Horticultural Weed Control 1991 Report

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

Compiled by: Debra Boquist, Research Assistant - Horticultural Weed Science

Ray D. William, Extension Horticultural Weed Specialist

Garvin Crabtree, Professor - Horticultural Weed Science

Secretarial Assistance: Colleen Calderwood

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.

TABLE OF CONTENTS

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.

Weather Data 1991

Forest Grove

daily precipitation and temperatures (° F minimum and maximum)

	February			March			April			May			June			July			August			September		
Day	in.	min	max	in.	min	max	in.	min	max	in.	min	max	in.	min	max	in.	min	max	in.	min	max	in.	min	max
1	.06	33	45		31	65		42	69		39	73		43	72		51	74		48	90	.27	46	67
2	.85	39	49	.30	40	54	.28	33	58		41	80		46	79		59	90		50	83		47	77
3	.58	46	51	1.23	43	52	.18	43	60		40	81		37	73		63	102		48	90		46	83
4	.29	46	52	.73	43	53	1.47	46	53		39	70		36	67		51	91		52	92		61	92
5	.38	40	51	.24	32	46	1.79	46	59		39	69		40	70		49	86		56	89		58	97
6		32	54	.14	33	52	.30	30	59		48	65	.05	52	77		46	83		52	79		60	95
7		32	57	.05	32	52	.55	34	55	.03	49	67	.03	49	71		58	87		62	86		52	92
8		33	56		33	51	.03	33	60	.49	43	59		53	67		50	97		60	83		58	70
9		33	50		32	58	.70	37	45	.07	33	53		51	74		50	92	.04	58	95		47	67
10		32	56	.15	32	48	.21	33	53	.06	32	60		51	89		52	79		61	76		51	74
11	.04	39	54	.11	30	50	.02	30	52	.03	44	59		50	82		51	86		50	77		46	81
12	.33	41	53	.68	34	43		30	56	T	42	60		46	71		51	92		50	87		49	79
13	.34	46	52	.10	32	55		38	63	T	47	61	.03	48	70		54	96		53	92		49	75
14	.04	50	59	.02	35	56		38	69	.10	43	62	.06	46	70		59	81		56	89		42	69
15	.02	50	64	.20	33	50	.35	33	59		34	67		44	70	.11	46	85		59	94		49	75
16	.05	35	54		34	55		36	60		45	70	T	45	65	.02	54	71		58	97		49	84
17	.04	35	50		31	58	.09	41	68	.49	46	76	.02	42	66	T	51	71		58	86		55	89
18	.16	39	51		33	65		45	60	.17	45	54		49	74		46	70		56	97		60	91
19	.04	41	52	.10	37	51		39	69	.35	44	56		54	85		49	83		59	96		56	89
20	1.01	47	58	.08	36	51		41	79	.05	46	58	.53	49	66		49	79		49	96		43	84
21	.03	40	52	.11	38	60		46	80		45	68	.69	49	54		44	87		55	98		41	68
22		35	58	T	39	59		47	64		39	68		51	65		52	88		56	96		48	74
23		33	57	.14	39	50		43	68		40	69		53	67		61	99		56	93		49	81
24		32	62	.35	37	53	.09	40	56	.01	47	72		52	73		61	106		49	77		57	83
25		31	66		34	58	.11	39	56	.05	48	64		53	71	.14	52	72		47	80		54	90
26		35	62		32	60	.28	35	53	.10	44	61	T	53	66		47	78		42	79		50	95
27		32	68		33	62	.09	36	58		46	60		45	72		49	87		52	82		53	81
28		33	68		35	63	T	39	60		47	62		59	84		56	89	.06	52	70		58	67
29					34	60	.13	38	65		48	70		53	75		58	90	.26	55	77		45	67
30					37	61		37	65	.23	42	60		52	71		56	91	.02	54	80		53	82
31					35	72				.03	42	64					53	94		52	83			
avg		37.9	56.1		34.8	55.6		38.3	61.0		42.8	65.1		48.4	71.9		52.5	86.3		53.7	86.7		51.1	80.6
ttl	4.26			4.73			6.67			2.26			1.41			.27			.38			.27		

Weather Data 1991

North Willamette Research and Extension Center

	February			March			April			May			June			July			August			September		
	daily precipitation and temperatures (° F minimum and maximum)																							
Day	in.	min	max	in.	min	max	in.	min	max	in.	min	max	in.	min	max	in.	min	max	in.	min	max	in.	min	max
1	.06	39	53		32	62		49	68		40	74	-				54	70		50	91	.18	50	65
2	.39	41	54	.38	45	58	.07	45	55		42	75	-				56	85		50	79		48	72
3	.31	48	59	.58	45	50	.06	43	56		42	74	-				59	97		55	85		47	79
4	.19	48	59	.54	44	56	.12	50	56		39	64	-				51	90		59	88		57	90
5	.43	43	56	.46	32	45	.91	48	60		44	66	-				49	89		58	85		54	92
6	.02	31	54	.10	32	47	.16	34	57	.33	51	58	-				46	79		55	75		52	92
7	T	33	53	.08	36	50	.57	38	50	.03	52	64	-				46	84		55	83	.12	50	84
8	.02	33	52	.06	38	48	.11	36	51	.93	43	64	-				51	90		61	85		52	68
9		33	54		34	57	.78	37	50	.17	38	54	-				50	85		62	90		48	68
10		35	50	.43	34	51	.07	35	52	.09	40	57	-				49	73	.38	52	72		50	80
11	.04	37	52		33	48	.06	30	51		47	54	-				52	79		50	73		46	83
12	.27	41	57	.20	36	46		34	60		48	59	-				54	87		50	81		48	79
13	.32	47	54	.06	32	53		31	70		47	57	-			T	56	90		54	85		54	80
14	.06	50	57	.04	38	54		36	65	.15	35	59	-				50	75		55	84		42	72
15	.03	50	60	.08	35	48	.24	38	55		37	63	-			T	50	79		55	88		46	74
16	.14	40	54		30	52		40	57		46	65	-			.02	55	73		56	89		50	84
17	.04	39	53		39	59	.34	41	62	1.78	46	71	-				58	73		57	88		50	88
18	.08	40	53		39	64	T	41	56	.59	45	50	-				52	73		58	90		54	92
19	.10	42	54	.34	36	49		39	64	.10	46	54	-				50	80		58	85		53	91
20	.56	50	56	.07	33	50		41	75	.02	48	55	-				50	80		55	92		44	87
21	.63	43	53	.07	36	50		48	72		51	65	-				50	81		54	91		41	71
22	T	36	55	.35	38	51		47	60		39	64	-				50	84		55	90		43	74
23		33	59	.27	37	50		42	65		40	64	-				55	94		55	89		48	81
24		33	61	.28	36	54	.27	41	55		42	68	-				60	100		48	78		56	83
25		37	65	T	34	55	.50	38	52		44	61	-			.14	59	74		47	76		52	91
26		37	71		37	50	.03	37	54	.12	44	58	-				52	73		44	75		50	95
27		32	69		32	58	.14	39	55		48	60	-				53	82		44	79		48	80
28		32	65		35	59		39	58	.02	48	61	-				57	87	.23	56	65		50	80
29					31	56	.19	36	59		44	64	-				55	87	.07	56	67		46	70
30					31	60		41	61	.25	43	55	-				55	87	.07	52	83		46	77
31					40	72					43	60	-				58	88	T	54	81			
avg		39.4	56.9		35.8	53.6		39.8	58.7		43.9	61.8		M	M		53.0	82.8		53.9	82.6		49.2	80.7
ttl	3.69			4.39			4.62			4.58			M			.16			.75			.30		

E

Weather Data 1991

Salem WSO Airport

daily precipitation and temperatures (° F minimum and maximum)

	February			March			April			May			June			July			August			September		
Day	in.	min	max	in.	min	max	in.	min	max	in.	min	max	in.	min	max	in.	min	max	in.	min	max	in.	min	max
1	.02	42	60	.28	45	59	.03	46	58		40	74		42	74		50	85		49	80		44	73
2	1.12	50	59	.93	46	51	.13	44	58	T	41	72		46	74		54	95		54	85		46	80
3	.55	50	60	.82	44	57	.32	45	56		39	67		35	64		54	89		51	88		51	92
4	.68	49	56	.75	34	49	.35	51	60		35	70		33	67		49	82		53	85		53	93
5	T	37	53	T	32	47	.65	35	58	.36	48	57	T	34	68		51	79		56	79		54	93
6		32	52	.29	33	50	.68	33	48	.02	51	66	.08	53	67		46	81		54	85		50	87
7		33	55	T	32	50	.05	38	55	.89	48	58	T	50	69		50	89	T	58	83	T	57	72
8		34	55		35	54	.37	36	50	.19	38	55		51	73		48	84		61	91		52	70
9		34	51	.53	35	53	.20	40	53	T	37	58		43	83		47	74	.02	59	76		49	81
10		34	49	.06	31	49	.06	35	51	.01	45	56		48	84		56	79		57	74		49	83
11	.12	40	58	.29	32	46		29	58		49	59		45	71		50	87		50	82		44	79
12	.38	47	51	.02	35	55		29	68	T	49	58	.09	44	64		53	89		51	86		47	81
13	.19	51	58		34	53		35	67	.01	47	63	T	48	65		56	76		53	86	.04	50	74
14		51	58	.18	34	50	.45	44	55		32	65		48	70		49	80		51	89		41	75
15	.08	48	57		34	52		39	57		40	67	T	47	65	.08	54	72		57	88		44	87
16	.06	35	54		31	58		39	64	.47	44	72	T	39	65	.03	59	73		53	82		49	90
17	T	39	54		30	64		38	61	1.76	45	50		35	72		57	75		56	90		53	95
18	.12	43	54	.09	40	53		43	66	.34	46	55		46	81		48	79		54	87		53	93
19	T	51	58		35	53		36	73	.06	49	55	.14	51	61		52	75		57	91		51	89
20	.40	46	57	.12	29	55		48	71		50	65	.67	50	54		44	83		53	93		40	72
21		39	56	.11	36	51		43	62		45	68	.15	48	60		47	83		54	91		37	73
22		36	58	.24	39	50		40	63		42	64		48	68		56	95		56	88		39	83
23		32	59	.32	35	51	.28	42	55		41	72		50	73		63	98		55	73		51	84
24		30	64	.05	38	54	.18	40	53	T	42	64		55	66	T	59	73		43	76		52	95
25		36	71	.10	31	50	.13	39	54	.01	42	60	T	54	65	T	57	74		42	74		52	94
26		33	68		32	58	.12	40	55		48	64		48	70		49	83		43	79		48	82
27		30	65		31	60		38	60		42	63	.08	43	77		57	88	.27	54	65		48	68
28	T	29	62	T	34	55	.12	36	59	.10	45	66	.34	56	68		54	88	.19	57	65		56	72
29					30	60		31	61	.24	43	57		56	66		54	89	.04	58	89		44	77
30					33	68		36	74	.05	40	63		52	71		56	90		52	83		47	85
31					42	69					37	68					55	92	.15	52	66			
avg		39.7	57.6		34.9	54.3		38.9	59.4		43.2	62.9		46.6	69.2		52.7	83.2		53.3	82.2		48.4	82.4
ttl	3.72			5.18			3.84			4.51			1.55			.11			.67			.04		

Weather Data 1991

Stayton

daily precipitation and temperatures (° F minimum and maximum)

	February			March			April			May			June			July			August			September		
Day	in.	min	max	in.	min	max	in.	min	max	in.	min	max	in.	min	max	in.	min	max	in.	min	max	in.	min	max
1	.12	39	50		47	62	.02	48	68		42	71	-				53	69	-			-		
2	.40	39	60	.72	47	58	.02	45	55		44	72	-				56	82	-			-		
3	1.35	48	56	.88	45	55	.10	43	53		43	71	-				59	91	-			-		
4	.35	50	62	1.18	43	56	.11	49	55		38	71	-				51	87	-			-		
5	.50	44	56	.43	37	43	1.11	46	61		49	71	-				50	79	-			-		
6	T	32	57	.48	36	43	.55	36	51	.45	51	58	-				48	75	-			-		
7		32	46	.18	35	47	.51	36	51	.04	50	61	-				51	78	-			-		
8		32	57	T	38	48	.21	36	51	1.20	43	57	-				51	87	-			-		
9		31	51		38	53		43	50	.40	39	51	-				50	87	-			-		
10		35	43	.70	33	53	.08	36	53	.20	42	54	-				51	73	-			-		
11	.20	37	50	.03	35	47	.14	35	48	T	46	53	-				51	77	-			-		
12	.55	44	57	.22	40	46		34	55	.03	46	55	-				54	84	-			-		
13	.44	45	57	.07	35	50		39	66		46	56	-				59	87	-			-		
14	.09	44	56	.15	38	50		45	64	.05	39	59	-				49	74	-			-		
15	.03	47	53	.11	33	46	.34	43	54		44	62	-			.04	49	87	-			-		
16	.32	42	53		32	51		41	54		45	64	-			.05	59	70	-			-		
17	.10	40	53		36	56		40	61	1.85	45	68	-			.13	56	71	-			-		
18	.19	40	53	.13	41	62		41	59	1.38	44	49	-				50	72	-			-		
19	.15	40	53		37	51		42	60	.18	44	52	-				51	77	-			-		
20	.25	50	56		30	49		49	71	.02	49	55	-				47	72	-			-		
21	.07	44	56	.45	35	52	.03	48	71		50	62	-				47	79	-			-		
22		42	54	.10	35	52		45	58		43	65	-				47	81	-			-		
23		32	56	.26	40	51		45	62		41	62	-				48	92	-			-		
24		31	56	.28	40	51	.50	42	55		48	69	-				63	96	-			-		
25		36	61		31	53	.59	39	55	.02	44	62	-			.05	59	74	-			-		
26		35	70	.10	31	53	.26	39	53	.02	46	60	-				51	74	-			-		
27		35	65		32	56	.22	41	53		46	60	-				53	80	-			-		
28		34	61	T	40	59	.10	38	57	.14	48	58	-				55	86	-			-		
29				.03	32	54	.12	35	57		42	62	-				55	85	-			-		
30					34	58		38	58	.43	44	62	-				56	86	-			-		
31					34	66				T	42	59	-				56	87	-					
avg		39.3	55.6		36.8	52.6		41.2	57.3		44.6	61.0		M	M		52.7	80.6		M	M		M	M
ttl	5.11			6.50			5.01			6.41			M			.27			M			M		

Weather Data 1991

Troutdale Substation

daily precipitation and temperatures (° F minimum and maximum)

Day	February in.	February min	February max	March in.	March min	March max	April in.	April min	April max	May in.	May min	May max	June in.	June min	June max	July in.	July min	July max	August in.	August min	August max	September in.	September min	September max
1	-			T	37	67	.06	48	72		41	71		49	71		56	72	.46	55	93		50	76
2	-			.60	37	54	.05	46	61		43	80		46	77		56	88		54	78		48	75
3	-			.47	40	55	.10	45	60		46	79		41	73		61	91		55	87		52	88
4	-			.53	44	61	.12	50	61		40	64		40	66		53	89		57	89		56	92
5	-			.28	34	44	.81	49	63		53	73		43	68		52	85		59	85		54	95
6	-				35	49	.50	36	54	.27	51	62	.04	52	66		48	80		54	75		53	94
7	-			.09	38	50	.27	41	51	.26	46	60		46	73		52	85		61	82		54	86
8	-			.05	38	50	.44	37	53	.70	47	63		48	76		54	92		63	88		52	67
9	-				36	54	.44	41	55	.12	41	57		50	70		52	86		62	94		44	67
10	-			.34	36	57	.21	37	53		47	52		53	87		55	72	.16	52	75		47	84
11	-				35	51	.01	34	54		47	56		53	88		53	80		51	76		49	82
12	-			.25	36	49		38	63	.13	48	55	.03	48	68		57	89		52	83		50	80
13	-				33	54		39	74	.02	48	57	.20	48	60		60	92		55	88	.02	53	79
14	-			.14	39	55		40	72		42	64	.42	48	60		50	76		58	86	.01	44	75
15	-				38	50	T	42	69		43	55		47	61	T	55	80		60	92		45	78
16	-				34	53		42	60		46	59		45	62	T	54	75		60	93		47	88
17	-				36	60		44	65	.88	48	75	.02	42	68	.03	58	76		60	83		51	91
18	-				44	63		41	61	.97	46	53		46	75		49	74		61	90		55	91
19	-			.25	36	47	.12	45	62	.03	47	57		53	84		53	80		60	89		52	91
20	-			.14	33	53		47	78		50	56	1.07	50	65		54	76		62	90		49	88
21	-			.08	42	60		51	78		50	70	.70	49	57		51	82		63	97		48	74
22	-			.21	39	54		47	62		43	66	T	53	59		55	86		60	90		48	78
23	-			.14	39	49		41	67		41	67		52	68		62	98		55	89		48	82
24	-			.79	40	56	.27	42	59	.06	46	72	T	55	73		64	103		53	73		50	85
25	-			T	31	56	.33	39	55	.06	46	67		54	64		59	77		52	77		52	92
26	-				35	53	.40	40	55	.20	45	65		53	63		53	74		50	77		53	91
27	-				32	58		40	55		44	62		47	70		56	83		52	80		54	90
28	-				38	62	.42	41	60	.20	48	60		53	81		56	89	.22	55	64		50	80
29	-				34	60	.12	40	55		47	66	.10	53	68		56	90	.10	57	67		48	78
30	-				40	62		43	65	.25	45	58		54	70		56	89	.04	55	85		50	83
31	-				46	73				.02	48	61					57	90	.08	52	78			
avg					37.3	55.5		42.2	61.7		45.9	63.3		49.0	69.7		55.1	83.8		56.6	83.6		50.2	83.3
ttl	M			4.46			4.67			4.17			2.58			.03			1.06			.03		

H

Postemergence Weed Control in Snap Beans with Blazer (acifluorfen)

D. Boquist and R. D. William, Department of Horticulture
Robert L. Rackham, Benton County Extension
Oregon State University

Prior research trials with acifluorfen (Blazer) identified tolerance in snap beans when postemergent treatments were applied after the first trifoliate was completely expanded and before the visual emergence of any flower parts. Both nightshade and pigweed control was excellent. Although leaves were injured initially, they quickly recovered and plants produced similar yields as other treatments. Residue samples were collected in 1990 from Oregon, Wisconsin, New York, and North Carolina, and are currently being analyzed by OSU Ag Chemistry. This label will require 3rd-party registration since BASF decided the use represents more visual crop injury than Basagran.

