

## **Weed control in small fruits.**

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Several projects were conducted in small fruits during 1998: four studies for caneburning and weed control in red raspberries, and three herbicide studies in strawberries.

### **Red raspberry studies.**

1. Advanced testing (caneburning) study. Plots were established near Lynden, WA (Curt Maberry, cooperator). Goal, Liberty, and Aim herbicides (each mixed with 0.25% (v/v) Sylgaard) were applied April 22, 1998 to 'Meeker' raspberries when primocanes were 4 to 8 inches in height. Primocane control and weed control were evaluated May 18 and June 11, 1998, respectively. Four random floricanes were removed and number and length of flower laterals were recorded July 7, 1998. Four weekly partial harvests of randomly selected berries were conducted during the commercial harvest season, and the weight of 50 berries recorded.

2. New product (caneburning) study. Plots were established near Lynden, WA (John Clark, cooperator). One rate of Buctril, Spin-Aid, and Betamix, and two rates of Milestone (plus Gramoxone at 2.4 pt/a plus X77 at 0.25%, v/v) were applied April 22, 1998 to 'Meeker' raspberries when primocanes were 4 to 8 inches in height. Primocane control and weed control were evaluated May 18 and June 11, 1998, respectively. One meter sections of each plot were harvested July 2, 1998, and the weight of 50 berries recorded.

3. Scythe/Goal (caneburning) study. Plots were established near Lynden, WA (John Clark, cooperator). Scythe at two rates with or without Sylgaard (at 0.25%, v/v), Scythe at two rates mixed with Goal, and Goal alone were applied April 22, 1998 to 'Meeker' raspberries when primocanes were 4 to 8 inches in height. Primocane control and weed control were evaluated May 18 and June 11, 1998, respectively. One meter sections of each plot were harvested July 2, 1998, and the weight of 50 berries recorded.

4. Visor/Goal (caneburning) study. Plots were established near Burlington, WA (Mike Youngquist, cooperator). Visor (with Latron at 0.125%, v/v), Goal at two rates, and Visor at two rates mixed with Goal were applied April 16, 1998 to 'Meeker' raspberries when primocanes were 4 to 8 inches in height. Primocane control was evaluated April 28, 1998, and late season weed control September 29, 1998. One meter sections of each plot were harvested July 6, 1998, and the weight of 50 berries recorded.

Table 1. Effects of three herbicides for primocane removal and weed control on established raspberries (advanced testing, 1998).

Treatment <sup>1</sup>	Rate	Cane burning	Weed Control <sup>2</sup>	Primocane number	Florican number
	(product/a)	(%)	(1 to 3)	(canes/15 ft)	(canes/15 ft)
Goal	0.8 pt	86	2.8	107	60
Goal	1.6 pt	92	3.0	81	57
Liberty	4 pt	92	2.3	111	87
Liberty	8 pt	93	2.8	86	60
Aim	0.8 oz	83	2.3	144	76
Aim	1.6 oz	81	2.5	164	71
Aim	3.2 oz	86	2.8	127	85
Untreated	---		1.0	154	67
LSD <sub>0.05</sub>	---	---	0.8	45	ns

<sup>1</sup>All treatments mixed with Sylgaard at 0.25% v/v.

<sup>2</sup>Evaluations made 26 days after treatment: 1 = no weed control, 3 = complete weed control.

Table 2. Effects of three herbicides on reproductive lateral formation and cane productivity of established raspberries (advanced testing, 1998).

Treatment <sup>1</sup>	Rate	Berries/ per lateral	Lateral length	Laterals/ per cane	Berries/ per cane	Lateral length per cane
	(product/a)		(in.)			(in.)
Goal	0.8 pt	13.6	57.7	13.2	179.5	762.5
Goal	1.6 pt	11.1	48.3	13.9	154.3	638.1
Liberty	4 pt	9.8	42.8	15.0	147.0	639.6
Liberty	8 pt	10.8	46.6	13.3	143.6	619.6
Aim	0.8 oz	10.9	49.5	14.7	160.2	727.7
Aim	1.6 oz	10.4	44.6	17.4	181.0	762.4
Aim	3.2 oz	9.9	43.4	15.6	154.4	677.9
Untreated	---	11.7	51.0	16.0	187.2	817.7
LSD <sub>0.05</sub>	---					

<sup>1</sup>All treatments mixed with Sylgaard at 0.25% v/v.

Table 3. Effects of several new herbicides for primocane removal and weed control on established raspberries (1998).

Treatment <sup>1</sup>	Rate	Cane burning	Weed Control <sup>2</sup>	Berry weight	50-berry weight
	(product/a)		(1 to 3)	(lb/a)	(g)
Buctril	1.5 pt	poor	1.0	1006	117
Spin-aid	6.2 pt	poor	1.0	1044	118
Betamix	6.2 pt	poor	1.0	1161	109
Milestone + Gramoxone	5 oz + 2.4 pt	excellent	2.3	1237	127
Milestone + Gramoxone	10 oz + 2.4 pt	excellent	2.7	1380	116
Untreated	---	none	0	828	90
LSD <sub>0.05</sub>	---	---		ns	ns

<sup>1</sup>Milestone + Gramoxone treatments mixed with X-77 at 0.25% v/v.

