Challenges in Sustainable Support of Hudson Valley Agricultural Research

Hudson Valley Research Laboratory
February 25th, 2020

Hudson Valley Research Laboratory
7-Year Overview

2013 Steve Hoying & Dr.David Rosenberger retire

- Dean Kathryn Boor meets with HV tree fruit growers
- CALS to divest from support of HVRL
  - Plant pathology position withdrawn
  - Administrative Assistant position reduced to 50%
  - Salaries capped for Hort. & Entomologist, Farm Manager & AA
  - 5-year MOU developed between CALS & HVRL ($275,000)
  - CALS to transfer properties to HVRL,
- Growers meet together & agree to funding in support of the HVRL

Hudson Valley Research Laboratory
2020

- Updated MOU developed between CALS & HVRL
  - 10 years, CALS proprety retained
- Back-up generator 55kw support insect & disease colonies (‘16)
- ENYCHP specialists and technical support stationed at HVRL
  - Dan Donahue, Teresa Rusnik, Elizabeth Hgigins, Sarah Elone
- Hired plant pathologist (‘16) & new horticulturalist (’19)
- 3 additional vehicles to fleet (‘16, ‘18, ‘19)
- New Cab Franc & Pinot Noir Vineyard for long term research (‘18)
- Garage renovations, 2 additional coolers & welding shop (‘19)

Hudson Valley Research Laboratory
Board of Directors

Officers

Randal Pratt, President (2022)
Wilkens Fruit & Fir Farm

Thom Waz Vice-President (2021)
Lawrence Farm Orchards, Inc.

Brad Clarke, Sec.-Treasurer (2020)
Prospect Hill Orchards

Chris Belardi, MD (2022)
Rose Hill Farm

Board of Director Members

Sarah Dressel (2021)
Dressel Farms

Barth Davenport (2021)
Davenport Fruit Stand

Amy Hepworth (2021)
Hepworth Farms

Josh Morgenthau (2022)
Fishkill Farms

Robert Rowe (2021)
Rainy Day Greenhouse

Gary Samascott (2020)
Samascott Orchards, LLC

Kimberly A. Wagner, PhD (2022)
Stoutridge Vineyard, LLC

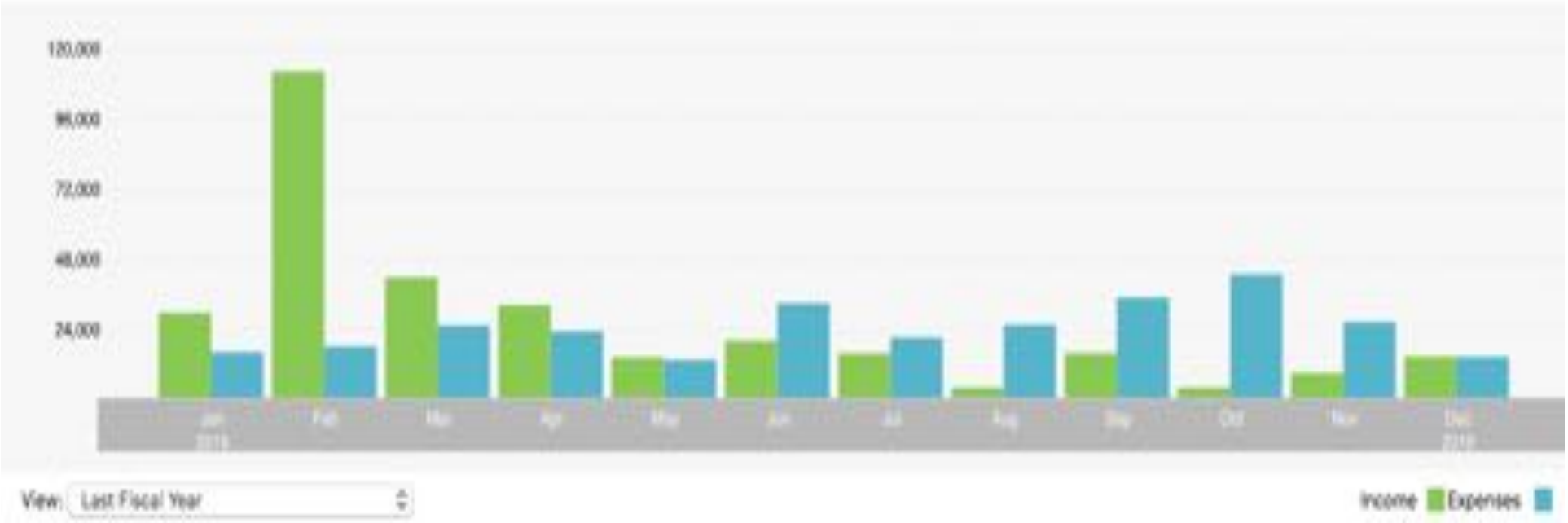
Administrative Assistant

Margret 'Peggy' Kent, HVRL AA as of Nov 2019
Locust Grove Fruit Farm – 8th generation