A trial was conducted in 1991 at the OSU vegetable farm to further evaluate optimum timing of Blazer for crop tolerance and efficacy. Rates of 0.25 lbs ai/A and 0.50 lbs ai/A were applied as directed applications (aimed below the crop canopy) in two sets of postemergent treatments: 1) during the primary leaf stage (first trifoliate still tightly folded) and 2) as directed or broadcast applications at the two-leaf stage (one trifoliate fully expanded) before flower primordia formed. Comparison of harvest weights indicate earlier applications maintained the highest yields and provided optimum control of emerged weeds. The opportunity for the earlier application was important since temperatures dramatically increased causing rapid development of both beans and weeds. Full coverage of both broadcast and directed applications at the later timing was inhibited by the crop canopy, while many of the contacted weeds were oversized and suffered only slight stunting. No injury symptoms or stand reduction was evident from directed applications at either timing; however beans treated with broadcast applications did exhibit injury symptoms and suffered significant yield reduction. Results indicate a broader range of application timing is available for directed applications of Blazer in snap bean production. Additional studies should further evaluate the full range of application timing and crop tolerance.

OSU VEG FARMS BEAN TRIAL

EXPT. LOCATION: CORVALLIS/BENTON,
RESEARCH BY: BOQUIST/WILLIAM INITIATED: 07/02/91 COMPLETED: 10/10/91

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	INJURY BNS0-10 7/26/91	WEEDS CTL0-10 7/26/91	#BNPLNT /3 FT 8/07/91	NIGHTSH CTL0-10 8/09/91	PIGWEED CTL0-10 8/09/91	BN VIGR 0-10 8/09/91	BN NJRY 0-10 8/09/91	HARVEST WT(LBS) 9/09/91
01	COBRA	EC 2.00	.25	PRE	0	10	18.3	9	9	9	0	8.75
02	COBRA	EC 2.00	.50	PRE	2	10	21.5	10	10	9	0	9.38
03	BLAZER	SC 2.00	.25	PODI1	0	9	NA	8	9	10	0	8.92
	X-77	XA 1.00	.25	PODI1								
04	BLAZER	SC 2.00	.50	PODI1	2	10	NA	10	10	9	1	8.90
	X-77	XA 1.00	.25	PODI1								
05	BLAZER	SC 2.00	.25	PODI2	0	0	NA	6	6	10	0	6.10
	X-77	XA 1.00	.25	PODI2								
06	BLAZER	SC 2.00	.50	PODI2	0	0	NA	8	9	10	0	8.74
	X-77	XA 1.00	.25	PODI2								
07	BLAZER	SC 2.00	.25	POBR2	0	0	NA	4	8	9	1	6.18
	X-77	XA 1.00	.25	POBR2								
.	BASAGRAN	EC 2.00	.75	POBR2	0	0	NA	5	6	9	2	9.11
09	CONTROL				0	0	19.0	2	0	8	0	2.53
				LSD(0.05) =	1	1	3.3	4	2	1	1	1.69
				STANDARD DEVIATION =	1	0	2.2	2	2	1	1	1.13
				COEFF. OF VARIABILITY =	105	7	26.3	27	17	7	128	11.58

OSU VEG FARMS BEAN TRIAL

EXPT. LOCATION: CORVALLIS/BENTON,
RESEARCH BY: BOQUIST/WILLIAM INITIATED: 07/02/91 COMPLETED: 10/10/91

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	BEANS SZ 1-2 9/05/91	BEANS SZ 3 9/05/91	BEANS SZ 4 9/05/91	BEANS SZ 5 9/05/91	BEANS SZ 6 9/11/91	BEANS SZ 7 9/11/91
01	COBRA	EC 2.00	.25	PRE	4.6	6.0	6.2	.2	2.6	.1
02	COBRA	EC 2.00	.50	PRE	4.6	5.2	5.7	1.2	2.9	.1
03	BLAZER	SC 2.00	.25	PODI1	2.2	3.8	5.0	1.8	4.7	0
	X-77	XA 1.00	.25	PODI1						
04	BLAZER	SC 2.00	.50	PODI1	3.2	5.3	5.2	.4	1.9	.1
	X-77	XA 1.00	.25	PODI1						
05	BLAZER	SC 2.00	.25	PODI2						

** SET 1 OF 1 ** GEN. APPLIC. TYPE	APPLIC. 1 PRE	APPLIC. 2 PODI1	APPLIC. 3 PODI2	APPLIC. 4 POBR2	APPLIC. 5
APPLICATION DATE	07/02/91	07/24/91	07/28/91	07/28/91	/ /
JULIAN DATE/YEAR	J183/91	J205/91	J209/91	J209/91	J /
START HR / END HR	04:30/05:30	08:30/09:00	08:10/09:40	08:10/09:40	: / :
APPLIC. METHOD	BROADCA	DIRECTD	DIR	BROADCA	
AIR/SOIL TEMP (F)	0 / 0	0 / 0	76 / 0	76 / 0	0 / 0
% REL. HUMIDITY	0	0	58	58	0
WIND DIR. / VELOC	/ 0	/ 0	NE / 2	NE / 2	/ 0
SKY / SOIL COND.	/	/	CLEAR/SCLOD	CLEAR/	/
SOIL/LEAF MOIST.	/	/	DRY / DRY	DRY / DRY	/
INCORP. EQUIPMENT					
INCORP. DEPTH(in)	0	0	0	0	0
SPRAYER TYPE	CO2 UNICYCL	CO2 DIR UNI	CO2 UNI DIR	CO2 UNICYCL	
SPRAYER GPA / PSI	22.68 / 30	30.26 / 30	30.26 / 30	22.68 / 30	0 / 0
MIX SIZE (Gallon)	.125	.125	.125	.125	0
NOZZLE TYPE /NUM.	8003/5	8004/2	8004/2	8004/5	
RAINFALL/IRRIG.in					
0-24 HR/1-3 DAYS	1/2" /	1/4" /	/	/	/
4-7 DAYS/2ND WEEK	/	/	/	/	/
3RD WEEK/4TH WEEK	/	/	/	/	/

EXPERIMENT COMMENTS

PODI1=APPLY HERBICIDE AS 1ST TRIFOLIATE IS UNFOLDING
PODI2=APPLY HERBICIDE AFTER 1ST TRIFOLIATE HAS EXPANDED AND BEFORE 2ND TRIFOLIATE IS COMPLETELY UNFOLDING AND BEFORE FLOWER PRIMORDIA HAS FORMED. ACTUALLY TREATED - 1ST TRIFLTE EXPANDED BUT STILL SMALL, 2ND TRIFLTE UNFOLDING AND FLOWER PRIMORDIA PRESENT. HOT WEATHER PROMPTED RAPID GROWTH WHEN PLANTS STILL SMALL
PODI - DIRECTED APPLICATION IS TO SPACINGS BETWEEN ROWS, 36" (2)=72" 6'(30')=180 SQUARE FEET

.25 LBS AI/A (1 GAL/2 LBS AI) (3785 MLS/GAL) /43560 (180 FT2) = 1.95 MLS/PLOT

IRRIGATION:
7/10 2 HRS - 2/3"
7/12 .5 HR - 1/6"
7/13 1 HR - 1/3"
7/22 3 HRS - 1"

Preemergence Weed Control in Snap Beans with Cobra (lactofen)

D. Boquist and R. D. William, Department of Horticulture
Robert L. Rackham, Benton County Extension
Oregon State University

As a follow up to research conducted since 1987, and IR-4 residue and tolerance trials in 1990 with Cobra (lactofen), four snap bean trials were conducted to continue field and crop assessments.

Lactofen (Cobra) 2 EC was applied immediately following planting as a broadcast preemergence application at rates of 0.25 lbs ai/A and 0.50 lbs ai/A (1x and 2x). Soil types within trials included both silt loam and silty clay loam soils with organic matter at or above 2%, and sand content ranging from 9.7% to 26%. None of the trials received excessive precipitation during the first 2-3 weeks. Treatments were evaluated visually for injury and vigor, and quantitatively for stand (number of bean plants/3 linear feet), and yield which included field harvest weights and grade sizes.

As in previous years, snap beans demonstrated good tolerance to broadcast preemergence applications of Cobra at 0.25 lbs ai/A. Bean plants exhibited good vigor in both treatments after 30 days. Stand counts were comparable with untreated plots. No yield reductions (or grade size differences) were recorded with the 0.25 lbs ai/A rate in any of the four trials. Though early leaf crinkling was recorded in 50% of the trials, it was not observed after bean plant establishment. Bean plants treated with the 2x rate of 0.50 lbs ai/A exhibited significantly more leaf crinkling (though not observed once plants became established) and slight yield reductions.

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

91 BEAN TRIAL - Horning Farm

EXPT. LOCATION:MONROE/BENTON,
RESEARCH BY:BOQUIST/WILLIAM   INITIATED:06/20/91   COMPLETED:08/25/91

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	BEAN %INJURY 7/22/91	#BNPLNT /3 FT 8/07/91	HARVEST WT(LBS) 8/20/91	BEANS SZ 1-2 8/20/91	BEANS SZ 3 8/20/91	BEANS SZ 4 8/20/91	BEANS SZ 5 8/20/91	BEANS SZ 6 8/20/91	BEANS SZ 7 8/20/91
01	COBRA	EC 2.00	0.25	PRE	.5	25.5	10.6	9.1	10.0	11.0	9.4	.9	0
02	COBRA	EC 2.00	0.50	PRE	.5	24.8	10.3	7.4	9.6	10.0	7.8	.3	.1
03	CONTROL				.3	26.3	9.6	8.6	11.0	10.0	7.3	.4	0
	LSD(0.05) =				.8	5.7	1.3	NA	NA	NA	NA	NA	NA
	STANDARD DEVIATION =				.4	3.3	.7	NA	NA	NA	NA	NA	NA
	COEFF. OF VARIABILITY =				105.8	12.9	7.1	NA	NA	NA	NA	NA	NA

BEAN TRIAL - Nixon Farm

EXPT. LOCATION:MONROE/LINN,
RESEARCH BY:BOQUIST/WILLIAM   INITIATED:05/24/91   COMPLETED:08/05/91

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	BEAN %INJRY 6/13/91	#BNPLNT /3 FT. 7/01/91	VIGOR BEANS 7/01/91	HRVST WT(LBS) 8/02/91	BEANS SZ 1-2 8/02/91	BEANS SZ 3 8/02/91	BEANS SZ 4 8/02/91	BEANS SZ 5 8/02/91	BEAN SZ 6-7 8/02/91
01	COBRA	EC 2.00	0.25	PRE	.8	34	99	6.83	7.5	17.3	3.4	.2	0
02	COBRA	EC 2.00	0.50	PRE	25.0	29	94	7.16	8.1	17.3	3.1	.1	0
03	CONTROL				5.0	35	100	7.22	7.8	17.3	3.3	.2	0
	LSD(0.05) =				13.3	4	4	.64	NA	NA	NA	NA	NA
	STANDARD DEVIATION =				8.8	2	2	.43	NA	NA	NA	NA	NA
	COEFF. OF VARIABILITY =				172.5	15	5	12.10	NA	NA	NA	NA	NA

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

91 BEAN TRIAL - KENAGY FARMS

EXPT. LOCATION:ALBANY/BENTON,
RESEARCH BY:BOQUIST/WILLIAM   INITIATED:06/03/91   COMPLETED:09/01/91

TRT. NO.	NAME	FORMU.	LBai/A	APPLI-CATION TYPE	CROP INJRY 6/13/91	CHEN CNTRL 6/13/91	# CHEN /SQ FT 6/13/91	HENBIT CNTRL 6/13/91	#HENBIT /SQ FT 6/13/91	#BNPLNT /3 FT 7/01/91	HARVEST WT(LBS) 8/05/91
01	COBRA	EC 2.00	0.25	PRE	0	9.9	NA	9.5	NA	23	12.99
02	COBRA	EC 2.00	0.50	PRE	0	10.0	NA	9.9	NA	23	11.52
06	CONTROL				0	0	15.8	0	3.2	22	10.74
	LSD(0.05) =				NA	.1	3.2	.2	1.1	3	1.07
	STANDARD DEVIATION =				NA	.1	2.1	.1	.7	2	.71
	COEFF. OF VARIABILITY =				NA	1.6	80.4	4.2	136.2	15	12.10

91 BEAN TRIAL - KENAGY FARMS

EXPT. LOCATION:ALBANY/BENTON,
RESEARCH BY:BOQUIST/WILLIAM   INITIATED:06/03/91   COMPLETED:09/01/91

TRT. NO.	NAME	FORMU.	LBai/A	APPLI-CATION TYPE	BEANS SZ 1-2 8/05/91	BEANS SZ 3 8/05/91	BEANS SZ 4 8/05/91	BEANS SZ 5 8/05/91	BEANS SZ 6 8/05/91	BEANS SZ 7 8/05/91
01	COBRA	EC 2.00	0.25	PRE	4.7	7.3	13.0	20.1	3.4	.2
02	COBRA	EC 2.00	0.50	PRE	4.7	7.2	11.8	18.2	3.3	.2
06	CONTROL				3.8	6.4	12.3	16.7	2.5	.1
	LSD(0.05) =				NA	NA	NA	NA	NA	NA
	STANDARD DEVIATION =				NA	NA	NA	NA	NA	NA
	COEFF. OF VARIABILITY =				NA	NA	NA	NA	NA	NA

OSU VEG FARMS BEAN TRIAL

EXPT. LOCATION: CORVALLIS/BENTON,
RESEARCH BY: BOQUIST/WILLIAM   INITIATED: 07/02/91   COMPLETED: 10/10/91

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	INJURY BNS0-10 7/26/91	WEEDS CTL0-10 7/26/91	#BNPLNT /3 FT 8/07/91	NIGHTSH CTL0-10 8/09/91	PIGWEED CTL0-10 8/09/91	BN VIGR 0-10 8/09/91	BN NJRY 0-10 8/09/91	HARVEST WT(LBS) 9/09/91
1	COBRA	EC 2.00	.25	PRE	0	10	18.3	9	9	9	0	8.75
2	COBRA	EC 2.00	.50	PRE	2	10	21.5	10	10	9	0	9.38
3	BLAZER	SC 2.00	.25	POOI1	0	9	NA	8	9	10	0	8.92
	X-77	%A 1.00	.25	POOI1								
4	BLAZER	SC 2.00	.50	POOI1	2	10	NA	10	10	9	1	8.90
	X-77	%A 1.00	.25	POOI1								
5	BLAZER	SC 2.00	.25	POOI2	0	0	NA	6	6	10	0	6.10
	X-77	%A 1.00	.25	POOI2								
6	BLAZER	SC 2.00	.50	POOI2	0	0	NA	8	9	10	0	8.74
	X-77	%A 1.00	.25	POOI2								
7	BLAZER	SC 2.00	.25	POBR2	0	0	NA	4	8	9	1	6.18
	X-77	%A 1.00	.25	POBR2								
8	BASAGRAN	EC 2.00	.75	POBR2	0	0	NA	5	6	9	2	9.11
9	CONTROL				0	0	19.0	2	0	8	0	2.53
	LSD(0.05) =				1	1	2.9	3	2	1	1	1.73
	STANDARD DEVIATION =				1	0	2.0	2	1	1	1	1.19
	COEFF. OF VARIABILITY =				121	8	30.3	31	19	8	145	15.56

The Effect of Decreasing Rectangularity on Weed Control in Beans

S. Eskelsen, D. Boquist, D. McGrath, and G. Crabtree
Department of Horticulture & OSU Extension Service, Oregon State University

OBJECTIVES AND DEFINITION OF RECTANGULARITY

This study was designed to determine if decreasing rectangularity in bean plantings will improve the crop's ability to compete with weeds; and, to determine how decreasing rectangularity interacts with various weed control treatments.

Rectangularity refers to planting arrangement. In conventional row spacings of 30 inches rectangularity is very large since the distance between bean plants within the row is very small and the distance between plants between rows is very large. With a constant crop plant population as row spacing decreases, rectangularity decreases. In this situation the distance between plants within the row becomes larger, and the distance between plants between rows becomes smaller. With narrow row spacing the planting arrangement approaches a square configuration and therefore has lower rectangularity.

MATERIALS AND METHODS

The treatments are based on a 4x6 complete factorial with row spacing and various weed control measures as the main factors. Row spacings were 8, 16, 24, and 32 inches between rows. Weed control treatments are summarized in Table 1.

The experimental design was a randomized complete block design with five repetitions. The trial was conducted at the Oregon State University Horticulture Research Farm near Corvallis, Oregon on a Chehalis sandy loam (Cumulic Ultic Haplozeroll) soil. Snap beans 'Oregon 91G' were planted on June 27, 1991 in soil

Table 1. Weed control treatments.

Treatment Name	Weed Control Treatment
Weeded	Maintained weed-free throughout trial by handweeding.
Weeded 3	Maintained weed-free by handweeding starting 3 weeks after crop emergence.
Cultivation	Cultivated once between rows using a small push cultivator.
Interplant	EPTC (Eptam) applied preplant incorporated at 4 lbs ai/A. Four weeks after crop germination, seeds of sudan grass 'Trudan' and common vetch were sowed over the plot.
Metolachlor	Metolachlor (Dual) applied preemergence at 2 lbs ai/A.
Unweeded	No weed removal.

pretreated with fonofos (Dyfonate) at 2 lbs ai/A and 12-29-10-8 fertilizer broadcasted at 775 lbs/A. Plot sizes were 11'x 16'. Each plot was planted with 147.6 g of bean seed, thereby keeping the number of bean seeds per plot nearly constant. Beans were harvested on August 28th and 29th. To harvest equal numbers of plants, the middle portions of the middle rows of each plot were selected as follows: for 32 in. row spacing, 2 rows each of 10 ft. length; 24 in. row spacing, 3 rows each of 8.9 ft. length; 16 in. row spacing, 4 rows each of 10. ft. length; and for 8 in. spacing, 8 rows each of 10 ft. length. Bean plants and weeds were pulled gently from the soil. Soil was removed from roots and beans were picked from the vines. Fresh weights of beans, bean vines, and weeds were taken in the field. Yields were adjusted to reflect treatment effects on maturity by correcting to a standard of 50% beans of 1-4 sieve size. Incidence of white mold infection was determined at time of harvest. Counts were made and percentages of infected plants (designated as whole plants) and pods were calculated. In some cases data were transformed to satisfy ANOVA assumptions (normality and homogeneity of variance). Reported values are means of the untransformed data.

