2EF	1.2	3.2DE	1.5	3.1I	2.1BC	3.6D	3.3C	1.2
			N.S.					N.S.		N.S.		N.S.		N.S.					N.S.

[a]Plant (PL) rating (1 Dead, 2 Small, 3 Medium, 4 Large) and flower (FL) rating (1 None, 2 Light, 3 Medium, 4 Heavy) of 10 bedding plant species as affected by pre and post planting herbicide treatments. Preplanting treatments applied June 5, 1989. Plants set out June 12, 1989. Postplanting treatments applied June 13, 1989. Plants rated August 7, 1989.

[z]Mean separation in columns by Duncan's Multiple Range Test, 5% Level

Table 4. Bedding plant growth index[a] as affected by several new herbicides, North Willamette Experiment Station, 1989.

Herbicides		lbs. ai/A	Bedding Plants 1	2	3	4	5	6	7	8	9	10
1. Gallery 75 DF	PRE	1	9.7 ABC	14.3 DEF	1.5	39.5 A	10.4 A	11.2 ABCD	29.4 BCDEF	35.0 BCD	18.0 ABCD	23.2 AB
2. " "	PRE	2	6.8 AB	13.4 CDEF	1.4	42.2 ABC	9.0 A	10.0 ABCD	25.8 AB	40.4 BCDE	16.0 ABCD	25.3 AB
3. Snapshot 80 DF	PRE	4	5.4 AB	13.5 CDEF	0.9	42.6 ABC	11.3 A	7.5 ABCD	27.4 BC	37.2 BCD	10.5 ABC	22.8 AB
4. " "	PRE	8	8.2 AB	12.0 BCDE	1.3	41.0 AB	12.4 AB	7.6 ABCD	21.3 A	30.3 B	7.6 AB	24.6 AB
5. Snapshot 2.5 TG	PRE	5	17.4 BCD	18.4 EFG	1.9	45.5 ABC	16.9 ABC	16.7 DE	31.6 BCDEF	35.9 BCD	6.7 AB	33.1 D
6. " "	PRE	10	8.8 AB	14.7 DEF	2.0	41.1 AB	15.0 ABC	13.7 D	31.6 CDEF	12.0 A	5.1 A	32.6 CD
7. Gallery 75 DF	POST	1	12.2 ABC	23.2 G	0.0	50.9 ABC	27.0 DE	3.1 ABC	29.6 BCDEF	57.9 E	43.3 D	28.5 BCD
8. " "	POST	2	0.0	21.0 G	0.0	46.4 ABC	23.2 CDE	0.0	29.4 BCDEF	47.1 BCDE	35.4 BCD	24.0 AB
9. Snapshot 80 DF	POST	4	5.6 AB	13.2 CDEF	0.0	47.5 ABC	22.2 BCDE	1.6 A	28.7 BCDE	52.1 DE	16.2 ABCD	21.3 A
10. " "	POST	8	0.4 A	6.8 AB	0.0	45.0 ABC	16.5 ABC	0.0	27.8 BCD	32.3 BC	11.9 ABC	20.2 A
11. Snapshot 2.5 TG	POST	5	15.9 BCD	20.9 G	0.0	53.4 C	24.4 CDE	7.9 ABCD	28.8 BCDE	48.8 CDE	20.8 ABCD	26.6 ABCD
12. " "	POST	10	5.5 AB	18.8 FG	0.0	51.4 ABC	18.8 ABCD	2.5 AB	27.1 BC	41.6 BCDE	12.3 ABC	23.0 AB
13. Dacthal 75 W	POST	10	26.7 D	17.5 DEFG	4.4	42.6 ABC	22.4 CDE	13.2 CD	34.6 F	45.4 BCDE	31.9 ABCD	26.2 ABC
14. Pennant 5 G	POST	4	27.2 D	12.8 BCDEF	5.3	46.4 ABC	27.2 DE	16.4 DE	32.5 DEF	56.7 E	37.2 CD	28.6 BCD
15. " "	POST	8	21.8 CD	3.5 A	3.0	39.4 A	21.6 BCDE	12.1 BCD	26.7 BC	44.7 BCDE	35.8 BCD	21.9 A
16. Pennant 7.8 E	POST	4	28.0 D	11.1 BCD	6.5	47.0 ABC	30.1 E	13.8 D	29.9 BCDEF	57.1 E	39.4 CD	24.8 AB
17. " "	POST	8	21.9 CD	7.4 ABC	5.0	45.3 ABC	21.4 BCDE	12.9 CD	27.7 BC	47.5 BCDE	32.1 ABCD	25.1 AB
18. Check			28.4 D	22.3 G	6.1	52.6 BC	28.3 DE	24.4 E	34.3 EF	58.6 E	41.7 D	32.1 CD