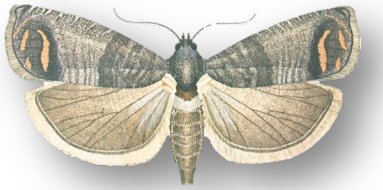
Hudson Valley Research Laboratory
Annual Budget

Average Annual Budget of $250,000

Annual Membership Meeting
Tentative Date of March 18th 3:00 pm
@ HVRL, Highland, NY



Tree Fruit Insect Pest Management Updates

ENYCHP Fruit & Vegetable Conference

February 25th, 2020
The Desmond Conference Center
660 Albany Shaker Road, Albany, NY

Peter Jentsch
Senior Extension Associate – Entomology

2020 Insect Pest Management Updates: Efficacy Screening & Invasive Insect Studies

Seasonal Information: HVRL / Jentsch Lab

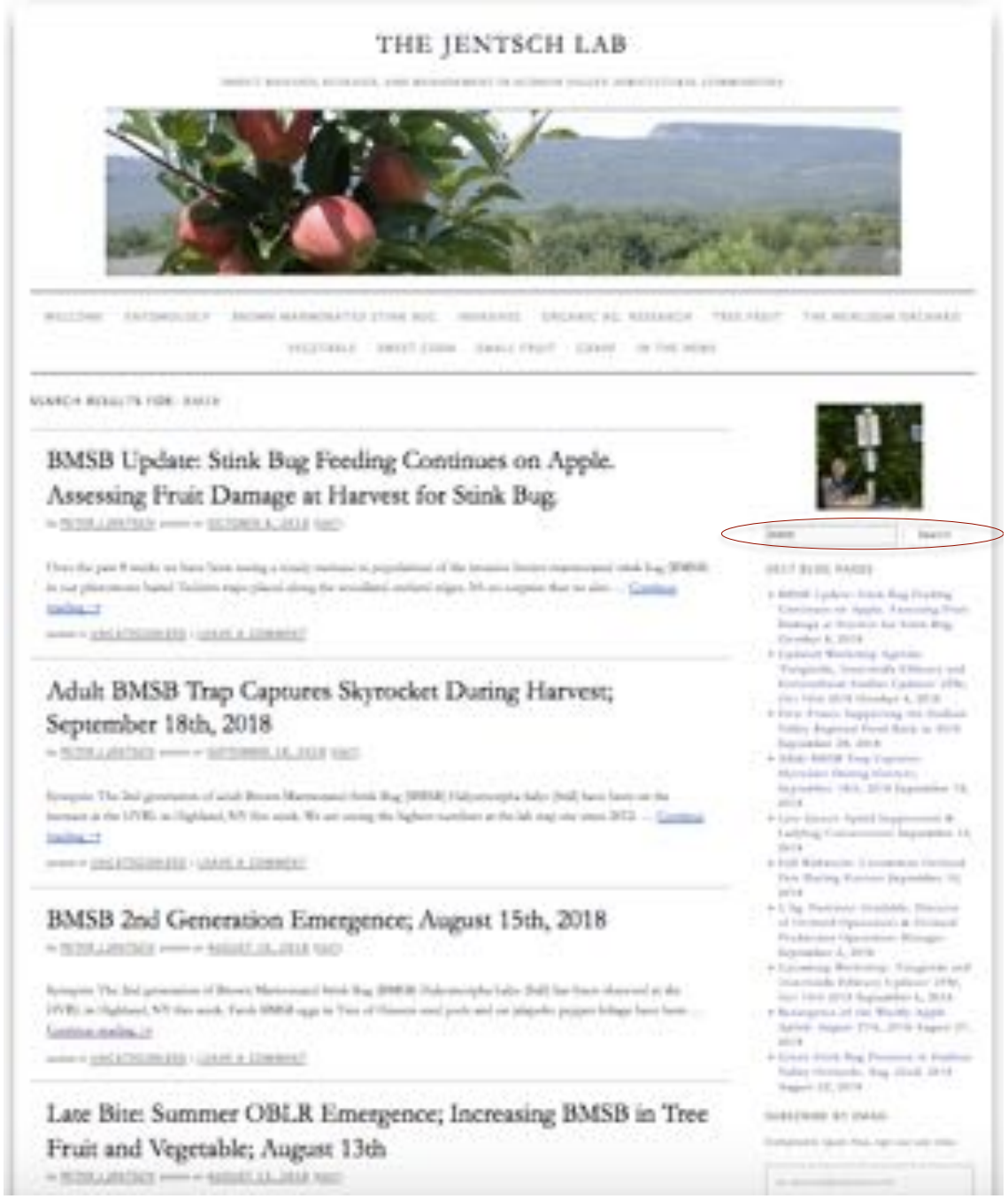
Insecticide Registration Updates (Recent Registrations)