SUMMARY OF RESULTS

The predominant weed species were redroot pigweed, hairy nightshade, and lambs-quarter.

The 1991 data indicate that beans are not competitive with the first flush of weeds (those that germinate with the beans). However, beans can compete with later weed flushes if the first flush is removed (Tables 2, 3, and 4). Table 2 shows that the adjusted yields of the weeded 3 treatment did not differ from the weeded and metolachlor treatments at all row spacings and the interplant treatment at the three wider row spacings.

Table 2. Results of the Weed Control Treatment x Row spacing treatment interaction with respect to adjusted bean yield (Tons/A) (p=0.0097).

	Row Spacing Treatments (inches)			
Weed Treatments	8	16	24	32
Weeded	12.8 ab	13.0 ab	11.6 abcd	10.9 bcd
Weeded 3	13.1 bc	10.8 bcd	10.7 bcd	10.9 bcd
Cultivation	11.0 bcd	12.3 ab	10.2 bcd	10.9 bcd
Interplant	14.6 a	11.3 abcd	10.8 bcd	9.9 cd
Metolachlor	12.6 ab	11.5 abcd	12.1 abc	11.8 abc
Unweeded	9.3 de	7.5 e	7.6 e	4.5 f

The adjusted yields of the cultivation treatment were significantly[1] lower than interplant at the 8 inch row spacing. This could be due to mechanical damage to roots with the cultivator or due to the presence of weeds within the bean row. Table 3 shows that bean plant biomass in the weeded 3 treatment did not differ from any of the weed control treatments but did significantly differ from the unweeded treatment. Table 4 shows weed biomass in the weeded 3 treatment did not differ from any of the weed control treatments but did differ from the unweeded treatment. These results concur with 1990 results.

Table 3. Weed control treatment effect on bean plant biomass.

Weed Control Treatments	Bean Plant Biomass (Tons/A)
Weeded	23.3 ab
Weeded 3	22.1 ab
Cultivation	21.3 b
Interplant	22.6 ab
Metolachlor	23.8 a
Unweeded	14.3 c

Table 4. Weed control treatments effect on weed biomass.

Weed Control Treatments	Weed Biomass (Tons/A)
Weeded	0.5 ab
Weeded 3	0.6 ab
Cultivation	5.1 b
Interplant	1.2 ab
Metolachlor	0.5 ab
Unweeded	18.5 c

The 1991 data indicate that decreasing rectangularity enhances a bean planting's ability to compete with weeds (Table 2 and 5). Table 2 shows that the adjusted yield of beans in the unweeded treatment decreases as rectangularity increases. The adjusted yield of the interplant treatment is higher in the narrow row spacing than at the three

[1]This term indicates that differences between treatment means are due (with 95% probability) to treatment effects and not to random variation.

increase as row spacings decrease. Table 5 shows that weed biomass increased as row spacing increased. Contrast analysis shows that this is a strong trend (p=0.0001). This higher row spacings. Since the interplant plots were weed free, the results may concur with the findings of Mack and Hatch, 1968; and Mhaka and Mack, 1989, that yields result was not observed in the 1990 trial in which decreasing rectangularity did not increase competitiveness of beans.

Table 5. Row spacing effect on weed biomass.

Row Spacing (inches)	Weed Biomass (Tons/A)
8	3.2
16	3.2
24	6.5
32	4.7

The 1991 data indicate that white mold incidence on plants (whole plant) does not increase as rectangularity decreases in all weed control treatments except the metolachlor treatment (Table 6). The cause of this metolachlor effect is not apparent to the authors. There was no whole plant white mold incidence in the unweeded treatment at 16 inches. This may be the result of weeds holding the bean plants above the soil surface. The treatments had no effect on the incidence of white mold on the bean pods (row spacing x weed treatment interaction, p=0.3621; row spacing main effect, p=0.7039; and weed treatment main effect,p=0.4386). Gray mold was not seen in the trial.

Table 6. Weed treatment x row spacing interaction effects on whole plant, white mold incidence (percent infected plants) (p=0.0688).

Weed Treatments	Row Spacing Treatments (inches)			
	8	16	24	32
Weeded	10.0 bc	35.0 abc	15.0 abc	17.5 abc
Weeded 3	12.0 bc	30.0 abc	22.0 abc	27.5 abc
Cultivation	10.0 bc	45.0 ab	25.0 abc	40.0 ab
Interplant	65.0 a	20.0 abc	27.5 abc	45.0 ab
Metolachlor	62.5 a	65.0 a	45.0 ab	2.5 bc
Unweeded	2.5 bc	0.0 c	45.0 ab	37.5 abc

Literature Cited

1. Mack, H. J. and D. L. Hatch. 1968. Effects of Plant Arrangement and Population Density on Yield of Bush Snap Beans. Proc. Amer. Soc. Hort. Sci. 92:418-425.

2. Mhaka, A. G. and H. J. Mack. 1989. Double-row Spacing Results in Higher Yields of Bush Green Beans. HortScience 24:515.

Alternatives to Dinoseb in Snap Bean Production
Line Source - Water Activation Study 1991

D. Boquist, G. Crabtree, and R. William
Oregon State University, Department of Horticulture

A research trial begun in 1988 at the OSU Vegetable Farm has been repeated each year since to study herbicide-water interactions through a line source irrigation technique. The objective has been to better understand the activity and efficacy of several herbicides within preferred planting practices (planting to moisture and delaying irrigation for optimum early bean growth which also postpones weed emergence).

Water gradients (through overhead irrigation) were established over 9 weed control treatments (Table 1) within snap beans. Activation water was applied in two timings, 24 hours and 2 weeks following herbicide application. Activation water was measured during applicaton and divided into 5 levels ranging from 1 inch 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.

Data are currently being analyzed for statistical review. However the following trends were evident from visual evaluations.

Cobra (lactofen) applied with delayed irrigaton or up to 3/4" of irrigation/precipitation immediately following application exhibited minimal or no symptoms (leaf crinkling) and excellent weed control. Significant damage and diminished weed control activity was seen in isolated areas with moisture above 3/4" immediately after application which may be related to planting depth, organic matter, or volatility (a phenomenon suspected in 1990 causing decreased weed control within excessively irrigated plots accompanied with high temperatures). As in previous years, Dual weed contol performance improved with increasing water.

Final results of the line source irrigation/herbicide activation trial are currently being analyzed and will be compiled with the four previous years.

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

LINE-SOURCE/WATER ACTIVATION STUDY IN SNAP BEANS

PROJECT TYPE (H/I etc): PROJECT NO.: TRIAL ID.:
EXPT. LOCATION:CORVALLIS/BENTON,
RESEARCH BY:BOQUIST/WILLIAM LAST UPDATE:02/13/92 INITIATED:07/23/91
PLOT SIZE/Ft:8 x 50 EXPT. STATUS: EXPT. DESIGN:RCBD
SPRAYER OUTPUT APPL#1:27.78 GPA SPRAY MIX SIZE: .25 Gallon(s)

TRT. NUM.	COMPOUND TESTED	FORMUL. AI/UNIT	RATE LBai/A	ML|GR per MIXorPLOT	APPLIC. TYPE	PLOT NUMBERS BY REP 1	2	3	4
01A	COBRA	EC 2.00	0.25	4.2578 ml/M	PRE	101	204	302	403
02A	DUAL	EC 8.00	2.00	8.5156 ml/M	PRE	102	201	306	404
03A	DUAL	EC 8.00	2.00	8.5156 ml/M	PPI	103	207	301	409
04A	DUAL	EC 8.00	2.00	8.5156 ml/M	PRES	104	202	307	401
05A	TREFLAN	EC 4.00	0.75	6.3867 ml/M	PPI	105	209	304	402
05B	EPTAM	EC 7.00	3.50	17.031 ml/M	PPI				
05C	DUAL	EC 8.00	2.00	8.5156 ml/M	PPI				
06A	COBRA	EC 2.00	0.25	4.2578 ml/M	PRE	106	206	303	408
06B	EPTAM	EC 7.00	3.50	17.031 ml/M	PPI				
07A	COBRA	EC 2.00	0.25	4.2578 ml/M	PRE	107	203	309	407
07B	DUAL	EC 8.00	2.00	8.5156 ml/M	PRE				
08A	HANDWEED					108	205	308	405
09A	CHECK					109	208	305	406

LINE-SOURCE/WATER ACTIVATION STUDY IN SNAP BEANS

PROJECT TYPE (H/I etc): PROJECT NO.: TRIAL ID.:
CITY/COUNTY:CORVALLIS/BENTON ST: ZIP: COUNTRY:
RESEARCH BY:BOQUIST/WILLIAM LAST UPDATE:02/13/92 INITIATED:07/23/91
COOPERATOR :OSU VEG FARMS EXPT. STATUS: COMPLETED: / /
REPORTED BY:BOQUIST RELATED FILE:**NONE** SOURCE:

PREVIOUS CROP: PLOT / Ft:8 x50 ROW WIDTH/In:30
PREVIOUS TILL: SOIL TEXTURE:SANDY LOAM OM%:1.13
CEC:0 %SAND:52 %SILT:32 %CLAY:16 pH:6.1

PREVIOUS TRT.:PRIOR CROP CAULIFLOWER AND BROCCOLI EXPT. DESIGN:RCBD
FERTILIZER :12-29-10, 455 LBS/A NUM. OF REPS:4
MISC. INFO. :PRE-IRRIGATED 7/15-16, DYFONATE 7/22 REPORT TYPE:INTERIM

CROP:BEANS VARIETY:OR 91G
PLANTING DATE:07/23/91 DEPTH/In:1.5-2" SPACING/In:1.5-2" NUM.PLANTS:
HARVEST DATE :09/26/91 SEASONAL RAINFALL DURING EXPERIMENT
RESIDUE TAKEN: EARLY:LT MID: LATE:

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

LINE-SOURCE/WATER ACTIVATION STUDY IN SNAP BEANS

** SET 1 OF 1 ** GEN. APPLIC. TYPE	APPLIC. 1 PPI	APPLIC. 2 PRE	APPLIC. 3	APPLIC. 4	APPLIC. 5
APPLICATION DATE	07/23/91	07/24/91	/ /	/ /	/ /
JULIAN DATE/YEAR	J204/91	J205/91	J /	J /	J /
START HR / END HR	09:15/09:45	20:15/20:50	: / :	: / :	: / :
APPLIC. METHOD	BROADCA	BROADCA			
AIR/SOIL TEMP (F)	83 / 74	70 / 65	0 / 0	0 / 0	0 / 0
% REL. HUMIDITY	55	66	0	0	0
WIND DIR. / VELOC	0 / 0	W / 5	/ 0	/ 0	/ 0
SKY / SOIL COND.	CLEAR/SCLOD	NIGHT/SCLOD	/	/	/
SOIL/LEAF MOIST.	DRY /	DRY /	/	/	/
INCORP. EQUIPMENT					
INCORP. DEPTH(in)	0	0	0	0	0
SPRAYER TYPE	CO2 UNICYCL	CO2 UNICYCL			
SPRAYER GPA / PSI	27.78 / 30	27.78 / 30	0 / 0	0 / 0	0 / 0
MIX SIZE (Gallon)	0.25	0.25	0	0	0
NOZZLE TYPE /NUM.	8004/5	8004/5			
RAINFALL/IRRIG.in					
0-24 HR/1-3 DAYS	/	/	/	/	/
4-7 DAYS/2ND WEEK	/	/	/	/	/
3RD WEEK/4TH WEEK	/	/	/	/	/

Research Report
Lactofen for Weed Control in Peas (Succulent and Dry)
IR-4 Pea Trials 1991

Study Director: Ray D. William, Oregon State University
Principle Investigators: Debra Boquist, R. D. William, Oregon State University
Dan Ball, Oregon State University - Hermiston
Chris Boerboom, Washington State University
Gordon Harvey, University of Wisconsin
Ed Beste, University of Maryland
Leonard Hertz, University of Minnesota
Robin Bellinder, Cornell University, New York
Harry Agamalian, University of California

Tolerance and efficacy trials evaluating preemergence applications of lactofen 2 EC (Cobra) on peas (succulent and dry) were established in the Willamette Valley, the mid-Columbia region of Oregon, the Palouse region of eastern Washington, Maryland, Minnesota, Wisconsin, and California. Residue samples were submitted to IR-4 from Oregon (Willamette Valley), Maryland, Minnesota, Wisconsin, and California with additional residue trials scheduled in New York in 1992.

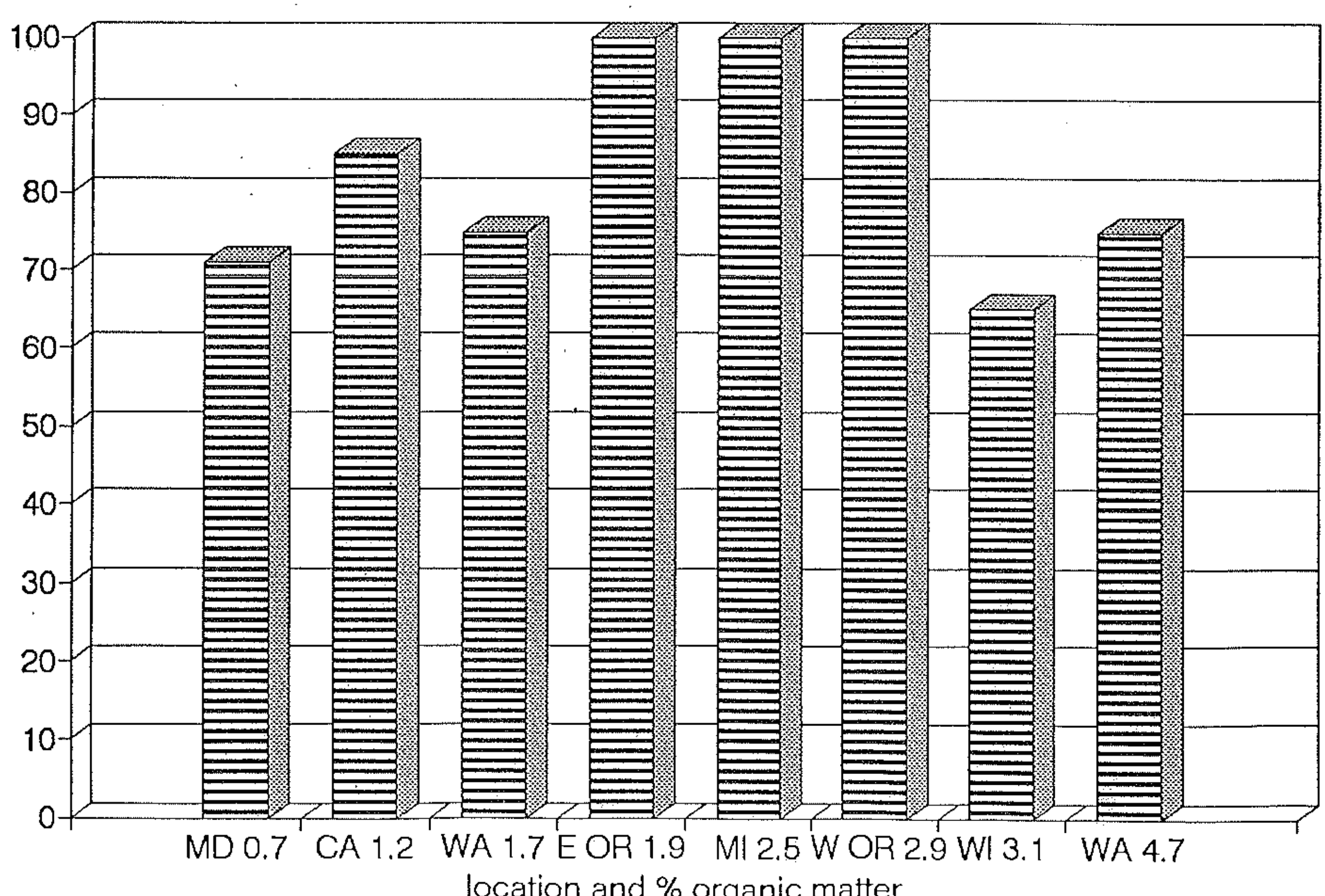
Cobra provides excellent preemergence control at 0.25 lbs ai/A of both hairy and cutleaf nightshade, pigweed, and various other broadleaf species, although it does not control chickweed, knotweed, smartweed, annual bluegrass and other grasses.

Response of both dryland and succulent peas differed between regions. Sites varied dramatically in regards to precipitation and organic matter content of soils, providing opportunity to discover some aspects of injury potential. Although a range of rates from 0.05 to 0.50 lbs ai/A were included at several sites, primary focus centered on 1x and 2x rates of 0.25 and 0.50 lbs ai/A required for residue analysis. Peas tolerated 0.25 lbs ai/A Cobra applied directly following planting in Minnesota and the Willamette Valley in Oregon. Tolerance to lower rates of 0.05 to 0.20 lbs ai/A was demonstrated in dryland peas in the mid-Columbia region of Oregon. In both California and Maryland trials where organic matter contents were 1% and 0.7%, respectively, limited tolerance was experienced. Significant injury was seen in Wisconsin and the Palouse region of eastern Washington (lower rates of 0.10 to 0.25 lbs ai/A were applied in eastern WA).

In the Willamette Valley, trials were established in plantings throughout the season and included soil types with organic matter at 2-3%. Early plantings received 2 to 3.5" rainfall within the first 2-3 weeks, whereas later trials received 1 to 2" within the first 3 weeks. Although early visual evaluations recorded some stand reduction, plant counts/m2 and harvest weights indicate there was no significant stand or yield reduction when peas were treated preemergence with 0.25 lbs ai/A. California trials exhibited initial pea suppression when treated with 0.25 lbs ai/A. Although plants recovered from these symptoms, harvest was delayed due to immaturity. Maryland trials included tolerance evaluations of short and long season varieties, and immediate versus delayed applications. Both varieties exhibited early phytotoxicity and stand reduction although neither experienced significant reduction of shelled pea weights at harvest. A comparison of biomass and field weights at harvest indicates the longer season variety may experience more tolerance due to a longer recovery period. In general, peas grown in the low organic matter soils of Maryland were injured when applications were delayed 6-7 days after planting. It was also noted that a prolonged wet period at emergence increased injury. In Wisconsin, Cobra applied to soils with organic matter as high as 3% and minimal precipitation significantly injured peas. Lower rates of 0.10 and 0.20 lbs ai/A were evaluated in peas grown in the Palouse region of eastern Washington and the mid-Columbia region of Oregon. Two trials were established in the Palouse region at sites with 1.7% and 4.7% organic matter. Both experienced significant injury, although less injury was seen in the higher organic matter soil. In contrast, peas treated with similar rates and organic matter content in the mid-Columbia region of Oregon showed only marginal injury symptoms initially, and recovered with no reduction in harvest weights.