<sup>2</sup>Evaluations made 50 days after treatment: 1 = no weed control, 3 = complete weed control.

Table 4. Effects of Scythe and Goal applied alone or in combination for primocane removal and weed control on established raspberries (1998).

Treatment	Rate	Cane burning	Weed Control <sup>1</sup>	Berry weight	50-berry weight
	(product/a)	(%)	(1 to 3)	(lb/a)	(g)
Scythe	2%	poor	1.0	889	113
Scythe + Sylgaard	2% + 0.05%	poor	1.7	1059	111
Scythe	2.5%	poor	1.7	1377	112
Scythe + Sylgaard	2.5% + 0.05%	poor	2.0	1527	99
Scythe + Goal	1% + 0.3 pt	excellent	1.7	1167	127
Scythe + Goal	1.5% + 0.3 pt	excellent	2.3	1012	117
Goal	0.3 pt	excellent	1.7	1260	112
Untreated	---	none	0	828	90
LSD <sub>0.05</sub>	---	---		421	15

<sup>1</sup>Evaluations made 50 days after treatment: 1 = no weed control, 3 = complete weed control.

Table 5. Effects of Visor and Goal applied alone or in combination for primocane removal and weed control on established raspberries (1998).

Treatment <sup>1</sup>	Rate	Cane burning	Weed Control <sup>2</sup>	Berry weight	50-berry weight
	(product/a)		(%)	(lb/a)	(g)
Visor	3 pt	poor	78	2527	146
Goal	0.8 pt	excellent	68	2609	162
Goal	1.6 pt	excellent	73	2650	165
Visor + Goal	2 pt + 0.8 pt	excellent	78	2632	155
Visor + Goal	3 pt + 0.8 pt	excellent	88	2550	150
Untreated	---	none	0	2035	148
LSD <sub>0.05</sub>	---	---	17	ns	ns

<sup>1</sup>All treatments mixed with Latron 98 at 0.125% v/v.

<sup>2</sup>Evaluations made 19 weeks after treatment: 1 = no weed control, 3 = complete weed control.

### Strawberry studies.

1. Pre-transplant incorporated/pre-transplant herbicides (new planting) study. Plots were established at WSU-Mount Vernon. Pre-transplant incorporated (PTI) and pre-transplant (PTR) herbicides were applied May 11, 1998, after which strawberries (cv. 'Totem' and 'Redcrest') were transplanted. Crop injury and early season weed control was visually estimated June 12, 1998; late season weed control was estimated September 6, 1998. Six plants of each variety per treatment were harvested August , 1998, and the number of leaves, leaf area, and number of runners and daughter plants recorded.

2. Post-transplant (new planting) study. Plots were established at WSU-Mount Vernon. Strawberries (cv. 'Totem' and 'Redcrest') were transplanted May 11, 1998, after which post-transplant herbicides were applied. Crop injury and early season weed control was visually estimated June 12, 1998; late season weed control was estimated September 6, 1998. Six plants of each variety per treatment were harvested August , 1998, and the number of leaves, leaf area, and number of runners and daughter plants recorded.

3. Postemergence sulfonyleurea/imidazolinone study. Strawberries (cv. 'Totem' and 'Redcrest') were transplanted into pots May 28, 1998. Pots were maintained in the greenhouse at WSU-Mount Vernon (daily highs approximately 70 F, daily lows approximately 50 F, no supplemental light). Plants were treated June 18, 1998 with one of 13 sulfonyleurea or imidazolinone herbicides (mixed with R-11 at 0.25%, v/v) or R-11 alone; plants were then returned to the greenhouse. Strawberry plants were harvested August 12, 1998, and the number and fresh weight of leaves recorded. Leaves were then dried for 72 hours at 120 F and leaf dry weight recorded.

Table 6. Effect of pre-transplant incorporated and pre-transplant herbicides on newly planted strawberry (1998).