Tree Fruit Insecticide Efficacy Studies

Invasive Insect Pest Complex Studies

http://blogs.cornell.edu/jentsch/presentations/

http://blogs.cornell.edu/jentsch/results-of-insecticide-and-acaricide-studies-in-eastern-new-york-cornell-universitys-hudson-valley-laboratory/



Subscribe to Email; Search Specific Insect Articles

Tree Fruit Insect Complex

Endemic Insect Pests - Resides within orchard

-Residual insecticide = increases selection pressure

-Lower susceptability to insecticides…high resistance potential

Migratory Insect Pests - Resides outside orchard

-Diverse gene pool

-Increased susceptability to insecticides

Tree Fruit Insect Complex

Endemic Insect Pests - Resides within orchard

-Residual insecticide presence = increases selection pressure

-Lower susceptability to insecticides

- Codling Moth (OFM, LAW, GFW, RBLR)
- Obliquebanded Leafroller
- Wooly Apple Aphid
- San Jose Scale

* Rosy Apple Aphid

* European Red Mite

Migratory Insect Pests - Resides outside orchard

-Diverse gene pool

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Tree Fruit Insect Complex

Endemic Insect Pests - Resides within orchard

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- San Jose Scale

* Rosy Apple Aphid
* European Red Mite

Migratory Insect Pests - Resides outside orchard

-Diverse gene pool

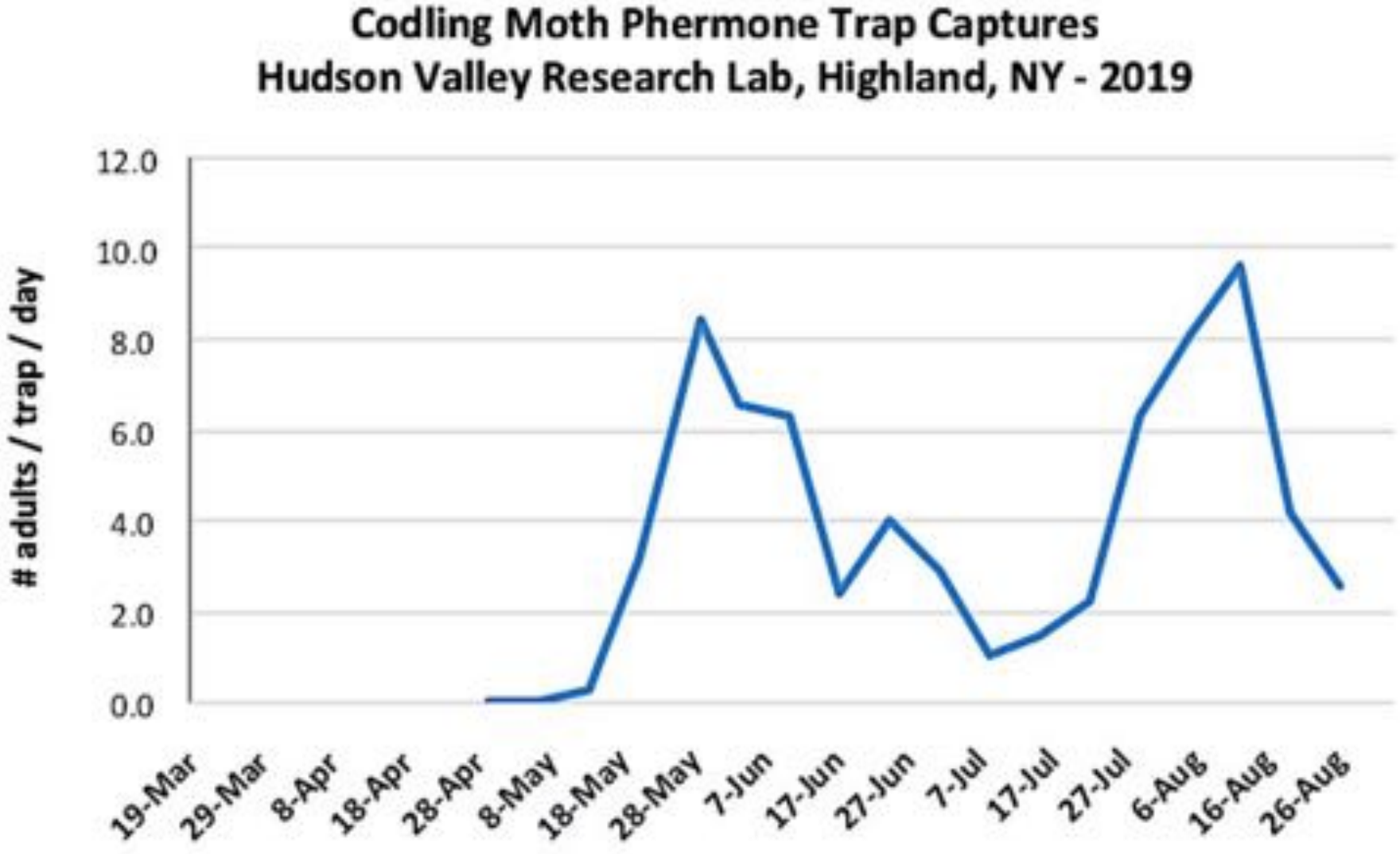
-Increased susceptability to insecticides