Additional study is required to better understand variables associated with potential injury. Factors include soil types, organic matter, seed coverage, prolonged wet periods at planting or emergence, and volatility.

Relative Stands of Peas
treated with Cobra at 0.25 lbs ai/A



Preemergence Weed Control in Succulent Peas with Cobra (lactofen)

D. Boquist and R. D. William, Department of Horticulture
Robert L. Rackham, Benton County Extension
Oregon State University

Six pea trials were conducted in the Willamette Valley in 1991 to evaluate pea tolerance to preemergence applications of Cobra (lactofen). Lactofen 2 EC was applied as a broadcast preemergence application 24 to 48 hours after planting. Plantings were staggered over the season with the earliest planting sown 2/28 and the last sown 5/02. Rates included 0.125 lbs ai/A (1/2 pint/A), 0.187, 0.25, 0.375, and 0.50 lbs ai/A. A postemergent application of Basagran at 0.50 lb ai/A + MCPA at 0.125 lb ai/A was included in all trials as a standard in addition to an untreated control plot. Treatments were designed in a randomized complete block with 4 replications. The earliest planting received 3.84" of rainfall within the first 2-3 weeks. All others received 1-2" within the first 3 weeks. Soil classifications included both a silty clay loam and a loam soil with organic matter ranging from 2.48% to 2.99%.

Treatments were evaluated visually for stand reduction and/or injury, and quantitatively for stand (number of plants/m2), and yield. Harvest weights/m2 included total biomass, weeds, pod weight, and shucked pea weight. Maturity level was evaluated based on weight ratios of shucked peas to pods.

Visual evaluations at 1 to 2 months after application indicate some degree (10% to 31%) of stand reduction was seen in 3 of the 4 harvested trials at the 1x rate of 0.25 lbs ai/A. Two additional trials established in a low, wet, and/or comapcted areas exhibited a 60% and 19% stand reduction. These trials was not harvested due to an overall poor stand in both fields. Plant counts/m2 and harvest weights indicate no significant reduction in stand or yield in any of the harvested trials. The 2x rate of 0.50 lbs ai/A did significantly reduce stands and yield, with slightly more injury seen in trials experiencing heavier rainfall within the first 3 weeks. There does appear to be some margin of safety with the 0.375 lbs ai/A rate. Maturity indices were similar between treatments.

Pigweed, nightshade, and other broadleaf species control was excellent with the 1x rate, although all rates of Cobra missed chickweed, knotweed, annual bluegrass, and other grass species.

Due to the observance of some initial stand reduction in these trials and injury reports of Cobra injury on peas from other regions (the Palouse, Wisconsin, and Maryland), additional field trials are required to evaluate complete crop tolerance in the Willamette Valley of succulent peas to Cobra.

PEAS1

EXPT. LOCATION:MARION, OR
RESEARCH BY:BOQUIST/WILLIAMS   INITIATED:02/28/91   COMPLETED:06/14/91

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	STAND 0-100% 4/22/91	WEEDS % CNTRL 4/22/91	FIELD WT LBS 6/13/91	# PEA PLANTS 6/14/91	POD WT GRAMS 6/14/91	SHCKD.P WT (GM) 6/14/91	PEAHARV PTOPOOR 6/14/91	WEED WT GRAMS 6/14/91
01	COBRA	EC 2.00	0.125	PRE	73	76	4.97	48	1057	181	.17	4
02	COBRA	EC 2.00	0.187	PRE	73	81	3.79	40	781	119	.15	4
03	COBRA	EC 2.00	0.25	PRE	80	85	4.81	47	953	135	.14	1
04	COBRA	EC 2.00	0.375	PRE	44	89	4.55	47	967	149	.16	4
05	COBRA	EC 2.00	0.50	PRE	20	94	3.50	38	763	121	.16	4
06	BASAGRAN RHOMENE	EC 4.00 SC 4.00	0.50 0.125	POST POST	71	3	4.99	45	1088	201	.18	5
07	CONTROL				78	3	4.63	48	951	166	.17	32
	LSD(0.05) =				32	12	1.00	15	254	80	.05	16
	STANDARD DEVIATION =				21	8	.68	10	171	54	.03	11
	COEFF. OF VARIABILITY =				34	13	15.14	22	18	35	21.56	138

LACTOFEN: MAGNITUDE OF THE RESIDUE ON PEAS (SUCCULENT)

EXPT. LOCATION:CORVALLIS/BENTON, OR
RESEARCH BY:BOQUIST/WILLIAM   INITIATED:04/18/91   COMPLETED:08/01/91

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	P STAND 0-100% 5/09/91	P INJRY 0-10 5/09/91	P INJRY 0-10 6/03/91	P STAND 0-100% 6/20/91	WEED WT GRAMS 7/11/91	FIELD WT LBS 7/10/91	# PEA PLNT/M2 7/11/91	POD WT GRAMS 7/11/91	SHCKD P WT GM 7/11/91	PEAHARV PTOPOOR 7/11/91
01	COBRA	EC 2.00	0.125	PRE	90	0	0	100	4	4.05	45	1059	467	.44
02	COBRA	EC 2.00	0.187	PRE	85	0	0	100	0	3.91	40	1044	481	.46
03	COBRA	EC 2.00	0.25	PRE	84	0	0	100	0	4.54	53	1192	538	.45
04	COBRA	EC 2.00	0.375	PRE	74	1	1	100	0	4.30	41	1164	516	.44
05	COBRA	EC 2.00	0.50	PRE	76	1	1	100	0	4.17	42	1144	559	.49
06	BASAGRAN RHOMENE	SC 4.00 SC 4.00	0.50 0.125	POST POST	93	0	1	100	1	3.86	52	1033	456	.44
07	CONTROL				93	0	0	100	22	4.05	47	1022	451	.43
	LSD(0.05) =				11	0	0	NA	16	1.15	11	324	167	.05
	STANDARD DEVIATION =				7	0	0	NA	11	.77	7	218	112	.03
	COEFF. OF VARIABILITY =				8	92	108	NA	286	18.75	16	20	23	7.19

PEAS 5

EXPT. LOCATION: CORVALLIS/BENTON,
RESEARCH BY: BOQUIST/WILLIAM   INITIATED: 04/16/91   COMPLETED: 07/12/91

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	STAND 0-100% 5/20/91	WEEDS % CNTRL 5/20/91	FIELD WT LBS 7/08/91	WEED WT GRAMS 7/08/91	# PEA PLNT/M2 7/08/91	POD WT. GRAMS 7/08/91
01	COBRA	EC 2.00	0.125	PRE	73	84	4	6	48	819
02	COBRA	EC 2.00	0.187	PRE	61	93	3	7	38	701
03	COBRA	EC 2.00	0.25	PRE	61	91	3	2	37	660
04	COBRA	EC 2.00	0.375	PRE	40	95	4	1	49	798
05	COBRA	EC 2.00	0.50	PRE	31	95	2	9	35	512
06	BASAGRAN	SC 4.00	0.50	POST	88	94	3	15	49	836
	RHOMENE	SC 4.00	0.125	POST						
07	CONTROL				94	23	3	82	34	653
	LSD(0.05) =				18	20	1	66	17	209
	STANDARD DEVIATION =				12	13	1	44	11	141
	COEFF. OF VARIABILITY =				18	16	19	264	28	21

LACTOFEN ON PEAS - TRIAL 6

EXPT. LOCATION: SALEM/MARION,
RESEARCH BY: BOQUIST/WILLIAM   INITIATED: 05/02/91   COMPLETED: 06/21/91

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	STAND 0-100% 5/28/91	BEANS INJURY 5/28/91	FIELD WT LBS 6/19/91	WEED WT GRAMS 6/19/91	# PEA PLNT/M2 6/19/91	PEA POD WT. GM 6/19/91	SHCKD P WT. GM 6/19/91	PEAHARV PTOPOOR 6/19/91
01	COBRA	EC 2.00	0.125	PRE	76	2	3.69	0	52	750	320	.43
02	COBRA	EC 2.00	0.187	PRE	85	1	3.32	0	48	629	260	.41
03	COBRA	EC 2.00	0.25	PRE	73	2	2.97	2	41	599	257	.43
04	COBRA	EC 2.00	0.375	PRE	64	2	3.41	11	49	695	297	.43
05	COBRA	EC 2.00	0.50	PRE	46	3	2.88	2	37	611	254	.43
06	BASAGRAN	SC 4.00	0.50	POST	89	1	3.07	0	51	644	290	.47
	RHOMENE	SC 4.00	0.125	POST								
07	CONTROL				88	1	3.44	17	52	685	310	.46
	LSD(0.05) =				11	1	.75	10	15	148	65	.05
	STANDARD DEVIATION =				7	0	.50	7	10	100	44	.03
	COEFF. OF VARIABILITY =				10	32	15.44	146	22	15	15	7.40

PEAS 2

EXPT. LOCATION:MONROE/BENTON,
RESEARCH BY:BOQUIST/WILLIAM INITIATED:03/05/91

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	STAND 0-100% 4/22/91	WD CTRL 0-100% 4/22/91						
01	COBRA	EC 2.00	0.125	PRE	79	76						
02	COBRA	EC 2.00	0.187	PRE	73	65						
03	COBRA	EC 2.00	0.25	PRE	61	85						
04	COBRA	EC 2.00	0.375	PRE	69	73						
05	COBRA	EC 2.00	0.50	PRE	43	95						
06	BASAGRAN	EC 4.00	0.50	POST	75	14						
	RHOMENE	SC 4.00	0.125	POST								
07	CONTROL				76	18						
				LSD(0.05) =	20	27						
				STANDARD DEVIATION =	13	18						
				COEFF. OF VARIABILITY =	20	30						

PEAS 4

EXPT. LOCATION:,
RESEARCH BY:BOQUIST/WILLIAM INITIATED:04/11/91

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	STAND 0-100% 5/20/91	WD CTRL 0-100% 5/20/91						
01	COBRA	EC 2.00	0.125	PRE	78.8	93.8						
02	COBRA	EC 2.00	0.187	PRE	71.3	95.0						
03	COBRA	EC 2.00	0.25	PRE	55.0	95.0						
04	COBRA	EC 2.00	0.375	PRE	37.5	73.8						
05	COBRA	EC 2.00	0.50	PRE	26.3	73.8						
06	BASAGRAN	SC 4.00	0.50	POST	92.5	80.0						
	RHOMENE	SC 4.00	0.125	POST								
07	CONTROL				46.3	2.5						
				LSD(0.05) =	32.1	35.1						
				STANDARD DEVIATION =	21.6	23.6						
				COEFF. OF VARIABILITY =	37.2	32.2						

Cucurbit Protection by Activated Charcoal when Treated Preemergence with Dual, Devrinol, and Cobra

E. Peachey and R. D. William, Department of Horticulture
Oregon State University

OBJECTIVE

To evaluate the potential of activated charcoal as a seed protectant for cucurbit crops when Dual, Devrinol and Cobra are applied preemerge.

METHODS AND MATERIALS

Cucumber (var. Pioneer), zucchini (var. Elite), and winter squash (var. Golden Delicious) seeds were planted in 5' by 20 ' plots, in 20 inch rows at 2 seeds per foot. In the charcoal treatments, the seed row was covered with a 2 inch band of activated charcoal applied as a slurry at 300 #/acre. One day after planting, Cobra 2EC (lactofen), Devrinol 50WP (napropamide), or Dual 8E (metolachlor) was applied with a CO_2 pressurized unicycle sprayer at 30 psi and 28 gal of water per acre. All the plots were then sprinkle irrigated with 0.5 inches of water. Thereafter, irrigation water was given as needed until harvest. At approximately 30 DAP, ten feet of the middle crop row was cut at the soil surface and weighed. Dry matter content was determined by extrapolating from dried samples. Four replications were included in a RCB design. The experiment was completed twice with planting dates of June 17 and July 31. Tare weights were adjusted for the third and fourth replications of the second planting because of rain which began during harvest.

<u>June 17 Planting</u>

Herbicide Application:
Environmental conditions
- wind: west 10 mph, gusty;
- cloud cover: 90 %
- air temp: 70°F
- soil temp: 65°F.
- soil condition: wet

Time of application: 11:00 to 14:30
Precip.: 1.0 inch one day after planting.
Harvest date: July 17 (30 days)

<u>July 31 Planting</u>

Herbicide Application:
Environmental conditions
- wind: no wind;
- cloud cover: 0%
- air temp: 65°F
- soil temp: 75°F
- soil condition: very dry

Time of application: 7:00 to 9:30
Precip.: None
Harvest date: August 27 (27 days)

CONCLUSION

Activated charcoal protected cucumbers, zucchini and winter squash from the herbicides, but the degree of protection depended on herbicide and rate. On cucumbers, Devrinol at 2.0 #ai/acre with activated charcoal had the highest yield. Charcoal was ineffective in reducing damage with Cobra at 0.50 ai/acre. On zucchini, yields of all treatments were comparable to the control except Cobra with charcoal at 0.5 #ai/acre and Cobra without charcoal at 0.25 # ai/acre which yielded significantly lower than the control. On winter squash differences among treatments were evident only in the first planting; the Cobra treatment at 0.5 #ai/acre gave the lowest yields both with and without activated charcoal.

RESULTS

June 17 Planting

Herbicide	Rate (# ai/acre)	Charcoal	Plant #/plot (July 17)	Dry Matter Yield (g/plot)	Weed Fresh Weight (g/plot)
Cucumber					
Cobra	0.25	n	11.5	12.9	1.5
Cobra	0.25	y	16.8	23.6	11.5
Cobra	0.50	n	3.0	1.2*	2.5
Cobra	0.50	y	12.5	5.9*	11.1
Devrinol	1.00	n	13.5	20.3	9.0
Devrinol	1.00	y	15.0	26.5	26.5
Devrinol	2.00	n	13.8	18.2	6.0
Devrinol	2.00	y	17.0	39.6*	79.0
Dual	2.00	n	11.5	4.2*	8.2
Dual	2.00	y	12.3	16.5	20.7
Dual	4.00	n	6.0	2.9*	1.8
Dual	4.00	y	13.8	17.3	8.9
No herbicide	unweeded	n	12.8	20.9	151.6
No Herbicide	unweeded	y	14.8	28.6	255.7
Control(no herb)	weeded	n	13.0	22.4	0.0
No herbicide	weeded	y	14.3	22.2	0.0
Zucchini					
Cobra	0.25	n	16.8	37.6*	2.3
Cobra	0.25	y	16.5	122.4	2.1
Cobra	0.50	n	5.0	2.7*	0.3
Cobra	0.50	y	17.0	35.0*	1.7
Devrinol	1.00	n	22.3	245.8	12.0
Devrinol	1.00	y	19.0	209.7	32.9
Devrinol	2.00	n	18.8	243.7	6.8
Devrinol	2.00	y	19.0	217.2	24.7
Dual	2.00	n	18.8	143.4	4.4
Dual	2.00	y	18.0	171.5	32.5
Dual	4.00	n	15.5	137.1	38.8
Dual	4.00	y	18.0	149.3	6.8
No herbicide	unweeded	n	16.8	201.7	40.2
No herbicide	unweeded	y	19.0	208.3	127.9
Control(no herb)	weeded	n	18.5	176.1	28.0
No herbicide	weeded	y	20.5	209.7	27.5
Winter squash/pumpkin					
Cobra	0.25	n	19.5	214.0	6.9
Cobra	0.25	y	16.8	207.5	3.4
Cobra	0.50	n	20.5	138.6*	0.0
Cobra	0.50	y	14.8	130.4*	8.7
Devrinol	1.00	n	17.3	262.3	11.8
Devrinol	1.00	y	19.3	262.8	37.0
Devrinol	2.00	n	18.0	262.5	31.1
Devrinol	2.00	y	16.8	230.0	8.6
Dual	2.00	n	16.5	160.1	31.8
Dual	2.00	y	17.8	235.3	85.0
Dual	4.00	n	19.3	160.9	1.2
Dual	4.00	y	18.8	245.4	6.9
No herbicide	unweeded	n	21.3	300.9	93.8
No herbicide	unweeded	y	12.8	251.2	48.3
Control (no herb)	weeded	n	17.0	237.3	2.1
No herbicide	weeded	y	15.3	197.0	0.2

1. Yields followed by (*) differ from the control (p=0.05).
2. The predominant weed in the 'no herbicide' plots was groundsel. Other weeds present included annual bluegrass, pigweed, nightshade and crabgrass.

