FINAL REPORT
WTFRC Project #ST-05-501 **WSU Project # 13C**-3343-6124

Project Title: Peach Twig Borer Management in Stone Fruits

PI: Doug Walsh
Organization: WSU Prosser
Telephone/email: 509.786.9287 dwalsh@wsu.edu
Address: 24106 North Bunn Rd
City: Prosser
State/Province/Zip WA, 99350

Cooperators: H. Ferguson, Extension IPM Coordinator Specialist, WSU Entomology
T. Waters, Project Assistant, WSU Entomology
F. Zalom, Extension Agronomist, UC Davis Entomology

Budget History:

Item	**Year 1:** 2005	**Year 2:** 2006
Salaries		
Benefits		
Wages		
Benefits		
Equipment		
Supplies		
Travel		
Miscellaneous		
Total	15,000*	10,000*

*/ These amounts correspond to the funding amount that the WTFRC provided for each of the years of the project. The allocation was substantially less then what was initially requested, so a budget breakdown is difficult to provide.

Significant Findings: Properly timed insecticide applications can control peach twig borer in stone fruit orchards. There does not appear to be any significant resistance of peach twig borer to registered insecticides. Several candidate insecticides were very effective at controlling peach twig borer. These include acetimiprid and DE-175. Acetimiprid should be registered for use on stone fruits by this coming spring. It is a neonicotinyl insecticide that also provides good control of aphids that can infest stone fruits. DE-175 is Dow Agrosciences more potent spinosyn compound. It will provide more effective control of PTB then Spinosad for conventional stone fruit growers. Spinosad in the Entrust formulation will still be the standard for organic growers.

Results and discussion:

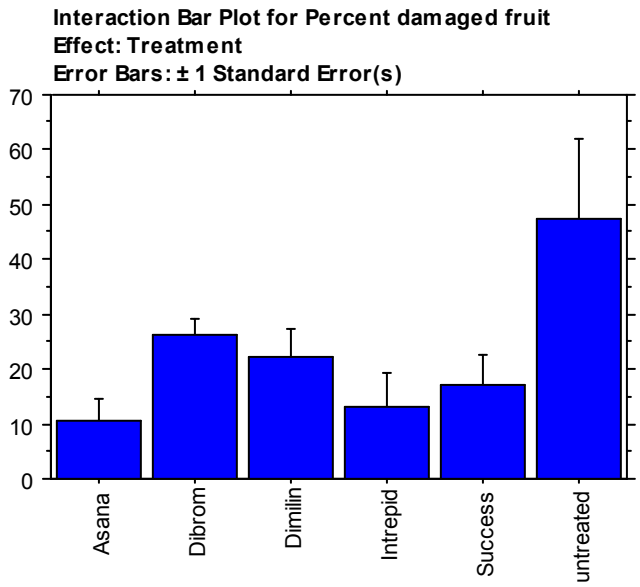
Objective 1. Test the field efficacy of registered and candidate compounds against PTB during the overwintering and subsequent summer generations.

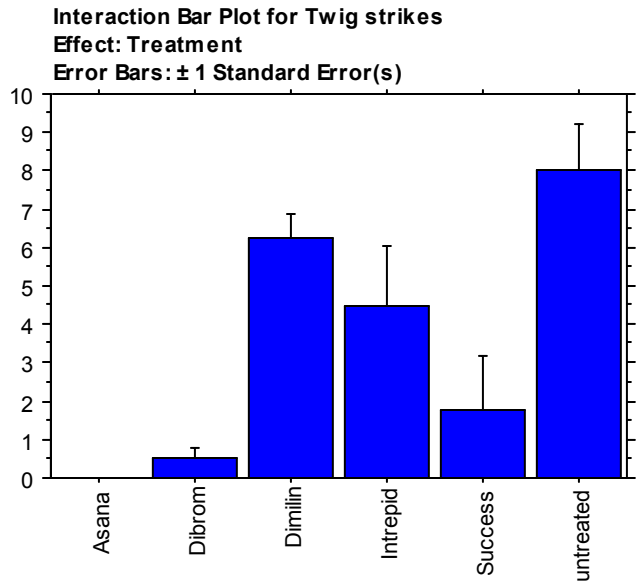
Methods and Results

In spring 2005 we attempted to evaluate the field efficacy of novaluron, imidan, dimilin, spinosad, methoxyfenozide, Bts and pyrethroids against PTB on the overwintering generation in a peach orchard location at Douglas fruit near Pasco, Washington in April 2005. Unfortunately after several sprays the pest pressure was nonexistent and the research plot proved to have very little value. We are confident that we were not accidentally treated by our cooperator because the aphid population in our study plots flared and we needed to come back through our plots and treat the aphid population with Pravado. In the adjacent orchard Lorsban had been sprayed after petal fall. There were no aphids present where Lorsban had been sprayed. There were just no PTB present.

In summer 2005 we conducted a summer field trial near Prosser WA in a small homeowner orchard. Twenty four trees in total were used. Fruit was thinned to 8 fruit per branch. The trees had been established from bare root peach trees purchased at Lowe's in Kennewick in 1999. The current and former homeowner did not remember which variety was planted. These trees were heavily infested with PTB in the spring. Five insecticide treatments and a non treated control were applied to 4 replicate trees per treatment. All treatments were tank mixed with JMS Stylet oil at 1% and applications were applied at approximately 100 gallons per acre with a gas powered duster mister backpack sprayer. The insecticides were applied on 9 June 2005. Fruit and twigs were evaluated on 13 July 2005

Treatment #	Treatment	Rate (form)
1	untreated	
2	Dimilin	12 oz
3	Success	6 oz.
4	Intrepid	10 oz.
5	Asana	8 oz.
6	Dibrom	3 pts





The pest pressure was extremely high in this home owner orchard. All of the treatments were statistically effective.