[a] Growth Index Height + Width + Width/3 in centimeters of bedding plants on September 5-6, 1989 which were planted June 12, 1989. Preplant treatments applied June 5, 1989 and postplanting treatments June 13, 1989.

Mean separation in a column by Duncan's Multiple Range Test 5% Level.

1	Alyssum	Carpet of Snow
2	Begonia	Semperflorens
3	Coleus	Wizard Hybrid Mix
4	Cosmos	Sunny Red & Sunny Yellow
5	Impatiens	Superelfin Mix
6	Lobelia	Cambridge Blue
7	Marigold	Yellow Boy
8	Petunia	Pink Dandy
9	Portulaca	Double Moss Rose
10	Zinnia	Peter Pan Mix

Table 5. Effect Pre and Post Planting Application of Herbicides 6/5/89 - Pre and 6/13/89 Post on survival of plants set out June 12, 1989. Number of plants alive when measured on September 5-6, 1989 from four replications of three plants per treatment.

Herbicide	lbs. ai/A		Bedding Plants									
			1	2	3	4	5	6	7	8	9	10
1. Gallery 75 DF	PRE	1	12	12	1	12	11	11	12	12	12	12
2. " "	PRE	2	11	12	2	12	11	9	12	11	12	12
3. Snapshot 80 DF	PRE	4	10	12	2	12	10	11	12	11	12	12
4. " "	PRE	8	6	12	3	12	12	8	12	12	12	10
5. Snapshot 2.5 TG	PRE	5	12	12	2	12	12	12	12	12	11	12
6. " "	PRE	10	6	12	2	11	12	7	12	12	11	12
7. Gallery 75 DF	POST	1	5	12	0	11	12	1	12	12	12	12
8. " "	POST	2	0	10	0	11	9	0	12	12	10	12
9. Snapshot 80 DF	POST	4	3	10	0	10	12	1	12	12	12	11
10. " "	POST	8	1	7	0	12	11	0	12	12	9	9
11. Snapshot 2.5 TG	POST	5	6	12	0	12	12	4	12	12	11	11
12. " "	POST	10	3	11	0	12	12	1	12	11	9	11
13. Dacthal 75 W	POST	10	12	11	3	12	12	12	12	12	12	12
14. Pennant 5 G	POST	4	12	8	7	12	12	10	12	12	12	12
15. " "	POST	8	11	6	3	12	12	11	12	12	12	9
16. Pennant 7.8 E	POST	4	11	11	7	12	12	9	12	12	12	12
17. " "	POST	8	12	8	5	12	12	12	12	12	12	12
18. Check			12	12	7	12	12	12	12	12	12	12

1	Alyssum	Carpet of Snow
2	Begonia	Semperflorens
3	Coleus	Wizard Hybrid Mix
4	Cosmos	Sunny Red & Sunny Yellow
5	Impatiens	Superelfin Mix
6	Lobelia	Cambridge Blue
7	Marigold	Yellow Boy
8	Petunia	Pink Dandy
9	Portulaca	Double Moss Rose
10	Zinnia	Peter Pan Mix