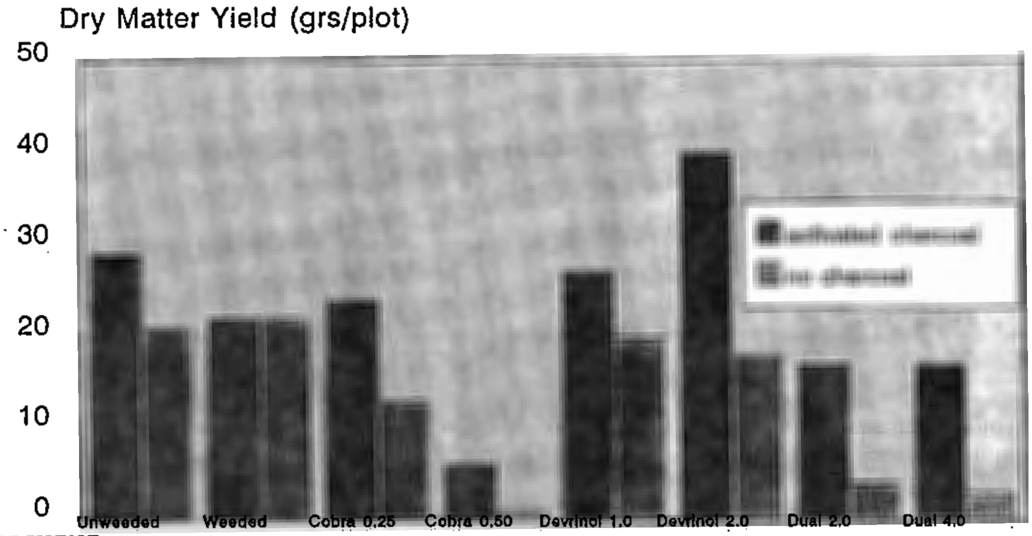
July 31 Planting

Herbicide	Rate (# ai/acre)	Charcoal	Plant #/plot (Aug 27)	Dry Matter Yield[1] (g/plot)	Weed Fresh Weight[2] (g/plot)
Cucumber					
Cobra	0.13	n	20.3	28.0	0.5
Cobra	0.13	y	20.5	28.6	1.4
Cobra	0.25	n	11.5	8.3*	1.3
Cobra	0.25	y	18.0	15.1	1.8
Devrinol	1.00	n	20.3	46.1	2.4
Devrinol	1.00	y	24.5	56.5	6.1
Devrinol	2.00	n	20.0	33.1	3.8
Devrinol	2.00	y	15.0	46.7	2.9
Dual	2.00	n	15.3	24.8	0.9
Dual	2.00	y	17.8	32.4	13.4
Dual	4.00	n	14.8	18.8	1.6
Dual	4.00	y	20.5	34.8	3.4
No herbicide	unweeded	n	18.5	39.0	19.2
No herbicide	unweeded	y	14.3	46.1	31.8
Control (no herb)	weeded	n	14.8	41.8	5.7
No herbicide	weeded	y	19.0	53.9	5.5
Zucchini					
Cobra	0.13	n	17.5	168.3*	3.3
Cobra	0.13	y	19.8	281.4	0.7
Cobra	0.25	n	16.3	63.7*	1.6
Cobra	0.25	y	16.8	88.5*	4.8
Devrinol	1.00	n	17.8	251.0	2.9
Devrinol	1.00	y	17.3	304.4	1.5
Devrinol	2.00	n	19.8	312.4	1.6
Devrinol	2.00	y	19.3	262.8	19.3
Dual	2.00	n	17.8	272.8	3.0
Dual	2.00	y	18.0	260.0	1.8
Dual	4.00	n	17.0	244.6	0.5
Dual	4.00	y	19.8	273.5	0.9
No herbicide	unweeded	n	20.0	319.6	8.7
No herbicide	unweeded	y	20.3	300.1	13.0
Control (no herb)	weeded	n	21.0	341.3	22.4
No herbicide	weeded	y	18.5	285.0	12.0
Winter squash/pumpkin					
Cobra	0.125	n	19.8	238.5	2.0
Cobra	0.125	y	19.3	258.2	0.9
Cobra	0.25	n	14.8	201.4	1.3
Cobra	0.25	y	13.3	178.2	0.1
Devrinol	1.00	n	15.3	282.5	3.3
Devrinol	1.00	y	18.0	291.6	6.4
Devrinol	2.00	n	18.5	336.9	2.1
Devrinol	2.00	y	16.3	259.4	2.4
Dual	2.00	n	17.3	256.0	0.3
Dual	2.00	y	20.5	306.1	3.7
Dual	4.00	n	17.8	254.7	0.2
Dual	4.00	y	20.3	348.8	0.8
No herbicide	unweeded	n	18.3	245.4	6.1
No herbicide	unweeded	y	16.5	325.4	31.9
Control (no herb)	weeded	n	14.0	249.6	4.9
No herbicide	weeded	y	14.5	240.5	2.9

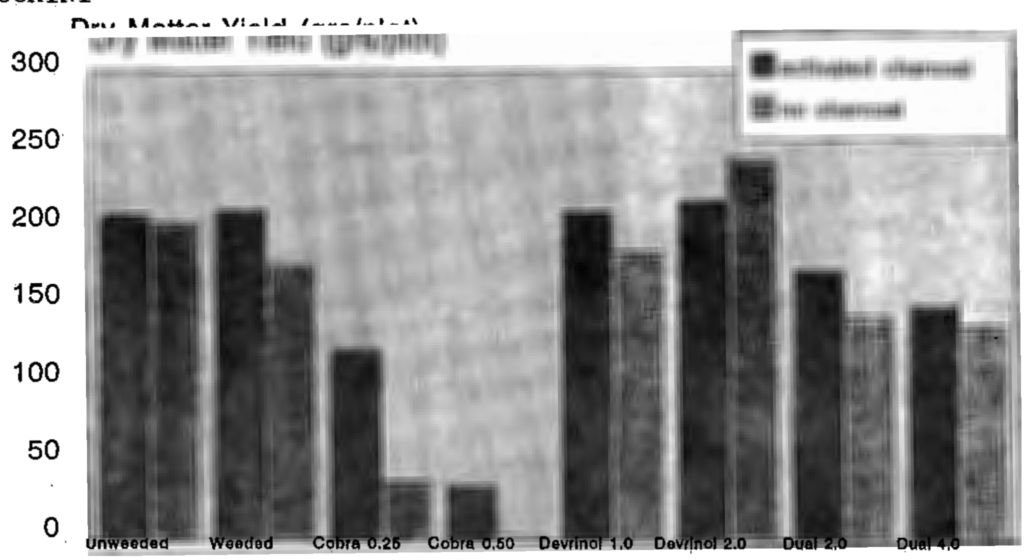
1. Values designated by (*) differ from the control (p=0.05)
2. The predominant weed in the 'no herbicide' plots was groundsel. Other weeds included speedwell, and pigweed.

EFFECT OF ACTIVATED CHARCOAL ON YIELD OF CUCURBITS
Planting Date: June 17, 1991

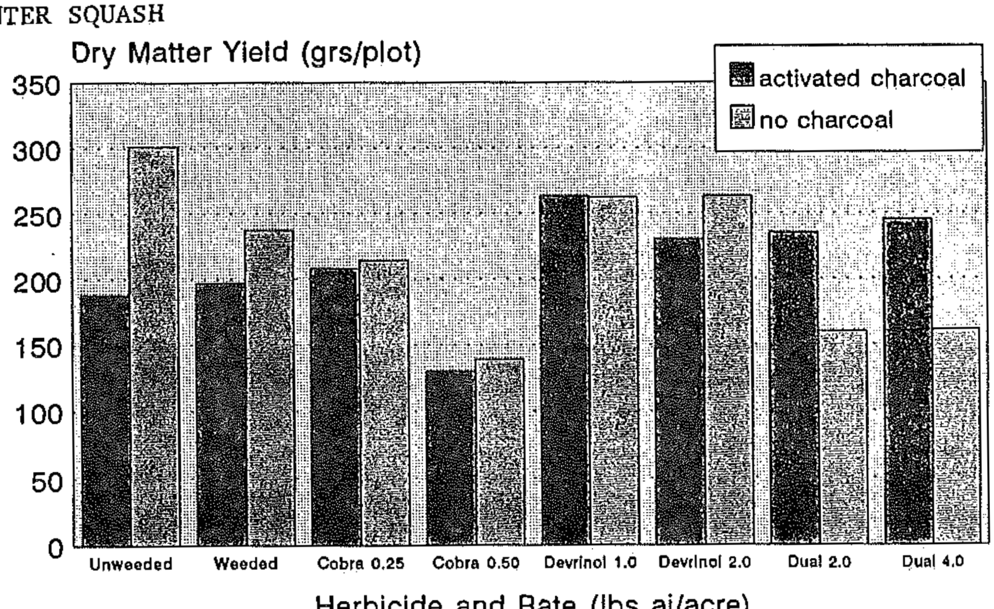
CUCUMBERS



ZUCCHINI



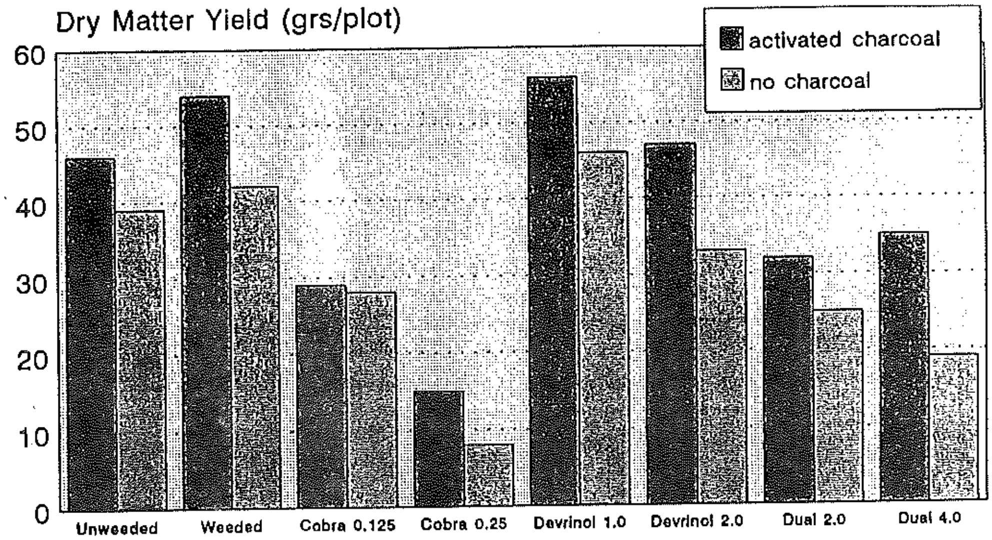
WINTER SQUASH



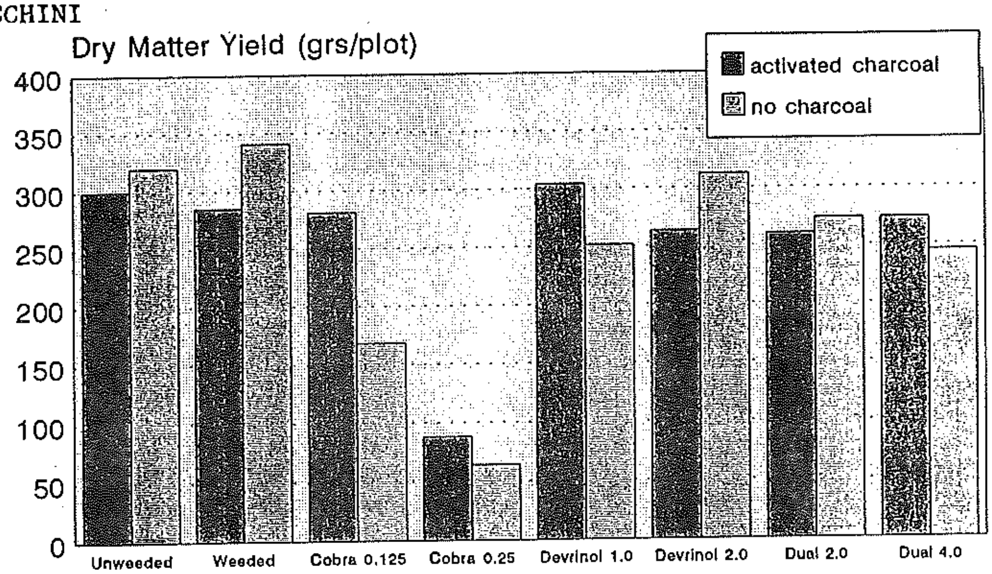
Planting date: June 17
Weeded and unweeded plots not treated with herbicide

EFFECT OF ACTIVATED CHARCOAL ON YIELD OF CUCURBITS
Planting Date: July 31, 1991

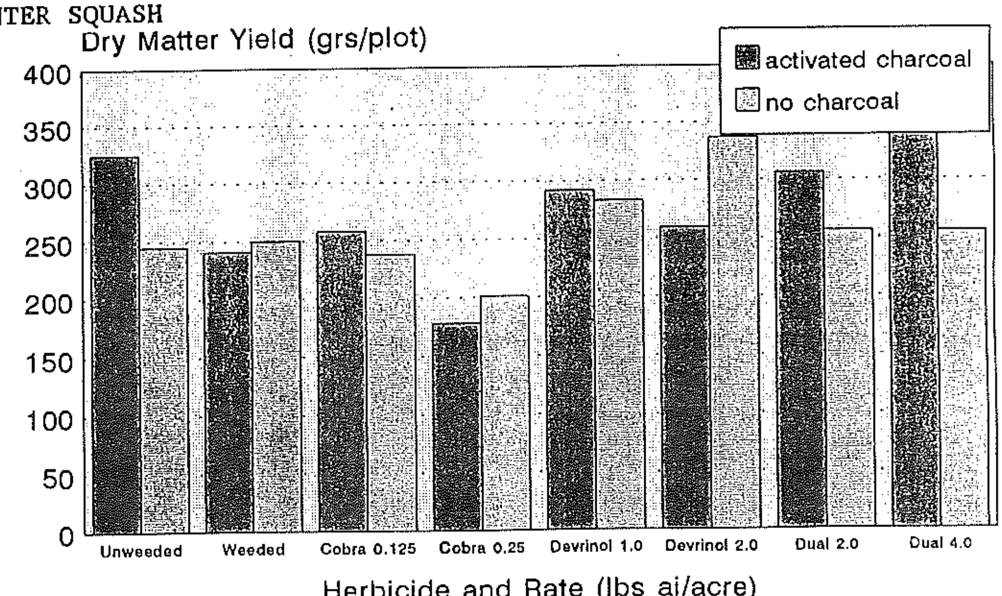
CUCUMBERS



ZUCCHINI



WINTER SQUASH



Planting date: August 1, 1991
Weeded and unweeded plots not treated with herbicide

Screening vegetables for phytotoxicity to BAS 56216H. McReynolds, R.B., C. Ishida and L. Darlington. Field trials were established in selected vegetables in order to screen a new formulation of sethoxydim, BAS 56216H, for phytotoxicity. Sethoxydim, BAS 90526H, was included in the trials in order to compare the new formula to the performance of a known standard. All the trials were located in production fields.

Trials were established in snap beans, green peas, broccoli, zucchini squash, pumpkin, carrots and onions at various locations in the Willamette Valley of Oregon. Trial sites were selected based upon the uniformity of crop growth rather than for the presence of grassy weeds. Herbicide treatments were applied with a CO_2 powered backpack sprayer set at 241 KPa pressure. The spray boom was equipped with four 8002 flat fan nozzles spaced at either 30 cm or 48 cm depending upon the plot dimensions. The total spray solution volume for each treatment of 750 ml was applied broadcast over the top of the crop. All trials were randomized complete block design with three replications. Visual observations for phytotoxicity symptoms were made following both applications. Yield data were not collected.

Table 1. Herbicide treatments and application times

Treatment	Rate kg ai/ha	Application time
1. Untreated	---	---
2. BAS 56216H	3.36	Post-emergence
3. BAS 56216H +	3.36	Post-emergence
BAS 81525S	1.16 l/ha	
4. BAS 56216H +	3.36	Post-emergence
COC[a]	2.32 l/ha	
5. BAS 56216H	3.36	Post-emergence
2nd application		14-21 days later
6. BAS 56216H +	3.36	Post-emergence
BAS 81525S	1.16 l/ha	
2nd application		14-21 days later
7. BAS 905261H +	3.36	Post-emergence
COC	2.32 l/ha	
2nd application		14-21 days later

[a]Crop oil concentrate

Phytotoxicity was not observed in any crops following the first herbicide applications. However, minor phytotoxicity symptoms were observed in onions and green beans following the second application of BAS 56216H in combination with BAS 81525S, a new crop oil formulation. It was expressed on the onions as a slight twisting and yellowing at the base of the youngest leaves. Phytotoxicity was exhibited on green beans as a bronzing on the leaves. Phytotoxicity was not observed in any of the other trials.

The results demonstrated that single applications of BAS 56216H provide acceptable levels of safety for the crops included in these trials. Two applications of BAS 56216H combined with BAS 81525S or COC also exhibited good safety, except on onions and green beans. However, before final conclusions are made regarding any of these crops, trials should be conducted to measure the herbicide effect on yields.

The cause of the phytotoxicity in beans and onions needs to be investigated further. Additional trials should include the treatments, BAS 81525S applied twice, as well as, BAS 56216H + COC applied twice, in order to determine if the phytotoxicity is caused by BAS 81525S alone, by a reaction of the new formulation with the oil or because of conditions at the time of application.

(North Willamette Research & Extension Center, Oregon State University, Aurora, OR 97002)

Table 2. Phytotoxicity ratings[b]

Crop	Variety	Treatment Number						
		1	2	3	4	5	6	7
Green beans	Easy Pick	0	0	0	0	0	3	0
Green peas	Misty	0	0	0	0	0	0	0
Onions	Cache	0	0	0	0	0	3	0
Carrots	Top Pack	0	0	0	0	0	0	0
Broccoli	Gem	0	0	0	0	0	0	0
Squash	Midnight	0	0	0	0	0	0	0
Pumpkin	Spooky	0	0	0	0	0	0	0

[b]Phytotoxicity, 0 = no injury, 10 = plant death. Ratings are the average of 3 replicates.