- Plum Curculio
- Apple Maggot

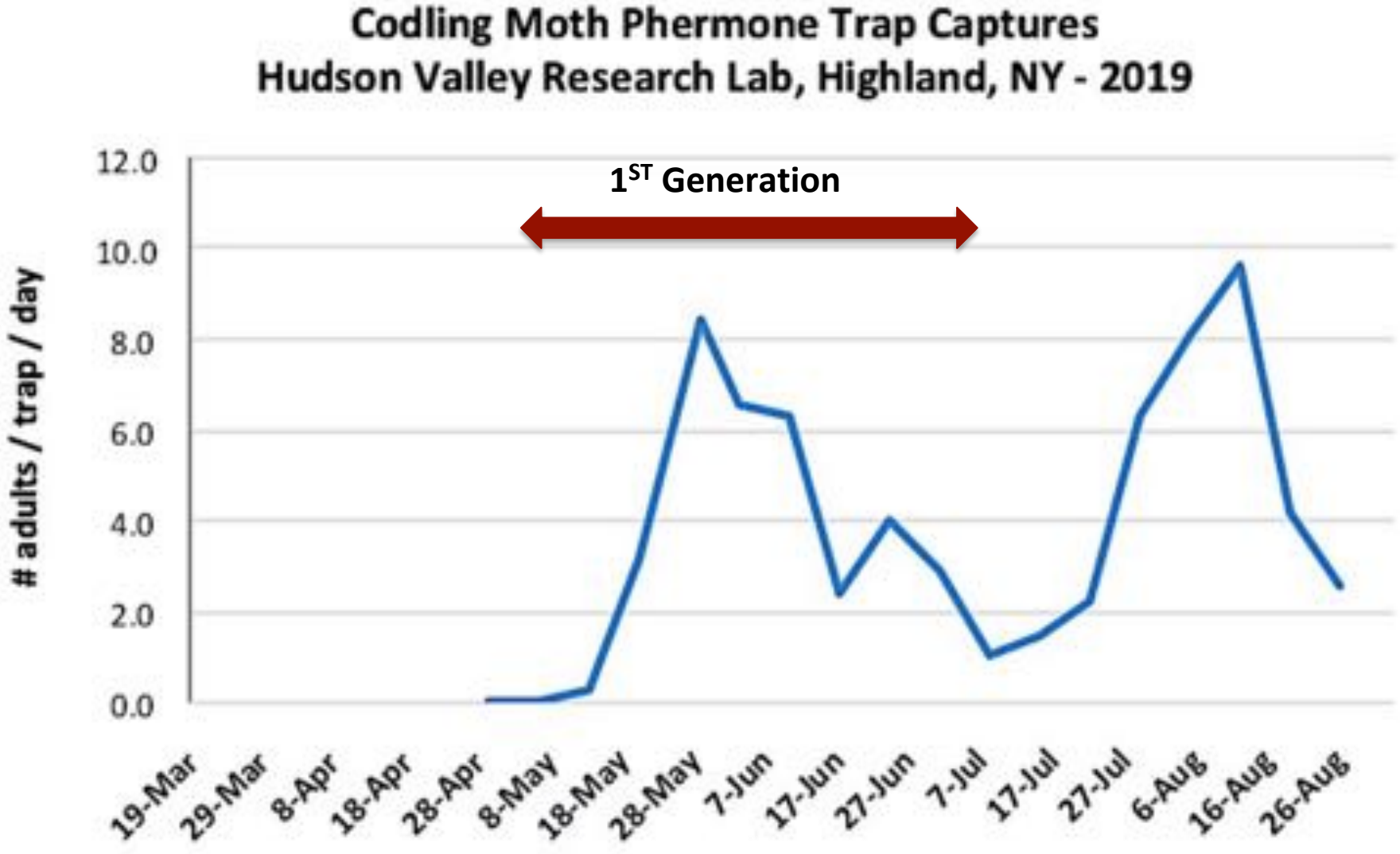
*White Apple, Rose & Potato