

Progress Report to the CI – November 2009

Reduced risk pesticide management strategies for Blackvine Weevil, blackheaded fireworm, and perennial weeds.

Kim Patten

Washington State University - Long Beach Research and Extension Unit
2907 Pioneer Rd., Long Beach WA 98631, 360-642-2031, pattenk@wsu.edu

Objectives:

1. Evaluate biorational insecticides for control of blackvine weevil.
2. Evaluate biorational insecticides for control of blackheaded fireworm using chemigation application methods.
3. Evaluate herbicide combinations of quinclorac, mesotrione and rimsulfuron for control of perennial broadleaf weeds in cranberries.

Results:

Evaluation of biorational insecticides for control of blackvine weevil:

Numerous experiments were conducted assessing new insecticides for weevil control (Figures 1 to 4). Based on sweeping post-treatment and one year after treatment, excellent control was achieved with indoxacarb.

Figures 1 and 2. Effects of indoxacarb and acetamiprid on adult weevil population in cranberries.

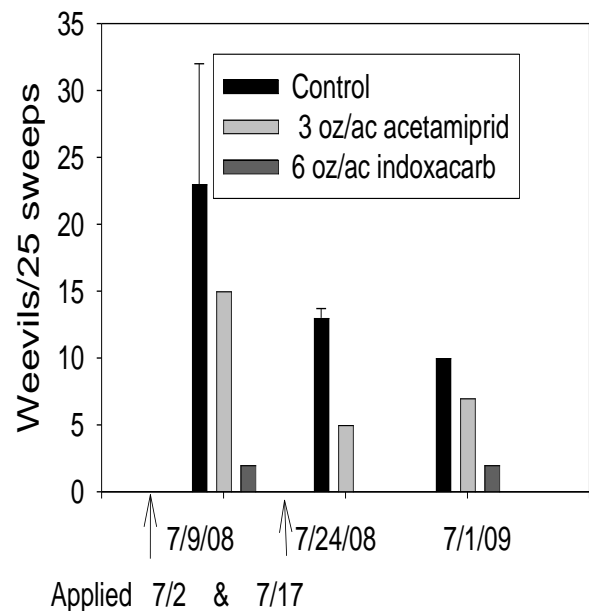
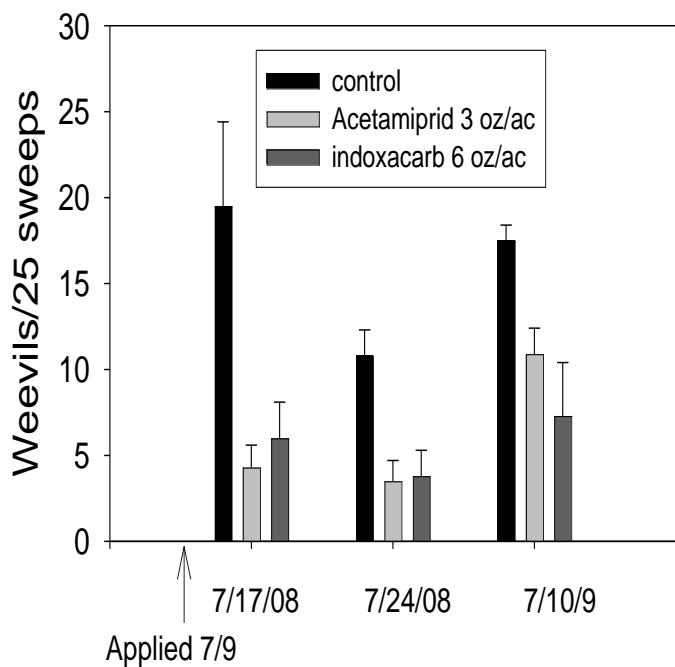
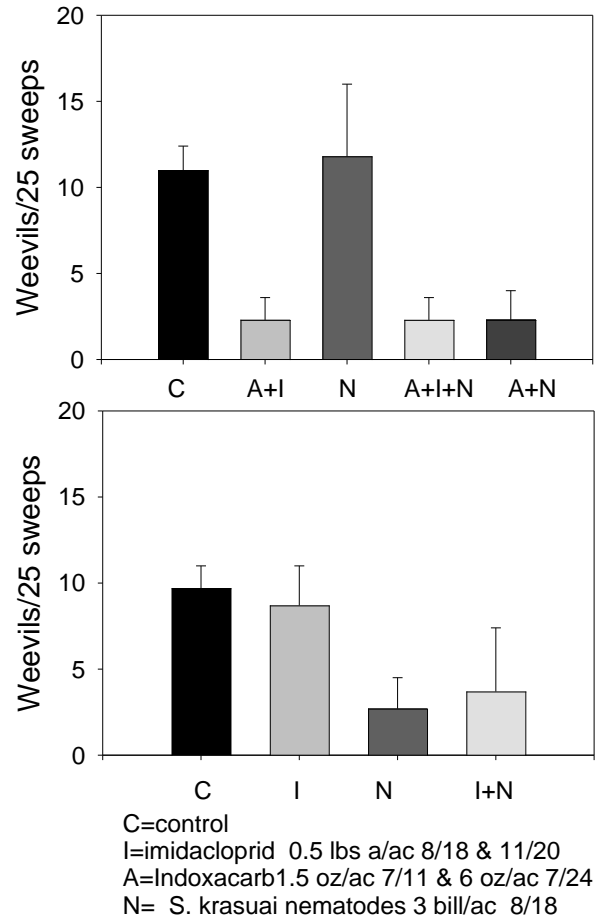
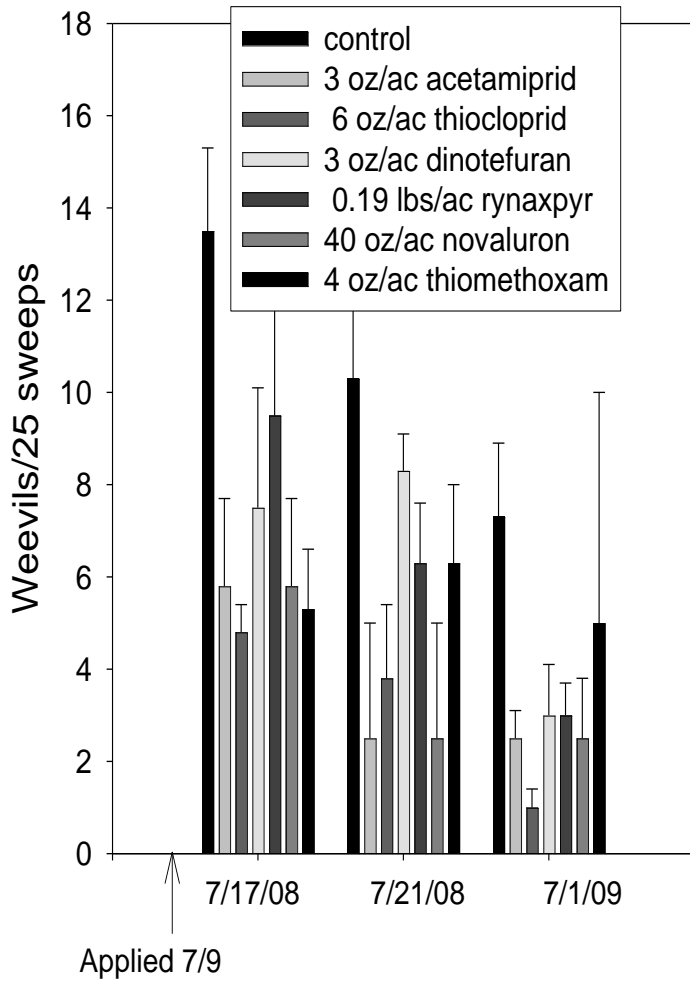


Figure 3 and 4. Effects of several insecticides and biocontrols on adult weevil populations in cranberries.