Table 3. Herbicide application data, green beans

	1st Application	2nd application
	6/24	7/17
Growth stage	2-3 leaf	1st flower
Date of rating	7/2	7/26
Air temperature (F)	64	70
Cloud cover (%)	100	0
Wind (mph) direction	2 E	4 S
Relative humidity (%)	75	64
Soil surface	moist	dry
Soil temperature (F)	65	70
Rows/treatment	2	
Treatment area	25.1 m^2	

Table 4. Herbicide application data, carrots

	1st application	2nd application
	6/5	6/25
Growth stage	2-3 leaf	5-7 leaf
Date of rating	6/15	7/2
Air temperature (F)	70	64
Cloud cover (%)	70	100
Wind (mph) direction	5 W	0
Relative humidity (%)	64	80
Soil surface	moist	wet
Soil temperature (F)	70	65
Rows/treatment	4	
Treatment area	33.5 m^2	

Table 5. Herbicide application data, green peas

	1st application	2nd application
	5/6	5/20
Growth stage	20-25 cm	1st tendrils
Date of rating	5/14	6/3
Air temperature (F)	61	55
Cloud cover (%)	100	100
Wind (mph) direction	3-5 W	0-1 E
Relative humidity (%)	92	99
Soil surface	moist	wet
Soil temperature (F)	----	55
Rows/treatment	8	
Treatment area	33.5 m^2	

Table 6. Herbicide application data, broccoli

	1st application	2nd application
	6/24	7/17
Growth stage	4-5 leaf	buds
Date of rating	7/1	7/26
Air temperature (F)	60	69
Cloud cover (%)	100	90
Wind (mph) direction	4 E	0
Relative humidity (%)	89	76
Soil surface	wet	wet
Soil temperature (F)	----	62
Rows/treatment	4	
Treatment area	25.1 m^2	

Table 7. Herbicide application data, bulb onions

	1st application	2nd application
	5/30	6/24
Growth stage	2-3 leaf	4-5 leaf
Date of rating	6/3	7/2
Air temperature (F)	58	64
Cloud cover (%)	85	100
Wind (mph) direction	4 E	7 E
Relative humidity (%)	84	75
Soil surface	wet	wet
Soil temperature (F)	56	64
Rows/treatment	4	
Treatment area	25.1 m^2	

Table 8. Herbicide application data, pumpkin

	1st application	2nd application
	7/3	7/17
Growth stage	4-7 leaf	1 m runner
Date of rating	7/14	7/26
Air temperature (F)	92	73
Cloud cover (%)	0	100
Wind (mph) direction	4-6 S	0
Relative humidity (%)	38	64
Soil surface	dry	moist
Soil temperature (F)	79	70
Rows/treatment	1	
Treatment area	25.1 m^2	

Table 9. Herbicide application data, zucchini squash

	1st application	2nd application
	7/5	7/17
Growth stage	8-10 leaf	1st flower
Date of rating	7/14	7/26
Air temperature (F)	69	75
Cloud cover (%)	25	100
Wind (mph) direction	2 SW	0
Relative humidity (%)	71	64
Soil surface	dry	moist
Soil temperature (F)	60	70
Rows/Treatment	1	
Treatment area	25.1 m^2	

Pyridate WP phytotoxicity in dry bulb onions. McReynolds, Robert B. Field trials conducted in bulb onions in 1990 with the EC formulation of pyridate resulted in severe crop injury and stand reductions. Greater crop safety has been reported with the wettable powder formulation. Therefore, phytotoxicity of the wettable powder was evaluated on onions grown in mineral soil in western Oregon in 1991.

A randomized complete block trial with four replications was established on May 31 in a production field of "Cache" bulb onions direct-seeded on April 21. The pyridate treatments were applied with a CO_2-powered backpack sprayer at 241 kPa pressure. The spray boom was equipped with four 8002 flat fan nozzles, spaced at 30.5 cm. Replicate size was 6.1 m x 1.32 m and consisted of four rows of onions spaced 33 cm apart. Carrier volume was 308 l/ha. The treatments were applied broadcast to a moist soil surface at the 1 to 2 true leaf stage of crop growth and the 3 to 4 leaf stage for the weeds. The primary weed species present was a prostrate ornamental which had spread into the field from a nearby garden. Weed densities were approximately 1/30 cm^2. Weeds were allowed to grow in the untreated control for 21 days before they were cultivated.

The plot was evaluated for phytotoxicity two weeks after herbicide applications. Crop injury at both rates of pyridate was observed on the onions as leaf tip burn and more severely as wilting of the plants. Many of the injured onions did not recover and died within two weeks. The plot was maintained by the grower for the remainder of the season and was managed following practices common for the area. The onions were lifted on September 5, and field cured for one week. Following field curing, the onions were weighed and the number of onions per plot was recorded. Total yield, bulb number and mean bulb weight were analyzed using an ANOVA.

Results from the ANOVA showed significant decreases in bulb number and mean bulb weight at both rates of pyridate. These two components of yield contributed to a significant decrease in total yield in comparison to the untreated and hand weeded controls. Mean bulb weight, bulb number and total yield did not vary significantly between the 0.50 and the 1.0 kg ai/ha rates.

Based upon the results from this trial, pyridate WP at rates of 0.50 kg ai/ha or higher are not safe for use in onions in western Oregon. These results are consistent with those obtained with the EC formulation in 1990. Additional field studies are required to establish the threshold for onion damage selectivity in onions. (North Willamette Research & Extension Center, Oregon State University, Aurora, OR 97002)

Pyridate effects on bulb onion yields in western Oregon[a]

Rate kg ai/ha	Yield kg/32.2m²	Bulbs/32.2m²	Mean weight kg/bulb
Untreated	55.8 a	242 a	0.23 a
Hand weeded	51.2 a	227 a	0.22 a
0.50 WP	34.1 b	193 b	0.19 b
1.00 WP	30.9 b	163 b	0.19 b
LSD (0.05)	10.5	28	0.02

[a] Values followed by the same letter are not significantly different at the 5% level.

Clopyralid for Weed Control in Strawberries

D. Boquist, S. Eskelsen, and G. Crabtree
Department of Horticultrue, Oregon State University

Two trials were conducted in 1991 to evaluate crop tolerance and weed control with clopyralid in strawberries on both an established planting ('Benton') and a new planting ('Totem'). Clopyralid applications were applied either as fall or spring treatments at rates of 0.062, 0.125, and 0.25 lbs ai/A. Fall treatments were applied in July 1990 after bed renovation with spring treatments applied in March of 1991. Both trials were harvested during June of 1991. At this point the trial evaluating the established or 'Benton' planting was completed. The 'Totem' trial was retreated in September of 1991 and is scheduled for continuation through the 1992 harvest. Clopyralid was broadcast applied with a CO2 unicycle sprayer with 56 gpa at 30 psi.

Additionally white clover (Trifolium repens) has been planted as a cover crop between the rows in three of the treatments. These plots will be treated with sub-lethal rates of clopyralid for clover suppression once it becomes established.

Treatments were evaluated for growth reduction 4/12/91 and harvested in June. Slight growth reduction was recorded from spring applications in the established planting only. In both trials total harvest weights were significantly reduced with 0.25 lbs ai/A treatments applied in the spring, while no yield reduction was seen from fall applications or low rate spring applications in either trial.

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

CLOPYRALID FOR WEED CONTROL IN 'TOTEM' STRAWBERRIES

EXPT. LOCATION:GERVAIS/MARION, OR
RESEARCH BY:CRABTREE/ESKELSEN   INITIATED:07/09/90   COMPLETED: / /

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	% GRWTH REDUCTN 4/12/91	HARVST1 LBS 6/12/91	HARVST2 LBS 6/19/91	HARVST3 LBS 6/26/91	HARVST4 LBS 7/03/91	TOTYLD LBS 0/00/00
01	STINGER	EC 3.00	0.062	POST1	5	3.0	3.4	6.3	2.3	15.0
02	STINGER	EC 3.00	0.125	POST1	4	2.2	3.3	7.3	2.9	15.7
03	STINGER	EC 3.00	0.250	POST1	5	3.0	3.4	5.2	2.8	14.4
04	STINGER	EC 3.00	0.062	POST2	3	2.8	3.2	7.0	2.6	15.5
05	STINGER	EC 3.00	0.125	POST2	6	2.5	3.6	6.5	2.6	15.1
06	STINGER	EC 3.00	0.250	POST2	5	2.5	2.7	6.0	2.2	12.9
07	STINGER	EC 3.00	0.016	POST3	4	NA	NA	NA	NA	NA
08	STINGER	EC 3.00	0.031	POST3	4	NA	NA	NA	NA	NA
09	STINGER	EC 3.00	0.062	POST3	11	NA	NA	NA	NA	NA
10	HNDWDCHK				6	2.6	3.1	5.8	2.6	14.0
	LSD(0.05) =				9	1.1	1.0	1.6	.9	2.4
	STANDARD DEVIATION =				6	.8	.7	1.1	.6	1.6
	COEFF. OF VARIABILITY =				117	41.4	29.5	25.6	36.0	16.1

CLOPYRALID FOR WEED CONTROL IN 'TOTEM' STRAWBERRIES

** SET 1 OF 1 ** GEN. APPLIC. TYPE	APPLIC. 1 POST 1 1990	APPLIC. 2 POST 2 1990	APPLIC. 3 POST 1 1991	APPLIC. 4	APPLIC. 5
APPLICATION DATE	07/09/90	03/28/91	09/16/91	/ /	/ /
JULIAN DATE/YEAR	J190/90	J 87/91	J259/91	J /	J /
START HR / END HR	03:00/03:20	04:00/04:36	10:00/10:30	: / :	: / :
APPLIC. METHOD	BROADCA	BROADCA	BROADCA		
AIR/SOIL TEMP (F)	82 / 92	60 / 58	65 / 00	0 / 0	0 / 0
% REL. HUMIDITY	50	65	00	0	0
WIND DIR. / VELOC	NE / 6	SW / 5	SW / 5	/ 0	/ 0
SKY / SOIL COND.	CLEAR/	CLEAR/	LTCLD/	/	/
SOIL/LEAF MOIST.	DRY / DRY	WET / DRY	DRY /	/	/
INCORP. EQUIPMENT					
INCORP. DEPTH(in)	0	0	0	0	0
SPRAYER TYPE	CO2 UNICYCL	CO2 UNICYCL	CO2 UNICYCL		
SPRAYER GPA / PSI	56.7 / 30	56.7 / 30	56.7 / 30	0 / 0	0 / 0
MIX SIZE (Gallon)	0.125	0.125	0.125	0	0
NOZZLE TYPE /NUM.	8006/4	8006/4	8006/4		
RAINFALL/IRRIG.in					
0-24 HR/1-3 DAYS	/	/	/	/	/
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

CLOPYRALID FOR WEED CONTROL IN ESTABLISHED STRAWBERRIES

EXPT. LOCATION:GERVAIS/MARION, OR
RESEARCH BY:CRABTREE/ESKELSEN   INITIATED:07/09/90   COMPLETED:08/01/91

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	% GRWTH REDUCTN 4/12/91	HARVST1 LBS 6/17/91	CORECT1 LBS 0/00/00	HARVST2 LBS 6/24/91	CORRCT2 LBS 0/00/00	TOTHVST LBS 0/00/00	CORRECT LBS 0/00/00				
01	STINGER	EC 3.00	0.062	POST1	3	3.5	3.5	2.2	2.2	5.7	5.7				
02	STINGER	EC 3.00	0.125	POST1	5	2.7	2.7	1.4	1.9	4.1	4.6				
03	STINGER	EC 3.00	0.250	POST1	3	3.8	3.8	2.3	2.3	6.1	6.1				
04	STINGER	EC 3.00	0.062	POST2	10	1.9	3.2	3.0	2.4	4.9	5.6				
05	STINGER	EC 3.00	0.125	POST2	10	2.5	3.1	2.4	3.1	4.9	6.2				
06	STINGER	EC 3.00	0.250	POST2	9	2.2	2.3	1.6	1.8	3.8	4.1				
07	HNDWDCHK				3	3.5	3.9	2.0	2.2	5.5	6.1				
	LSD(0.05) =				10	1.2	.6	1.3	.9	1.8	1.3				
	STANDARD DEVIATION =				7	.8	.4	.9	.6	1.3	.9				
	COEFF. OF VARIABILITY =				173	42.8	26.1	65.1	57.0	39.2	33.1				

CLOPYRALID FOR WEED CONTROL IN ESTABLISHED STRAWBERRIES

** SET 1 OF 1 ** GEN. APPLIC. TYPE	APPLIC. 1 POST1	APPLIC. 2 POST2	APPLIC. 3	APPLIC. 4	APPLIC. 5
APPLICATION DATE	07/09/90	03/27/91	/ /	/ /	/ /
JULIAN DATE/YEAR	J190/90	J 86/91	J /	J /	J /
START HR / END HR	03:50/04:10	04:50/05:10	: / :	: / :	: / :
APPLIC. METHOD	BRDCAST	BRDCAST			
AIR/SOIL TEMP (F)	85 / 86	67 / 53	0 / 0	0 / 0	0 / 0
% REL. HUMIDITY	60	68	0	0	0
WIND DIR. / VELOC	NW / 4	/	/ 0	/ 0	/ 0
SKY / SOIL COND.	CLEAR/SMTH	PCLOU/LCLOD	/	/	/
SOIL/LEAF MOIST.	DRY / DRY	WET / DRY	/	/	/
INCORP. EQUIPMENT					
INCORP. DEPTH(in)	0	0	0	0	0
SPRAYER TYPE	CO2 UNICYCL	CO2 UNICYCL			
SPRAYER GPA / PSI	56.7 / 30	56.7 / 30	0 / 0	0 / 0	0 / 0
MIX SIZE (Gallon)	0.125	0.125	0	0	0
NOZZLE TYPE /NUM.	8006/4	8006/4			
RAINFALL/IRRIG.in					
0-24 HR/1-3 DAYS	/	/	/	/	/
4-7 DAYS/2ND WEEK	/	/	/	/	/
3RD WEEK/4TH WEEK	/	/	/	/	/

Clopyralid (Stinger) for Weed Control in Caneberries

D. Boquist, S. Eskelsen, and G. Crabtree, Department of Horticulture
Arden Sheets, Washington County Extension
Oregon State University

Two trials were established in caneberries to evaluate crop tolerance and weed control efficacy of clopyralid in blackberries ('Waldo') and raspberries ('Chilowack'). Treatments include directed applications of clopyralid as either fall, spring, or split applications. Both trials were initiated in the spring of 1991. The blackberry trial was established in the nonbearing year of an AY planting, treatments will be continued and berries will be harvested in 1992. The raspberry trial was not harvested due to overall poor growth resulting from poor site conditions. After final injury evaluations were recorded in October, the raspberry trial was discontinued (a new site will be established in the spring of 1992).

Additionally, white clover has been planted as a cover crop between the rows in 3 of the treatments of the blackberry trial. These plots will be treated with sublethal rates of clopyralid for suppression of white clover once it becomes established.

Spring evaluations in both the blackberries and raspberries noted 0.25 lbs ai/A clopyralid applied in the spring caused leaf cupping (lower rates also caused a minimum amount of leaf cupping). These symptoms were not seen following fall treatments.

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

CLOPYRALID (STINGER) IN BLACKBERRIES-ALTERNATE YEAR PLANTING

EXPT. LOCATION:FOREST GROVE/WASHINGTON,
RESEARCH BY:CRABTREE/BOQUIST   INITIATED:04/29/91   COMPLETED: / /

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLICATION TYPE	BB NJRY 0-100% 5/16/91	THISTLE CTLO-10 5/16/91
01	STINGER	EC 3.00	0.062	SPRNG	1.5	57.5
	ACT 90	XA	0.25%			
02	STINGER	EC 3.00	0.250	FALL	4.3	65.0
	STINGER	EC 3.00	0.125	SPRNG		
	ACT 90	XA	0.25%			
03	STINGER	EC 3.00	0.50	FALL	1.0	82.5
	STINGER	EC 3.00	0.25	SPRNG		
	ACT 90	XA	0.25%			
04	STINGER	EC 3.00	0.062	FALL	0	0
	ACT 90	XA	0.25%			
05	STINGER	EC 3.00	0.125	FALL	0	0
	ACT 90	XA	0.25%			
06	STINGER	EC 3.00	0.25	FALL	0	0
	ACT 90	XA	0.25%			
07	STINGER	EC 3.00	0.062	FALL	2.8	53.8
	STINGER	EC 3.00	0.062	SPRNG		
	ACT 90	XA	0.25%			
08	STINGER	EC 3.00	0.016	CCSUP	0	0
	ACT 90	XA	0.25%			
09	STINGER	EC 3.00	0.031	CCSUP	0	0
	ACT 90	XA	0.25%			
10	STINGER	EC 3.00	0.062	CCSUP	0	0
	ACT 90	XA	0.25%			
11	CONTROL				0	0
				LSD(0.05) =	1.0	2.6
				STANDARD DEVIATION =	.7	1.8
				COEFF. OF VARIABILITY =	68.1	6.7

CLOPYRALID (STINGER) IN BLACKBERRIES-ALTERNATE YEAR PLANTING

** SET 1 OF 1 ** GEN. APPLIC. TYPE	APPLIC. 1 SPRING 91	APPLIC. 2 FALL 91 -1	APPLIC. 3 FALL 91-2	APPLIC. 4	APPLIC. 5
APPLICATION DATE	04/29/91	09/11/91	11/12/91	/ /	/ /
JULIAN DATE/YEAR	J119/91	J254/91	J316/91	J /	J /
START HR / END HR	01:30/02:05	11:30/12:00	08:00/08:30	: / :	: / :
APPLIC. METHOD	DIRECTD	DIRECTD	DIRECTD		
AIR/SOIL TEMP (F)	65 / 60	70 / 65	55 / 0	0 / 0	0 / 0
% REL. HUMIDITY	57	0	0	0	0
WIND DIR. / VELOC	S / 5	S / 5	/ 0	/ 0	/ 0
SKY / SOIL COND.	SUN /WEEDY	SUN /WEEDY	LTCLD/MUDDY	/	/
SOIL/LEAF MOIST.	WET / DRY	/	WET / WET	/	/
INCORP. EQUIPMENT					
INCORP. DEPTH(in)	0	0	0	0	0
SPRAYER TYPE	CO2 UNICYCL	CO2 UNICYCL	CO2 UNICYLC		
SPRAYER GPA / PSI	30 / 30	30 / 30	30 / 30	0 / 0	0 / 0
MIX SIZE (Gallon)	0.165	0.165	0.165	0	0
NOZZLE TYPE /NUM.	8004/4	8004/4	8004/4		
RAINFALL/IRRIG.in					
0-24 HR/1-3 DAYS	/	/	/	/	/
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

CLOPYRALID FOR WEED CONTROL IN RASBERRIES 1991/92

EXPT. LOCATION: FOREST GROVE/WASHINGTON,
RESEARCH BY: ESKELSEN/CRABTREE   INITIATED: 04/17/91   COMPLETED: 9/1/91

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	RB INJRY (0-100) 5/16/91	RB INJRY (0-100) 10/08/*
01	STINGER	EC 3.00	.062	POST1	2	0
	ACT 90	%A	0.25%	POST1		
02	STINGER	EC 3.00	.125	POST1	2	0
	ACT 90	%A	0.25%	POST1		
03	STINGER	EC 3.00	.250	POST1	5	0
	ACT 90	%A	0.25%	POST1		
04	STINGER	EC 3.00	.062	POST2	0	0
	ACT 90	%A	0.25%	POST2		
05	STINGER	EC 3.00	.125	POST2	0	0
	ACT 90	%A	0.25%	POST2		
06	STINGER	EC 3.00	.250	POST2	0	0
	ACT 90	%A	0.25%	POST2		
07	HANDWEED				0	0
	LSD(0.05) =				2	NA
	STANDARD DEVIATION =				1	NA
	COEFF. OF VARIABILITY =				111	NA

CLOPYRALID FOR WEED CONTROL IN RASBERRIES 1991/92

** SET 1 OF 1 ** GEN. APPLIC. TYPE	APPLIC. 1 POST 1 1991	APPLIC. 2 POST 2 1991	APPLIC. 3	APPLIC. 4	APPLIC. 5
APPLICATION DATE	04/17/91	09/11/91	/ /	/ /	/ /
JULIAN DATE/YEAR	J107/91	J254/91	J /	J /	J /
START HR / END HR	12:10/12:30	12:30/01:00	: / :	: / :	: / :
APPLIC. METHOD	BROADCA	BROADCA			
AIR/SOIL TEMP (F)	57 / 47	70 / 60	0 / 0	0 / 0	0 / 0
% REL. HUMIDITY	56	0	0	0	0
WIND DIR. / VELOC	/ 0	S / 5	/ 0	/ 0	/ 0
SKY / SOIL COND.	CLOUD/GRCOV	SUN /GRCOV	/	/	/
SOIL/LEAF MOIST.	WET / DRY	/ DRY	/	/	/
INCORP. EQUIPMENT					
INCORP. DEPTH(in)	0	0	0	0	0
SPRAYER TYPE	CO2 UNICYCL	CO2 UNICYCL			
SPRAYER GPA / PSI	35 / 30	35 / 30	0 / 0	0 / 0	0 / 0
MIX SIZE (Gallon)	0.077	0.077	0	0	0
NOZZLE TYPE /NUM.	8003/4	8003/4			
RAINFALL/IRRIG.in					
0-24 HR/1-3 DAYS	/	/	/	/	/
4-7 DAYS/2ND WEEK	/	/	/	/	/
3RD WEEK/4TH WEEK	/	/	/	/	/

Clopyralid for Weed Control in Sweet Cherries

D. Boquist and G. Crabtree, Department of
Horticulture
Oregon State University

A residue trial was established to supply treated and untreated samples of fruit from sweet cherry trees treated with clopyralid in response to an IR-4 minor use registration project. Treatments of clopyralid at 0.375 lbs ai/A (1X) and 0.750 lbs ai/A (2X) were applied 6/19/91, 30 days prior to harvest to established 'Jubilee' Cherry trees. Directed treatments were applied at 30 gpa with a CO2 unicycle sprayer.