Leafhopper

*Brown Marmorated & Native Stink Bugs

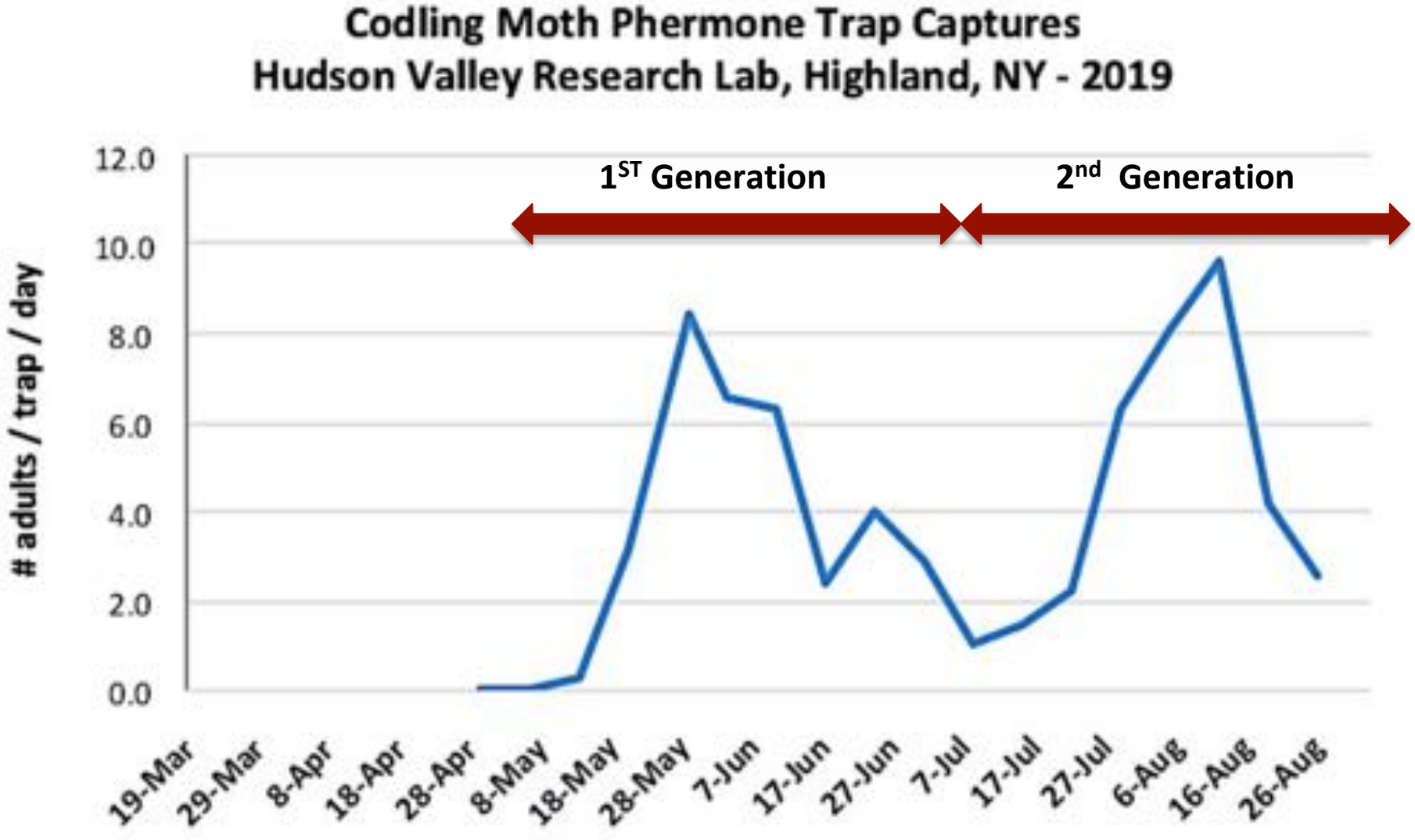
