

**Project No:** 13C 3419 5229

**Title:** Perennial Weed Control in Blueberries

**Reporting Period:** FY 2004-2005

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**Accomplishments:** Three studies were conducted in 2004-05: a new herbicide screen, and two comparisons of four management systems for controlling established perennial weeds in blueberries. These systems were (1) an organic system, (2) a low herbicide input system, (3) a high herbicide input system, and (4) a combination conventional/organic system.

**Results:**

*Herbicide Screen:* Blueberries of many different cultivars were treated with directed sprays of eight herbicides April 1, 2004. No products caused obvious injury to any of the cultivars tested, indicating that all products show promise for registration in blueberry. Weed control from Callisto (mesotrione) was particularly effective, resulting in 84 to 97% weed control in July (Table 1). Sandea (halosulfuron) and Spartan (sulfentrazone) also provided good control (71 to 87%).

*Management System Trial:* ‘Elliot’ was used in the first iteration of this two-year trial (which concluded this fall) and ‘Nelson’ was used in the second iteration. Each plot included one row of blueberry bushes and was 30 feet long. Specified plots received initial sawdust mulch and diuron application, pine oil, flame, Stinger, or Roundup. Berries were picked by hand twice each year in ‘Elliot’ plots and three times in the first harvest in ‘Nelson’ plots.

There were no significant differences in blueberry yield or fruit size between systems for “Elliot” (Table 2). Increasing herbicide inputs did not result in significantly more or larger fruit, although those trends were apparent in the data. Perhaps more importantly, it did not appear that any system caused reductions in fruit yield or size during the either year of implementation. Pine oil did not apparently alter the flavor of blueberries from treated plots nor greatly affect bird predation in those plots, although those observations were not measured in a systematic way. There was no clear trend in the ‘Nelson’ yield data, with only the 3<sup>rd</sup> pick fruit weight showing reductions with high herbicide and combination treatments (Table 3).

Weed cover also did not greatly differ between systems (Tables 4 and 5). Field horsetail cover during the first season was greatest in the high herbicide system for both iterations, but cover in second year ‘Elliot’ plots did not differ. This likely resulted because none of the herbicides in that system used to date (diuron, Stinger, or Roundup) typically provide much control of that field horsetail. Pine oil appears to have some effect on field horsetail re-growth, since the two systems using pine oil (organic and combination) recorded lowered horsetail cover. Growth of Canada thistle and other established perennials was reduced in herbicide systems during Year 1 in ‘Nelson’ plots, but there was no difference in cover of annual weeds.

Appendix. Data tables.

Table 1. Weed control from applications of several herbicides in established blueberries (2004).

Treatment	Rate	Weed control	
		4/20	7/9
Prowl	4.2 pt	3	26
Outlook	2 pt	4	43
Dual Magnum	2 pt	4	45
Spartan + nis	6.4 oz + 0.025%	77	71
Chateau + nis	12.2 oz + 0.025%	40	68
Axiom + nis	13 oz + 0.025%	16	66
Callisto + coc	3.2 fl.oz + 1%	64	84
Callisto + coc	6.4 fl.oz + 1%	75	89
Callisto + coc	9.6 fl.oz + 1%	80	97
Sandea + nis	1.5 oz + 0.025%	18	87
Sandea + nis	2 oz + 0.025%	25	77
LSD <sub>0.05</sub>	---	13	22

Table 2. Blueberry yield and fifty-berry weights blueberry for four weed control systems in 'Elliot'.

Treatment	Yield			Fifty-berry weights		
	1 <sup>st</sup> pick	2 <sup>nd</sup> pick	total	1 <sup>st</sup> pick	2 <sup>nd</sup> pick	Average
	kg/plot	kg/plot	kg/plot	g/50 berries	g/50 berries	g/50 berries
2003 Pick						
Organic	7.06	6.60	13.67	70.7	61.7	66.2
Low herbicide	6.21	8.00	14.21	72.7	65.0	68.8
High herbicide	7.38	8.67	16.04	75.7	62.3	69.0
Combination	6.33	5.91	12.24	76.3	57.0	66.7
LSD <sub>0.05</sub>	ns	ns	ns	ns	ns	ns
2004 Pick						
Organic	10.71	2.14	12.85	69.7	55.7	62.7
Low herbicide	13.22	3.17	16.39	68.0	55.0	61.5
High herbicide	15.04	3.57	18.61	77.7	56.7	67.2
Combination	10.08	1.76	11.84	61.7	58.7	60.2
LSD <sub>0.05</sub>	ns	ns	ns	ns	ns	ns
Total						
Organic	17.77	8.74	26.51	70.2	58.7	64.4
Low herbicide	19.42	11.18	30.60	70.3	60.0	65.2
High herbicide	22.41	12.24	34.65	76.7	59.5	68.1
Combination	16.41	7.67	24.08	69.0	57.8	63.4
LSD <sub>0.05</sub>	ns	ns	ns	ns	ns	ns

Table 3. Blueberry yield and fifty-berry weights blueberry for four weed control systems in 'Nelson'.

Treatment	Yield				Fifty-berry weights			
	1 <sup>st</sup> pick	2 <sup>nd</sup> pick	3 <sup>rd</sup> pick	total	1 <sup>st</sup> pick	2 <sup>nd</sup> pick	3 <sup>rd</sup> pick	Average
	kg/plot	kg/plot	kg/plot	kg/plot	g/50 berries	g/50 berries	g/50 berries	g/50 berries
2004 Pick								
Organic	0.18	4.57	2.89	7.63	79.0	81.3	79.0	79.8
Low herbicide	0.20	4.76	3.82	8.78	71.0	86.7	70.1	76.1
High herbicide	0.24	2.58	1.17	3.99	75.7	84.3	74.7	78.2
Combination	0.20	3.69	1.57	5.45	75.0	83.3	80.3	81.5
LSD <sub>0.05</sub>	ns	ns	1.84	ns	ns	ns	ns	ns

Table 4. Weed control for four weed management systems in 'Elliot' blueberries.

Treatment	Canada thistle		Field horsetail		Other perennials		Annuals	
	10/24/03	7/16/04	10/24/03	7/16/04	10/24/03	7/16/04	10/24/03	7/16/04
	% cover	% cover	% cover	% cover	% cover	% cover	% cover	% cover
Organic	25	45	2	8	1	10	2	8
Low herbicide	30	13	18	4	0	0	10	0
High herbicide	10	7	43	4	2	0	2	0
Combination	27	15	5	7	0	3	4	3
LSD <sub>0.05</sub>	ns	ns	18	ns	ns	ns	ns	ns

Table 5. Weed control for four weed management systems in 'Nelson' blueberries (July, 2004).

Treatment	Canada thistle	Field horsetail	Other perennials	Annuals
	% cover	% cover	% cover	% cover
Organic	50	22	42	15
Low herbicide	5	8	5	8
High herbicide	8	42	5	13
Combination	2	13	28	12
LSD <sub>0.05</sub>	30	12	18	ns