Cherry trees were evaluated for any phytotoxic reactions 7/2/91, residue samples were collected 7/19/91 and trees were harvested 7/22/91. No visual signs of injury were recorded within any of the treatments. Yields varied dramatically between individual plots and did not give a clear indication of treatment effects. Residue samples are currently being analyzed.

TRT. NO.	PESTICIDE NAME	FORMU.		LBai/A	APPLI-CATION TYPE	CH NJYR 0-10 7/02/91	CHERRY WT. LBS 7/19/91
01	STINGER	EC	3.00	0.375	POST	0	54.2
	ACT-90	%A	1.00	0.25%	POST		
02	STINGER	EC	3.00	0.750	POST	0	39.7
	ACT-90	%A	1.00	0.25%	POST		
03	CONTROL					0	67.0
					LSD(0.05) =	NA	NA
					STANDARD DEVIATION =	NA	NA
					COEFF. OF VARIABILITY =	NA	NA

Control of Weeds and Grape Suckers with Ignite

D. Boquist and R.D. William, Department of Horticulture
Oregon State University

A screening trial was established on 'Pinot Noir' grape vines to evaluate the potential for use of the new 1.00 lb ai/gallon formulation of Ignite (glufosinate) to control suckers as well as emerged weeds. Directed treatments of 0.75 and 1.00 lbs ai/A were applied 5/14/91 to strip rows and basal suckers (emerged 3-4").

Postemergent weed control at both rates was excellent with no visible crop injury. Ignite did not control basal suckers at either rate.

EXPT. LOCATION:ALPINE/LANE,
RESEARCH BY:WILLIAM/BOQUIST

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	% WEED CNTRL 6/04/91	CROP INJRY 6/04/91	SUCKER CNTRL 6/04/91	SUCKER MRG NEC 6/04/91
01	IGNITE	EC 1.00	0.75	POST	94	0	0	2
02	IGNITE	EC 1.00	1.00	POST	98	0	0	2
03	CONTROL				0	0	0	0
				LSD(0.05) =	6	NA	NA	0
				STANDARD DEVIATION =	3	NA	NA	0
				COEFF. OF VARIABILITY =	5	NA	NA	25

Postemergent Weed Control in Filberts with Ignite

D. Boquist and R.D. William, Department of Horticulture
Oregon State University

A screening trial was established in strip rows of 'Ennis' filberts to evaluate postemergent weed control of the 1.00 lb ai/gallon formulation of Ignite (glufosinate). Directed treatments of 0.75 and 1.00 lbs ai/A were applied 4/11/91 to 10' band strips.

Although the higher rate provided slightly better weed control, overall postemergent weed control was only 65%. Shading from the crop canopy as well as cloudy conditions may have hindered Ignite activity. There were no visible indications of bark or foliage injury from either treatment.

EXPT. LOCATION:CORVALLIS/BENTON,
RESEARCH BY:WILLIAM/BOQUIST

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	WD CTRL 0-100% 4/24/91	WD CTRL 0-100% 5/13/91
01	IGNITE	EC 1.00	0.75	POST	49	53
02	IGNITE	EC 1.00	1.00	POST	65	63
03	CONTROL				0	0
			LSD(0.05) =		28	37
			STANDARD DEVIATION =		16	21
			COEFF. OF VARIABILITY =		43	56

** SET 1 OF 1 ** GEN. APPLIC. TYPE	APPLIC. 1 POST
APPLICATION DATE	04/11/91
JULIAN DATE/YEAR	J101/91
START HR / END HR	03:00/03:30
APPLIC. METHOD	BROADCA
AIR/SOIL TEMP (F)	65 / 60
% REL. HUMIDITY	0
WIND DIR. / VELOC	NW / 5
SKY / SOIL COND.	SUN /SMTH
SOIL/LEAF MOIST.	WET / DRY
INCORP. EQUIPMENT	
INCORP. DEPTH(in)	0
SPRAYER TYPE	CO2 UNICYCL
SPRAYER GPA / PSI	50 / 30
MIX SIZE (Gallon)	.206
NOZZLE TYPE /NUM.	8003/4
RAINFALL/IRRIG.in	
0-24 HR/1-3 DAYS	/
4-7 DAYS/2ND WEEK	/
3RD WEEK/4TH WEEK	/

Caneberry Primocane Suppression

D. Boquist, and R. D. William, Department of Horticulture
Arden Sheets, Washington County Extension
Oregon State University

Raspberries

Two trials were established in raspberries to evaluate suppression and regrowth of primocanes at two sites with elevations of 250 and 1500 ft. Both trials included single applications of Goal (oxyfluorfen) at 1, 2, 4, and 6 pints/A, applied mid-April. Additional treatments were evaluated at the lower elevation site and they included; Ignite at 0.5 and 0.75 lbs ai/A, NAA-800 (naphthaleneacetic acid) at 0.5% and 1.0%, and three treatments (3/28, 4/17, and 4/29) using a propane torch. All treatments were evaluated for primocane suppression and control of fruiting spurs. Goal treatments at both sites were monitored throughout the season for primocane regrowth (graphs 1-3).

The potential for greater activity at cooler sites with lower rates of Goal is demonstrated by comparison of the rate response curve at Forest Grove (5/30) with similar responses for 2 to 6 pints at Sandy (5/21). This is largely a result of warmer temperatures at the lower elevation. Overall, primocane suppression and subsequent regrowth was best achieved with 2-4 pints/A of Goal at both sites, although 2 to 3 pints may be preferable under most conditions.

Other treatments achieved only marginal control due probably to insufficient coverage with NAA-800, cool weather conditions after treatment affecting Ignite metabolism, and oversized primocanes for adequate propane treatments. Propane observations merit redesign of the nozzle assembly.

Blackberries

Primocane suppression treatments were applied April 29, and May 30, to 'Waldo' evergreen blackberries. Treatments included Ignite at 0.5 and 0.75 lbs ai/A, Goal at 0.6 lbs ai/A (totaling 6 pints/A/year), and NAA-800 at 0.1, 0.25, and 0.50 %. Late spring rains and flooded fields impeded primocane early applications and Post 1 treatments were applied to slightly oversized (over 6") primocanes, whereas prior to Post 2 applications all primocanes over 6" were pruned to ground level. Only marginal control was achieved with any of the treatments. Early control (75%) was achieved with Goal which typically performs best in cool weather, while later season control was achieved with Ignite which performs well when conditions favor active photosynthesis. Treatments in 1992 will evaluate combinations of Goal and Ignite applications.

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

PRIMOCANE SUPPRESSION IN BLACKBERRIES - BEARING 1991

EXPT. LOCATION:FOREST GROVE/WASHINGTON,
RESEARCH BY:BOQUIST/WILLIAM   INITIATED:04/29/91   COMPLETED: / /

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	PRIMO SUPPRSN 5/16/91	CNTRL FR SPUR 5/16/91	PRIMOCA CTLO-10 7/30/91	HARVEST WT (LB) 8/06/91	HARVEST WT LBS 8/13/91	HARVEST WT LBS 8/22/91	TOTAL HARVEST 0/00/00				
01	IGNITE	EC 1.00	0.5	POST	50	63	4	6.2	4.5	4.2	10.7				
02	IGNITE	EC 1.00	0.75	POST	57	85	7	7.2	4.7	3.9	11.9				
03	GOAL	EC 1.6	0.6	POST	75	89	5	7.9	3.3	3.4	9.2				
04	NAA 800	%A 20.1	0.1%	POST	28	23	5	NA	NA	NA	0				
05	NAA 800	%A 20.1	0.25%	POST	47	27	3	NA	NA	NA	0				
06	NAA 800	%A 20.1	0.50%	POST	43	43	4	NA	NA	NA	0				
07	CONTROL				8	8	3	7.5	4.2	3.6	9.9				
	LSD(0.05) =				28	30	2	2.6	1.2	1.6	5.1				
	STANDARD DEVIATION =				19	20	2	1.8	.8	1.1	3.5				
	COEFF. OF VARIABILITY =				46	43	36	49.6	33.4	50.1	58.2				

** SET 1 OF 1 ** GEN. APPLIC. TYPE	APPLIC. 1 POST 1	APPLIC. 2 POST 2	APPLIC. 3	APPLIC. 4	APPLIC. 5
APPLICATION DATE	04/29/91	05/30/91	/ /	/ /	/ /
JULIAN DATE/YEAR	J119/91	J150/91	J /	J /	J /
START HR / END HR	02:10/02:30	12:30/01:30	: / :	: / :	: / :
APPLIC. METHOD	DIRECTD	DIRECTD			
AIR/SOIL TEMP (F)	66 / 60	60 / 50	0 / 0	0 / 0	0 / 0
% REL. HUMIDITY	57	0	0	0	0
WIND DIR. / VELOC	S / 5	S / 5	/ 0	/ 0	/ 0
SKY / SOIL COND.	SUN /SMTH	CLOUD/SMTH	/	/	/
SOIL/LEAF MOIST.	WET / DRY	WET / DRY	/	/	/
INCORP. EQUIPMENT					
INCORP. DEPTH(in)	0	0	0	0	0
SPRAYER TYPE	C02 UNICYCL	CO2 UNICYCL			
SPRAYER GPA / PSI	30 / 30	30 / 30	0 / 0	0 / 0	0 / 0
MIX SIZE (Gallon)	.031	.031	0	0	0
NOZZLE TYPE /NUM.	1/OC-02	1/OC-02			
RAINFALL/IRRIG.in					
0-24 HR/1-3 DAYS	/	/	/	/	/
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

PRIMOCANE SUPPRESSION IN RASPBERRIES - SANDY FARMS 1991

EXPT. LOCATION: SANDY/MULTNOMAH,
RESEARCH BY: BOQUIST/WILLIAM   INITIATED: 04/12/91   COMPLETED: / /

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	% PRIMO SUPRSIN 5/21/91	FRT SPR % CNTRL 5/21/91	# PRIMO /PLANT 5/21/91	PRIMO HT. IN 5/21/91	PRIMO HT. IN 6/19/91	# PRIMO /PLANT 7/02/91	PRIMO HT. IN 7/02/91	# PRIMO /PLANT 7/31/91	PRIMO HT. IN 7/31/91
01	GOAL	EC 1.6	0.2	POST	76	96	9.3	13.6	23.4	16.2	37.7	15.1	47.4
	ACT-90	%A 1.0	0.50%	POST									
02	GOAL	EC 1.6	0.4	POST	83	95	6.3	7.1	24.2	16.6	33.3	17.5	44.0
	ACT-90	%A 1.0	0.50%	POST									
03	GOAL	EC 1.6	0.8	POST	90	96	3.7	7.3	15.4	17.5	31.6	16.8	46.9
	ACT-90	%A 1.0	0.50%	POST									
04	GOAL	EC 1.6	1.2	POST	89	94	4.1	7.6	18.4	17.6	33.2	15.3	42.8
	ACT-90	%A 1.0	0.50%	POST									
05	CONTROL				0	0	11.5	25.8	33.4	14.2	45.8	13.2	58.6
	LSD(0.05) =				7	7	3.0	3.1	7.7	4.5	NA	4.8	10.0
	STANDARD DEVIATION =				4	5	2.0	2.0	5.0	2.9	NA	3.1	6.5
	COEFF. OF VARIABILITY =				6	6	28.1	16.6	21.9	18.7	NA	21.3	14.2

EXPT. LOCATION: SANDY/MULTNOMAH,
RESEARCH BY: BOQUIST/WILLIAM   INITIATED: 04/12/91   COMPLETED: / /

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	# PRIMO /PLANT 8/15/91	PRIMO HT. IN 8/15/91	# PRIMO /PLANT 9/09/91	PRIMO HT. IN 9/09/91	# PRIMO /PLANT 1/13/92	PRIMO HT. IN 1/13/92	VIGOR 0 - 10 1/13/92
01	GOAL	EC 1.6	0.2	POST	13.6	66.1	14.7	75.6	9.1	81.8	7.0
	ACT-90	%A 1.0	0.50%	POST							
02	GOAL	EC 1.6	0.4	POST	17.0	55.8	17.0	65.0	9.0	77.0	5.8
	ACT-90	%A 1.0	0.50%	POST							
03	GOAL	EC 1.6	0.8	POST	16.5	52.2	17.0	64.3	9.1	78.5	5.8
	ACT-90	%A 1.0	0.50%	POST							
04	GOAL	EC 1.6	1.2	POST	15.7	54.9	16.1	65.9	8.6	79.8	6.8
	ACT-90	%A 1.0	0.50%	POST							
05	CONTROL				10.0	71.3	13.5	81.9	10.5	84.0	8.0
	LSD(0.05) =				NA	5.2	3.4	8.9	3.9	NA	2.5
	STANDARD DEVIATION =				NA	3.4	2.2	5.8	2.6	NA	1.6
	COEFF. OF VARIABILITY =				NA	5.9	14.8	8.6	29.2	NA	24.1