Evaluation of biorational insecticides for control of blackheaded fireworm (BHFW):

Several studies were conducted to assess efficacy of different chemistries on BHFW using chemigation. Low counts and grower over-sprays confounded the results of some of these studies (data not shown). Mixed results were obtained for the other studies. Results across these trials indicate at least one of the chemigated biorational chemistries was as effective as Diazinon (Table 1, Figures 5 & 6).

Treatment		# dead larvae /5 sweeps	# alive larvae /5 sweeps	Total larvae /5 sweeps
CONTROL		0.0 a	1.3 a	1.3 ab
DIAZINON AG600 (chemigation)	2 qt/a	0.3 a	0.0 a	0.3 b
Spinetoram (broadcast w/ 1 qt/a Agridex)	3.25 oz wt/a	0.3 a	0.5 a	0.8 ab
Spinetoram (chemigation)	3.25 oz wt/a	0.8 a	0.3 a	1.0 ab
Spinetoram (chemigation)	6.5 oz wt/a	0.3 a	0.5 a	0.8 ab
DPX E2Y45 (chemigated)	0.066 lb ai/a	0.5 a	0.3 a	0.8 ab
Cyazypyr (HGW 86) (chemigation)	10.1 fl oz/a	1.5 a	0.5 a	2.0 ab
Cyazypyr (HGW 86) (chemigation)	13.5 fl oz/a	1.0 a	0.0 a	1.0 ab
Novaluron (broadcast w/ 1 qt/a Agridex)	12 fl oz/a	1.8 a	1.5 a	3.3 a
Novaluron (chemigation)	12 fl oz/a	0.5 a	0.3 a	0.8 ab
Novaluron (broadcast w 1 qt/ac Agridex)	30 fl oz/a	0.3 a	0.3 a	0.5 b
Novaluron (chemigation)	30 fl oz/a	0.5 a	0.3 a	0.8 ab
LSD (P=.05)		1.11	0.95	1.55
Treatment Prob(F)		0.0678	0.0669	0.0353

Sweeping data collected 4 days after treatment. Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Figure 5. Efficacy of chemigated insecticide on second generation fireworm control based on fruit damage assessments.

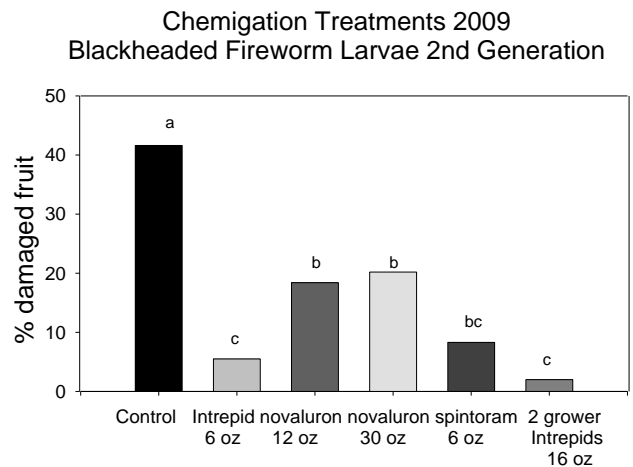
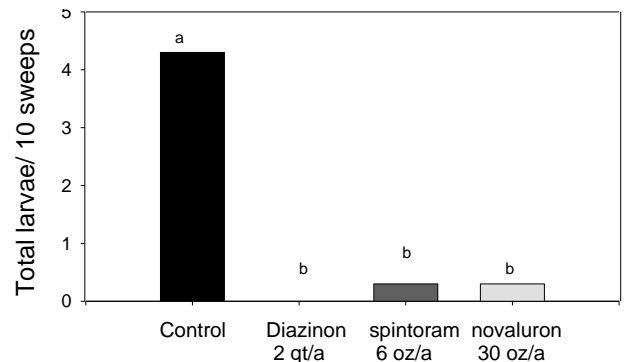


Figure 6. Efficacy of chemigated insecticide on second generation fireworm control based on sweeping.