Treatment	Rate (product/a)	Weed Control		Crop			Daughter	
		6/12	9/6	Injury 6/12	Leaf Area	Leaves	Runners	plants
		----(%)----		(%)	(cm <sup>2</sup> /plant)	------(no./plant)-----		
Devrinol + Goal	4 lb + 1.5 pt	100	74	10	432	7.5	1.1	0.8
Devrinol + Blazer	4 lb + 2 pt	98	43	4	543	8.3	1.5	1.5
Devrinol + Cobra	4 lb + 2 pt	100	74	11	507	8.2	1.6	0.9
Devrinol + Visor	4 lb + 1.5 pt	100	64	8	585	9.2	1.8	1.2
Devrinol + Dual Magnum	4 lb + 0.5 pt	98	24	7	447	7.6	1.1	1.0
Prowl + Goal	2.4 pt + 1.5 pt	100	68	13	654	9.0	2.2	1.5
Prowl + Blazer	2.4 pt + 2 pt	99	64	3	840	9.2	3.3	3.1
Prowl + Cobra	2.4 pt + 2 pt	100	81	7	771	9.7	3.5	3.3
Prowl + Visor	2.4 pt + 1.5 pt	98	64	7	692	9.2	2.7	2.2
Prowl + Dual Magnum	2.4 pt + 0.5 pt	91	10	3	406	6.9	0.7	0.7
Visor	1.5 pt	96	35	5	493	7.3	1.4	1.4
Visor	2 pt	98	53	8	624	8.7	2.3	1.7
Goal	2 pt	94	26	15	408	6.2	0.8	0.4
Goal + Visor	2 pt + 1.5 pt	99	83	16	583	8.3	2.0	1.6
Goal + Visor	1 pt + 2 pt	100	84	13	525	8.0	1.8	1.3
Goal + Visor	2 pt + 1 pt	100	88	12	509	8.3	1.2	0.8
handweeded	---	0	100	0	1069	10.2	4.4	4.3
untreated	---	0	0	0	363	5.8	0.5	0.4
LSD <sub>0.05</sub>	---	3	22	4	124			

Table 7. Effect of post-transplant herbicides on newly planted strawberry (1998).

Treatment	Rate (product/a)	Weed Control		Crop			Daughter	
		6/12	9/6	Injury 6/12	Leaf Area	Leaves	Runners	plants
		----(%)----		(%)	(cm <sup>2</sup> /plant)	------(no./plant)-----		
Goal	1 pt	90	10	8	387	6.5	0.5	0.1
Goal	2 pt	95	33	12	373	6.7	0.8	0.4
Visor	1 pt	94	15	3	614	9.7	1.5	1.2
Visor	2 pt	99	78	4	708	9.5	2.7	2.3
Prowl	2.4 pt	71	16	4	638	8.1	1.6	1.0
Prowl	3.6 pt	73	15	3	641	8.9	1.8	1.2
Devrinol	4 lb	41	0	1	447	7.0	0.4	0.2
Devrinol	6 lb	64	0	1	439	6.4	0.6	0.6
handweeded	---	100	100	0	726	9.0	2.4	1.9
LSD <sub>0.05</sub>	---	---	14	2	128			

Table 8. Effect of sulfonylurea and imidazolinone herbicides applied postemergence on strawberry (1998).

Treatment	Active ingredient(s)	Rate	Number of leaves (per plant)	Leaf weight	
				fresh	dry
				----- (g) -----	
Basis	rimisulfuron + thifensulfuron	0.3 oz	0.3	0.02	0.014
Basis	rimisulfuron + thifensulfuron	0.6 oz	0.1	0.01	0.008
Accent	nicosulfuron	0.33 oz	1.7	0.49	0.202
Accent	nicosulfuron	0.67 oz	1.8	0.50	0.185
Matrix	rimisulfuron	0.75 oz	3.6	1.05	0.362
Matrix	rimisulfuron	1.5 oz	2.6	0.39	0.151
Pursuit	imazethapyr	0.75 pt	0.0	0.00	0.000
Pursuit	imazethapyr	1.5 pt	0.0	0.00	0.000
Peak	prosulfuron	0.15 oz	0.0	0.00	0.000
Peak	prosulfuron	0.3 oz	0.0	0.00	0.000
Harmony Extra	tribenuron + thifensulfuron	0.3 oz	0.0	0.00	0.000
Harmony Extra	tribenuron + thifensulfuron	0.6 oz	0.0	0.00	0.000
Permit	halosulfuron	0.67 oz	1.7	0.20	0.063
Permit	halosulfuron	1.3 oz	0.2	0.01	0.008
Beacon	primisulfuron	0.38 oz	4.7	0.63	0.241
Beacon	primisulfuron	0.76 oz	1.7	0.10	0.054
UpBeet	triflusulfuron	0.25 oz	3.3	0.71	0.284
UpBeet	triflusulfuron	0.5 oz	1.9	0.42	0.180
Amber	triasulfuron	0.17 oz	0.0	0.00	0.000
Amber	triasulfuron	0.35 oz	0.0	0.00	0.000
Motive	imazamox	0.16 pt	0.0	0.00	0.000
Motive	imazamox	0.32 pt	0.0	0.00	0.000
Exceed	primisulfuron + prosulfuron	0.5 oz	0.0	0.00	0.000
Exceed	primisulfuron + prosulfuron	1 oz	0.0	0.00	0.000
Assert	imamethabenz	0.75 pt	3.8	0.71	0.195
Assert	imamethabenz	1.5 pt	0.6	0.11	0.047
R-11	---	0.25% v/v	2.7	1.59	0.564
untreated	---	---	4.1	2.37	0.872
LSD <sub>0.05</sub>	---	---	0.9	0.29	0.104