PRIMOCANE SUPPRESSION IN RASPBERRIES - FOREST GROVE 1991

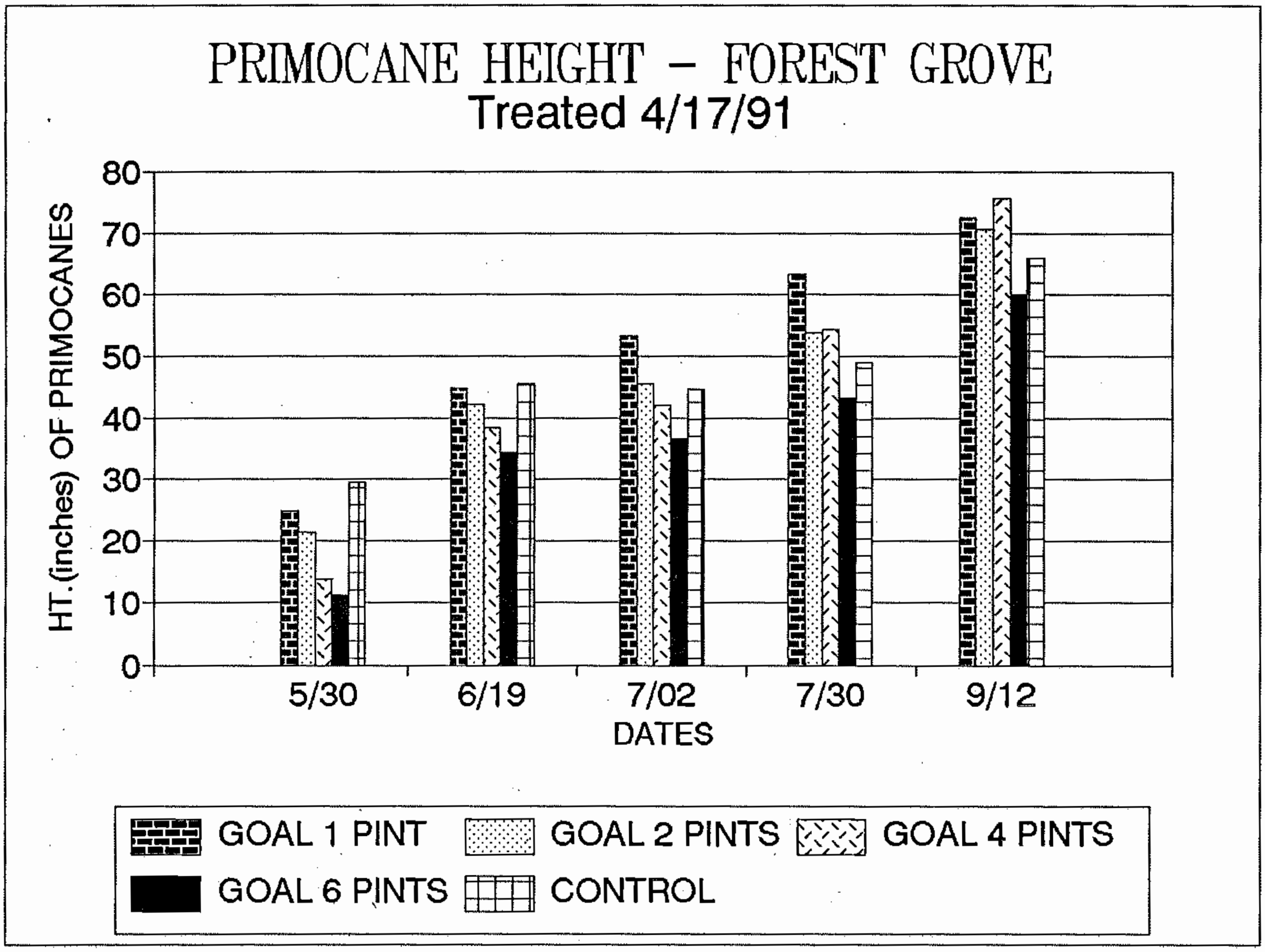
EXPT. LOCATION:FOREST GROVE,
RESEARCH BY:BOQUIST/WILLIAM   INITIATED:04/17/91

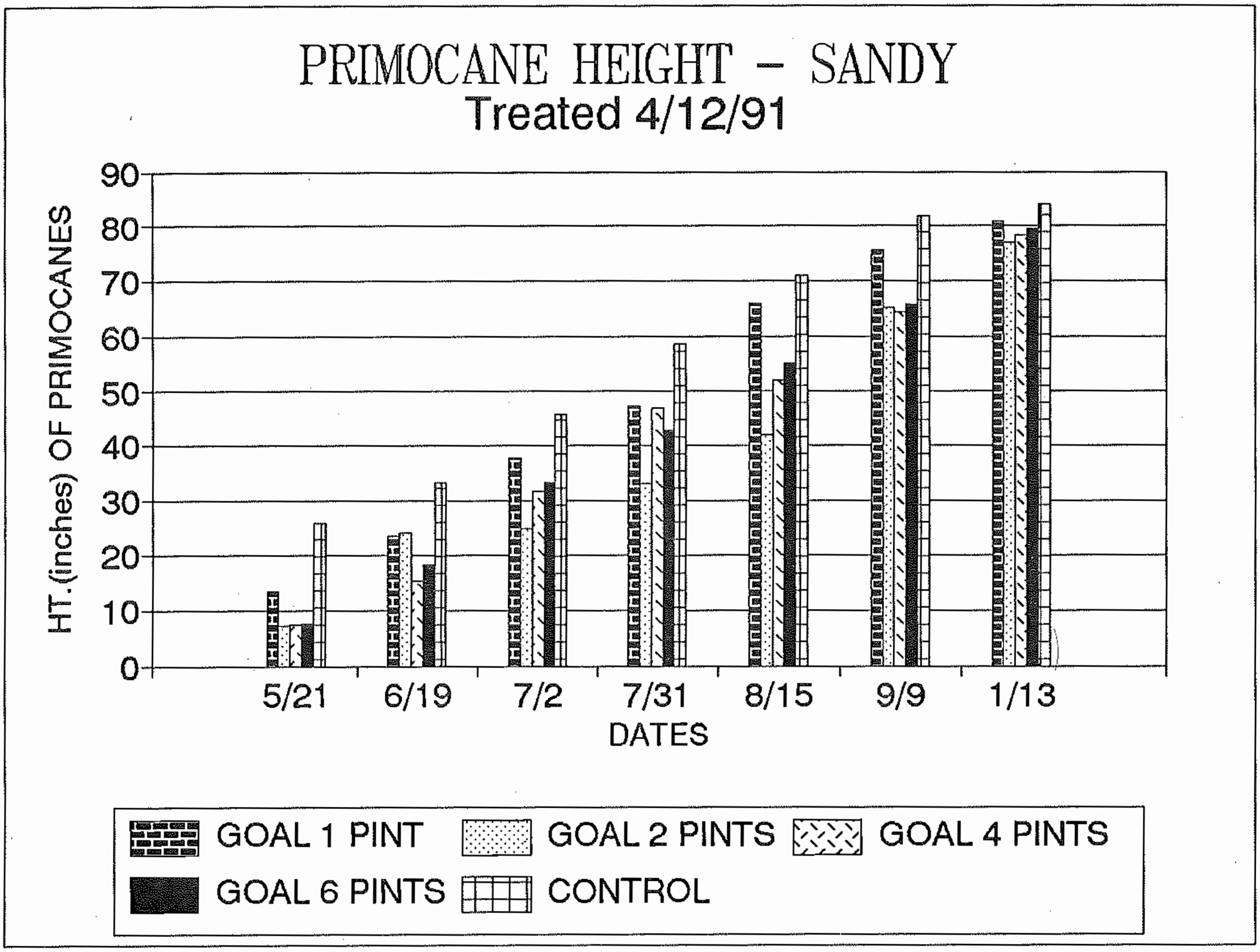
TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	PRIMO SUPPRSN 5/16/91	CONTROL FRSPURS 5/16/91	PRIMO %RGRWTH 5/16/91	% HT REGRWTH 5/16/91	PRIMOCA VIGOR 7/30/91
01	GOAL	EC 1.6	0.2	POST	53	63	75	43	8
	ACT-90	%A	0.25%	POST					
02	GOAL	EC 1.6	0.4	POST	68	78	60	40	8
	ACT-90	%A	0.25%	POST					
03	GOAL	EC 1.6	0.8	POST	68	83	38	35	7
	ACT-90	%A	0.25%	POST					
04	GOAL	EC 1.6	1.2	POST	80	85	30	28	6
	ACT-90	%A	0.25%	POST					
05	NAA-800	%A 20.1	0.5%	POST	30	18	NA	NA	5
06	NAA-800	%A 20.1	1.0%	POST	25	33	NA	NA	8
07	IGNITE	EC 1.0	0.5	POST	40	38	NA	NA	7
08	PROPANE			POST	48	83	NA	NA	7
09	IGNITE	EC 1.0	0.75	POST	53	76	NA	NA	7
10	CONTROL				0	0	NA	NA	4
				LSD(0.05) =	23	17	18	12	3
				STANDARD DEVIATION =	16	12	12	8	2
				COEFF. OF VARIABILITY =	34	22	60	58	33

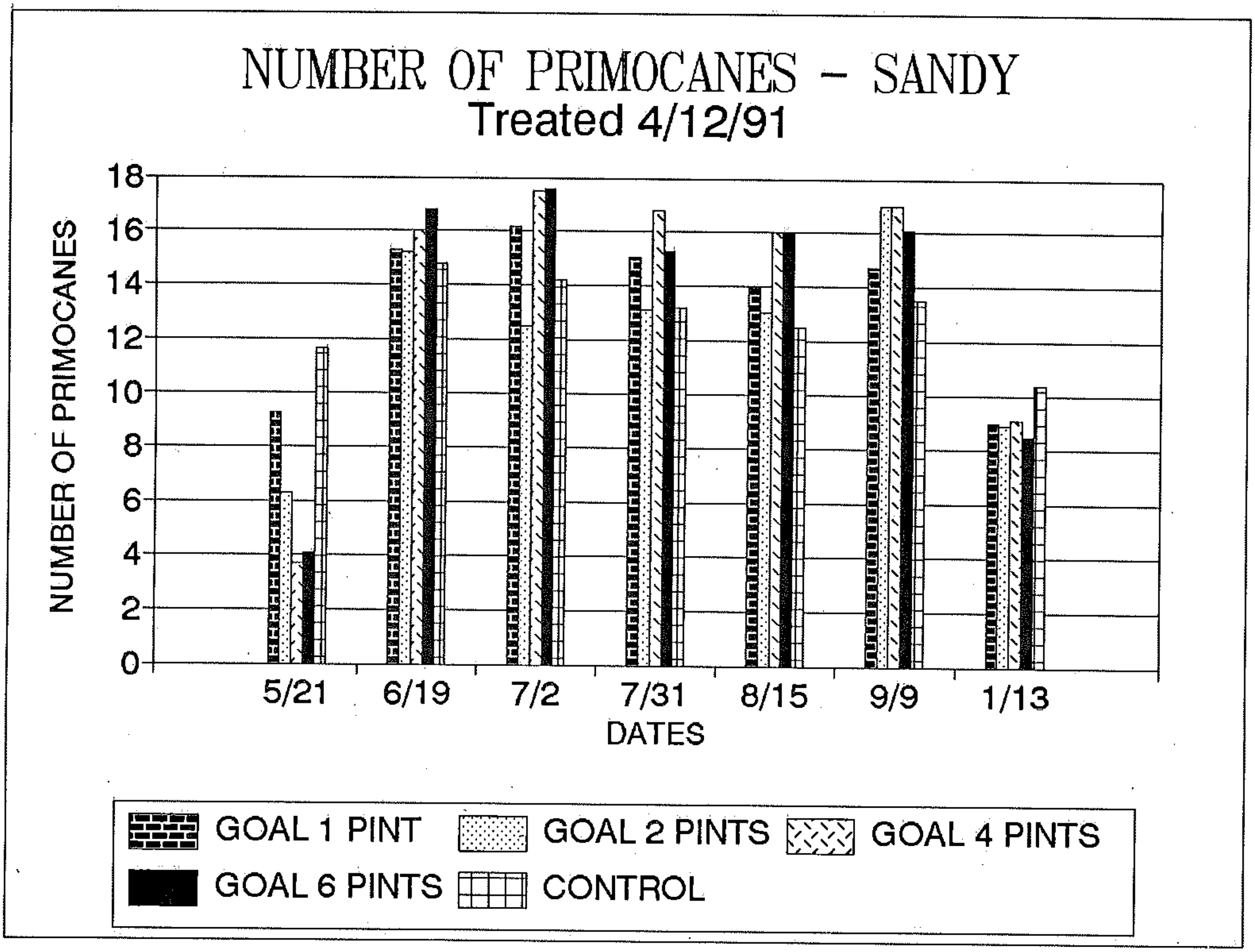
PRIMOCANE SUPPRESSION IN RASPBERRIES - FOREST GROVE 1991

EXPT. LOCATION: FOREST GROVE,
RESEARCH BY: BOQUIST/WILLIAM INITIATED: 04/17/91

TRT. NO.	PESTICIDE NAME	FORMU.	LBai/A	APPLI-CATION TYPE	# PRIMO PER FT 5/30/91	AVE HT" PRIMOCA 5/30/91	# PRIMO PER FT 6/19/91	AVE HT" PRIMOCA 6/19/91	AVE HT" PRIMOCA 7/02/91	AVE HT" PRIMOCA 7/30/91	AVE HT" PRIMOCA 9/12/91
01	GOAL	EC 1.6	0.2	POST	13.4	24.8	13.0	44.8	53.2	63.3	72.5
	ACT-90	%A	0.25%	POST							
02	GOAL	EC 1.6	0.4	POST	12.4	21.5	12.5	42.3	45.3	53.7	70.5
	ACT-90	%A	0.25%	POST							
03	GOAL	EC 1.6	0.8	POST	12.7	13.9	11.2	38.3	42.0	54.4	75.5
	ACT-90	%A	0.25%	POST							
04	GOAL	EC 1.6	1.2	POST	12.9	11.4	10.5	34.4	36.6	43.4	60.0
	ACT-90	%A	0.25%	POST							
05	NAA-800	%A 20.1	0.5%	POST	NA	NA	NA	NA	NA	NA	NA
06	NAA-800	%A 20.1	1.0%	POST	NA	NA	NA	NA	NA	NA	NA
07	IGNITE	EC 1.0	0.5	POST	NA	NA	NA	NA	NA	NA	NA
08	PROPANE			POST	NA	NA	NA	NA	NA	NA	NA
09	IGNITE	EC 1.0	0.75	POST	NA	NA	NA	NA	NA	NA	NA
10	CONTROL				13.5	29.6	15.0	45.3	44.5	48.9	66.0
			LSD(0.05) =		3.1	5.1	2.8	4.8	8.0	11.9	12.8
			STANDARD DEVIATION =		2.1	3.5	1.9	3.3	5.5	8.2	8.8
			COEFF. OF VARIABILITY =		32.5	34.6	31.3	16.2	24.8	31.1	25.6


PRIMOCANE HEIGHT - FOREST GROVE
Treated 4/17/91
HT.(inches) OF PRIMOCANES
0
10
20
30
40
50
60
70
80
5/30
6/19
7/02
7/30
9/12
DATES
GOAL 1 PINT
GOAL 2 PINTS
GOAL 4 PINTS
GOAL 6 PINTS
CONTROL


PRIMOCANE HEIGHT - SANDY
Treated 4/12/91
HT.(inches) OF PRIMOCANES
0
10
20
30
40
50
60
70
80
90
5/21
6/19
7/2
7/31
8/15
9/9
1/13
DATES
GOAL 1 PINT
GOAL 2 PINTS
GOAL 4 PINTS
GOAL 6 PINTS
CONTROL


NUMBER OF PRIMOCANES - SANDY
Treated 4/12/91
NUMBER OF PRIMOCANES
0
2
4
6
8
10
12
14
16
18
5/21
6/19
7/2
7/31
8/15
9/9
1/13
DATES
GOAL 1 PINT
GOAL 2 PINTS
GOAL 4 PINTS
GOAL 6 PINTS
CONTROL

COVER CROPS FOR WEED SUPPRESSION AND BIOMASS PRODUCTION IN RED RASPBERRIES

Diane Kaufman, Russ Karow, Arden Sheets, and Ray William, OSU Extension. Recent interest in farming with reduced chemical inputs has revived interest in the potential of cover crops for weed suppression and green manure. This research was conducted in a red raspberry field near Sandy, Oregon for the purpose of comparing six cover crop species for adaptability, winter survival, biomass production, and weed suppression, both by the cover between berry rows and by a mulch of the cover placed within the berry row.

Aisles on each side of a berry row were seeded with one of six cover crops in unreplicated demonstration plots. Cover crops evaluated were: 'Galt' spring barley; 'Amity' winter oat; 'Cayuse' spring oat; 'Flora' triticale; Austrian winter pea; crimson clover, and native weed cover for the control. Topography, soil conditions, and predominant weed species were uniform throughout the test area. Plot size was 6,000 ft^2 (600 linear ft X 5 ft wide X 2 sides of the berry row). The covers were seeded on September 25, 1990, with the exception of the 'Galt' barley, which was not seeded until October 11, 1990. Plots were rototilled shallowly after broadcast surface seeding with a Gandy spreader. Seeding rates are shown in Table 1.

Table 1. Seeding rate for 1990-91 Cover Crop Study in red raspberries. Sandy, OR.

	Weight of 1000 Seed	Seeding Rate/ft^2	Seed Needed to cover 6000 ft^2	Seeding Rate/Acre
'Galt' Barley	40g	45 seeds	24 lbs	170 lbs
'Amity' Winter Oat	~30g	45 seeds	18 lbs	130 lbs
'Cayuse' Spring Oat	~30g	45 seeds	18 lbs	130 lbs
'Flora' Triticale	42g	45 seeds	25 lbs	180 lbs
Austrian Pea	116g	15 seeds	23 lbs	170 lbs
Crimson Clover	6.1g	100 seeds	8 lbs	55 lbs

Both 'Cayuse' spring oat and 'Galt' barley suffered severe winter injury. Crimson clover failed to establish.

Weeds were counted in the 'Amity' winter oat, 'Flora' triticale, Austrian winter pea and the control plots on May 10, 1991, (Table 2) by counting 20 random samples (11 inch diameter) in each 6,000 ft^2 plot. Ladysthumb smartweed was the predominant weed throughout the test area and in the native weed cover control. Each of the covers reduced Ladysthumb smartweed populations.

Table 2. Number of weeds in the cover crop test in red raspberries near Sandy, Oregon, May 10, 1991.

	Weed number*			
Predominant weed species	'Amity' oat	'Flora' triticale	Austrian pea	Native weed cover
Common chickweed	25	3	0	3
Mouse ear chickweed	3	4	1	19
Little bittercress	10	14	16	1
Annual bluegrass	2	5	0	7
Cornspurry	0	2	0	16
Common groundsel	0	1	0	0
Wild radish	1	2	1	1
Ladysthumb smartweed	0	15	0	557

*=Combined counts from 20 samples of a circular area 11 inches in diameter.

Cover crops were harvested on May 10, 1991 from five randomly selected sub plots within the plot area. Plant material was green and succulent. Samples were weighed, oven dried, weighed again, then analyzed for total % N and P. Total weight of green and dry matter, N and P/acre were then calculated (Table 3).

Table 3. Total Biomass Production and N and P content in cover crop test in red raspberries. Sandy, OR. May 1991.

Cover Crop	Green Weight Tons/A	Dry Weight Tons/A	Total N %	Total N lb/A	Total P %	Total P lb/A
Austrian Pea	15.3	1.9	4.40	168	.34	13
'Amity' Oat	10.8	2.2	2.17	98	.17	7.7
'Flora' Triticale	6.3	1.6	2.28	74	.17	5.5

Austrian winter peas produced the most green matter, nitrogen and phosphorous. However, Amity oat had the most dry matter. Depending on how rapidly mineralization occurs, these cover crops may produce a substantial part of the N requirements for red raspberries.

The covers were mowed on May 14, 1991, and clippings moved to four randomly selected plots (30 ft. long) to which no preemergence herbicides had been applied. Each 30 ft. plot (panel) was divided into four 7.5 ft. sub plots over which a 3-4 in. thick mulch of Austrian winter pea, 'Amity' winter oat, or a shredded poplar excelsior was placed, in addition to a non-mulched control. Each of the mulches, at a thickness of 3 in., suppressed weeds. However, where the mulch was less than 2 in. thick, weeds were able to germinate and become established.

After mowing, each row was divided into alternating 2-panel treatments in which covers were either rototilled or left on the surface until the end of harvest. Though mowing destroyed the Austrian winter pea, the 'Amity' oat and 'Flora' triticale survived. They remained alive, though not vigorous, until raspberry harvest, when they were killed as a result of mechanical harvester traffic. The mowed covers continued to suppress weeds throughout the summer and no negative effects on raspberry plant growth were observed.

This research is currently being expanded to include additional cover crop species. Cover crops selected from these trials will be evaluated in the future in a replicated trial.