Evaluation new herbicide for control of perennial broadleaf weeds in cranberries:

Several studies were conducted to assess the efficacy of new herbicides on a series of annual and perennial weeds in cranberries. Results are presented in Tables 2 to 8. Quinclorac was only marginally effective across a range of cranberry weeds. Rimsulfuron was very efficacious and did not damage the crop. Clethodim was the only herbicide that provided excellent grass control. The addition of other herbicides to the tank mix did not enhance its efficacy.

Table 2. Effects of several herbicides on perennial grass control in cranberries.

Treatment	% control Reed Canary Grass		
	May 18	June 3	June 29
Clethodim 0.5% w/ 1% crop oil	68.3 A	68.3 a	65.0 ab
Rimsulfuron 2 oz/a + Clethodim 0.5% w/ 1% crop oil	71.7 A	56.7 a	85.0 a
Quinclorac 8 oz/a + Rimsulfuron 2 oz/ac w/ w/ 1% crop oil	30.0 B	70.0 a	56.7 b
Quinclorac 8 oz/a + Rimsulfuron 2 oz/a + Clethodim 0.5% w/ 1% crop oil	76.7 A	70.0 a	78.3 ab
control	0.0 C	0.0 b	0.0 c
LSD (P=.05)	6.88	19.67	19.90
Treatment Prob(F)	0.0001	0.0001	0.0001
Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)			

Table 3. Effects of several herbicides on perennial grass control in cranberries.

Treatment	Six-weeks fescues			Bentgrass				
	% Control			% cover	% Control			% cover
	May 5	June 6	June 29	Aug 8	May 5	June 6	June 29	Aug 8
Control	0.0 d	0.0 d	0.0 c	76.3 a	0.0 c	0.0 d	0.0 c	68.8 a
Rimsulfuron 1 oz/ac w/ 1% Agridex	93.3 a	93.0 a	73.8 a	42.5 a	68.8 a	27.5 b	2.5 c	75.0 a
Clethodim 0.5% w/ 1% Agridex	97.8 a	86.3 ab	65.0 ab	48.8 a	98.5 a	97.8 a	92.3 a	21.3 b
Quinclorac 8 oz/ac w/ 1% Agridex	30.0 c	0.0 d	5.0 c	71.3 a	30.0 b	18.8 c	0.0 c	86.3 a
Rimsulfuron 1 oz/ac + Clethodim 0.5% w/ 1% Agridex	95.5 a	78.8 bc	48.8 b	80.0 a	97.8 a	96.5 a	82.5 b	33.8 b
Quinclorac 8 oz/ac w/ 1% Agridex	75.0 b	72.5 c	2.5 c	91.3 a	20.0 bc	5.0 d	0.0 c	95.0 a
Quinclorac 8 oz/ac + Clethodim 0.5%+ Rimsulfuron 1 oz/ac w/ 1% Agridex	94.5 a	86.3 ab	42.5 b	45.0 a	96.5 a	100.0 a	96.0 a	20.0 b
LSD (P=.05)	14.38	7.74	19.38	32.75	23.62	5.12	5.43	35.32
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0002	0.0001	0.0001	0.0001	0.0504
Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)								

Table 4. Effects of rimsulfuron rates (Rimsulfuron) on cranberry yield.