On March 30, 2006 candidate insecticides were applied to 2 yr old peach trees cv. *Elberta* in small orchard near Prosser, WA. Candidate compounds that were applied included Asana (esfenvaletrate), Assail 30 SG (acetimiprid), DE175 (a new spinosyn), Dibrom (naled), Lorsban 4E (chlorpyrifos), Success (Spinosad), Rimon (novaluron), and Warrior CS (λ-cyhalothrin). All of the treatments were tank mixed with 2% JMS Stylet Oil. Each treatment was applied to 9 single replicated trees with an Echo Duster Mister gas powered sprayer. Twig strikes per tree were evaluated on 19 April, 2006.

Anova results for

		Mean Squares
Treatment	*df*=10	10.83**
Error	*df*=88	0.80

Treatment	Rate	Twig Strikes±Std Error on 19 April
Untreated control		3.89±0.42
Asana XL	8 oz	0.22±0.22**
Assail 30 SG	5 oz	0.66±0.37**
Assail 30 SG	8 oz	0.33±0.23**
DE 175	0.045 lb ai	0.11±0.11**
Dibrom	3 pints	0.66±0.23**
Dimilin 4L	12 oz	0.88±0.31**
Lorsban 4EC	2 pints	0.66±0.37**
Rimon .083EC	12 oz	1.55±0.44**
Success	6 oz	0.33±0.23**
Warrior CS	3 oz	0**

**/ Twig strikes per tree are significantly (P<0.01) lower then untreated trees by pairwise *t*-test.

In September 2006 we conducted a fall field trial near Prosser WA in a small homeowner orchard. Thirty two trees in total were used. Fruit These trees were moderately infested with PTB in the spring. Five insecticide treatments and a non treated control were applied to 8 replicate trees per treatment. All treatments were applied at approximately 100 gallons per acre with a gas powered duster mister backpack sprayer. The insecticides were applied on 17 September 2005. Fruit and twigs were evaluated on 7 October 2005

Treatment	Rate	Twig Strikes±Std Error on 19 April
Untreated control		7.25±0.1.01
Asana XL	8 oz	0.37±0.0.26**
Assail 30 SG	8 oz	0.50±0.0.38**
Success	6 oz	0.62±0.0.32**

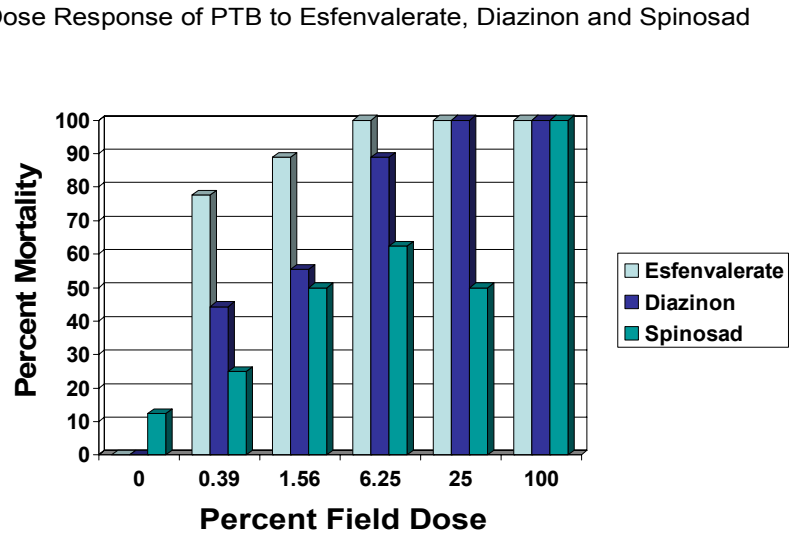
**/ Twig strikes per tree are significantly (P<0.01) lower then untreated trees by pairwise *t*-test.

Objective 2. Determine the susceptibility of PTB to registered and candidate insecticides.

Methods and Results.

Peach twig borer larva were collected over several days in early April 2005 and removed from their twig shoots in the laboratory. Insecticides were applied directly to the larvae by syringe in 1ul of acetone for diazinon and esfenvalerate and water for spinosad. Larvae were assessed at 24 after treatment for mortality.

Insecticide	ppm	% field Rate	Live@24h	Dead@24h	Total@24h
Acetone	0	0.00	9	0	9
esfenvalerate	60	100.00	0	9	9
esfenvalerate	15	25.00	0	9	9
esfenvalerate	3.75	6.25	0	9	9
esfenvalerate	0.9375	1.56	1	8	9
esfenvalerate	0.234	0.39	5	4	9
diazinon	10480	100.00	0	9	9
diazinon	2620	25.00	0	9	9
diazinon	655	6.25	3	6	9
diazinon	164	1.56	5	4	9
diazinon	41	0.39	6	3	9
Water	0	0.00	7	1	8
spinosad	50	100.00	0	8	8
spinosad	12.5	25.00	4	4	8
spinosad	3.12	6.25	4	4	8
spinosad	0.78	1.56	6	2	8
spinosad	0.19	0.39	6	2	8



PTB were susceptible to all 3 of the insecticides screened with this series of bioassays. There does not appear to be any level of tolerance to these insecticides within the PTB population in the Prosser, WA area.

Objective 3. Test the accuracy of the phenology models available for break from winter dormancy.

Two year old potted cling peach trees were placed near tree fruit orchards in Buena Naches, Prosser and Pasco growing districts during the fall of 2005. In our experience, young vigorously growing cling peach trees have proven to be the trees most susceptible to attack by PTB. These potted trees were removed from the orchard in early March and placed in close proximity to computerized weather stations in Prosser. All of the trees died. The study failed.