Treatment	Yield bbl/ac	
	Site 1	Site 2
Control	188.3 b	71.1 a
Rimsulfuron 2 oz wt/a twice		104.0 a
Rimsulfuron 4 oz wt/a twice	353.4 a	98.9 a
Rimsulfuron 8 oz wt/a twice	450.1 a	92.7 a
LSD (P=.05)	157.68	43.61
Treatment Prob(F)	0.0180	0.4191

Treatment	% control			
	Lotus	Sour-dock	False geranium	Marsh St. John Wort.
Control - White	0.0 b	0.0 b	0.0 b	0.0 a
Rimsulfuron	78.3 a	92.5 a	90.0 a	62.5 a
LSD (P=.05)	61.27	4.59	11.25	68.89
Treatment Prob(F)	0.0315	0.0001	0.0001	0.0632

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Treatment	% Control							
	Corn Spurry		Smartweed		Horsetail		Silver leaf	
	June 12	July 14	June 12	July 14	June 12	July 14	June 12	July 14
Control	0.0 b	0.0 b	0.0 b	0.0 b	0.0 c	0.0 c	0.0 c	0.0 b
Rimsulfuron 1 oz/a	30.0 ab	83.0 a	94.5 a	100.0 a	86.3 a	53.3 ab	10.0 bc	66.7 a
Rimsulfuron 2 oz/a	51.5 ab	96.3 a	33.3 b	100.0 a	56.7 ab	81.7 a	68.8 ab	85.0 a
Quinclorac 8 oz/a	0.0 b	0.0 b	0.0 b	0.0 b	0.0 c	70.0 a	30.0 abc	12.5 b
chlorimuron 0.75 oz/a	86.0 a	100.0 a	99.8 a	77.5 a	55.0 ab	72.5 a	78.8 a	96.3 a
Callisto 8 oz/a + Clethodim 8 oz/a	89.3 a	100.0 a	99.5 a	100.0 a	26.3 bc	20.0 bc	85.0 a	100.0 a
Clethodim 8 oz/a + Callisto 8 oz/a +Classic 0.75 oz/a	82.5 a	98.8 a	99.3 a	100.0 a	75.0 a	86.0 a	78.3 a	100.0 a
Rimsulfuron	35.0 ab	87.5 a	95.0 a	100.0 a	50.0 ab	90.0 a	30.0 abc	66.7 a
LSD (P=.05)	45.01	13.47	32.59	25.53	30.44	35.28	43.70	31.60
Treatment Prob(F)	0.0008	0.0001	0.0001	0.0001	0.0001	0.0004	0.0028	0.0001

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Treatment	% control August 18	
	Willow	St John Wort
Control	0.0 b	0.0 b
Rimsulfuron 2oz/a twice	92.5 a	100.0 a
Rimsulfuron 4 oz/a -	85.0 a	85.0 a
LSD (P=.05)	28.98	23.78
Treatment Prob(F)	0.0004	0.0001

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Treatment	% Control July 27	
	Willow	Yellow Weed
Control	0.0 b	0.0 b
Rimsulfuron 2oz/ac	41.7 a	76.7 a
Quinclorac 8 oz/a + Callisto 8 oz/a	81.7 a	68.3 a
Rimsulfuron 2 oz/ac Quinclorac 8 oz/a + Callisto 8 oz/a	75.0 a	70.0 a
LSD (P=.05)	36.97	29.92
Treatment Prob(F)	0.0057	0.0023

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Table 9. Effect of rimsulfuron and quinclorac on control of perennial weeds in cranberries.			
Treatment	% control		
	Buttercup	Silver leaf	Horsetail
Control	0.0 c	0.0 a	0.0 b
Rimsulfuron 4 oz/a	78.3 ab	40.0 a	25.0 b
Rimsulfuron 2 oz/a twice	100.0 a	40.0 a	17.5 b
Quinclorac 8 oz/a twice	0.0 c	0.0 a	0.0 b
Quinclorac 8 oz + Callisto 8 oz/a twice	42.7 b	75.0 a	55.0 ab
Rimsulfuron 2 oz/a + Quinclorac 8 oz + Callisto 8 oz/a twice	100.0 a	53.3 a	96.7 a
Rimsulfuron 4 oz/a + Quinclorac 8 oz + Callisto 8 oz/a	70.0 ab	92.5 a	93.3 a
LSD (P=.05)	34.29	69.95	46.04
Treatment Prob(F)	0.0001	0.1035	0.0053
Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)			