Tree Fruit Insect Complex



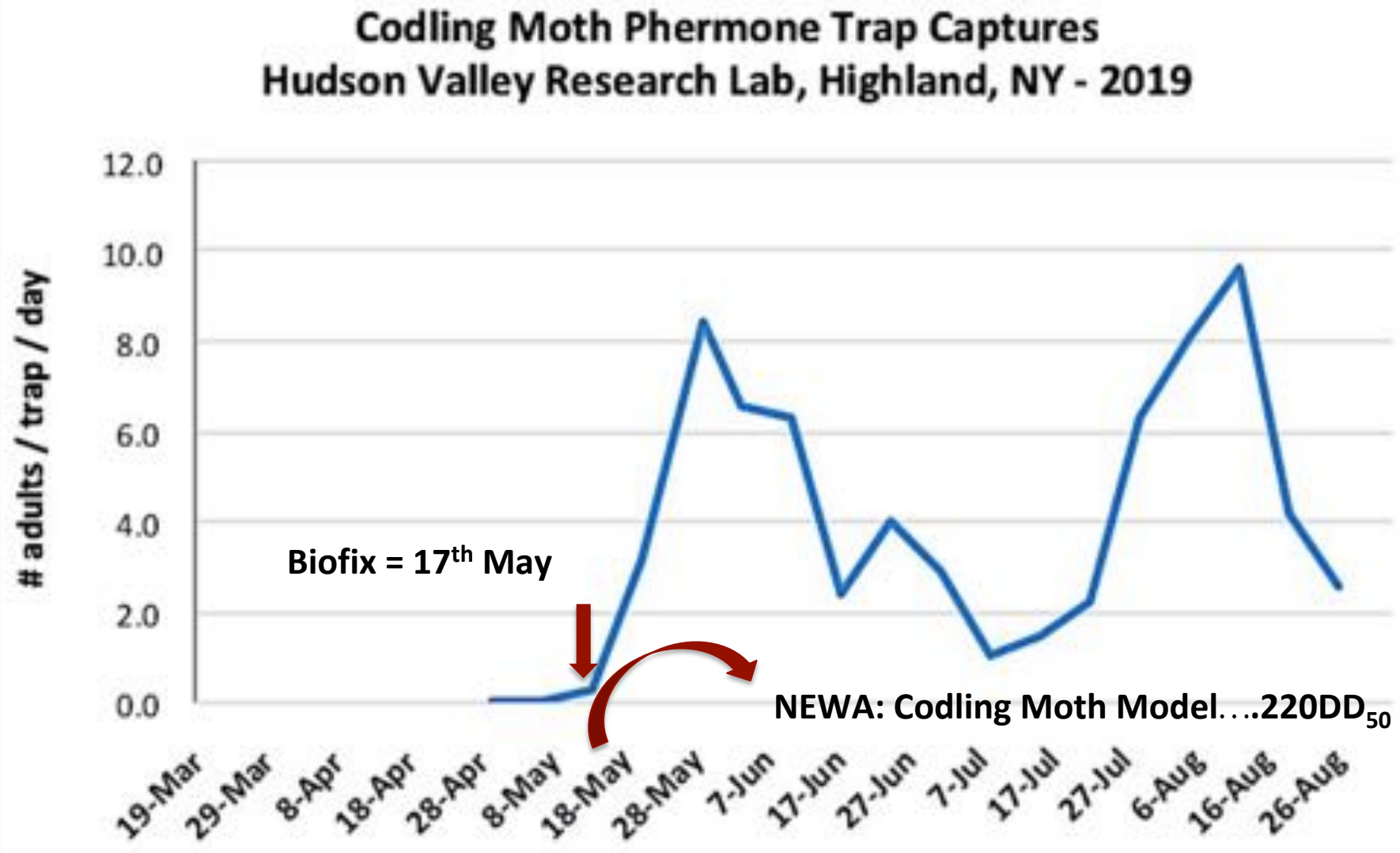
Tree Fruit Insect Complex



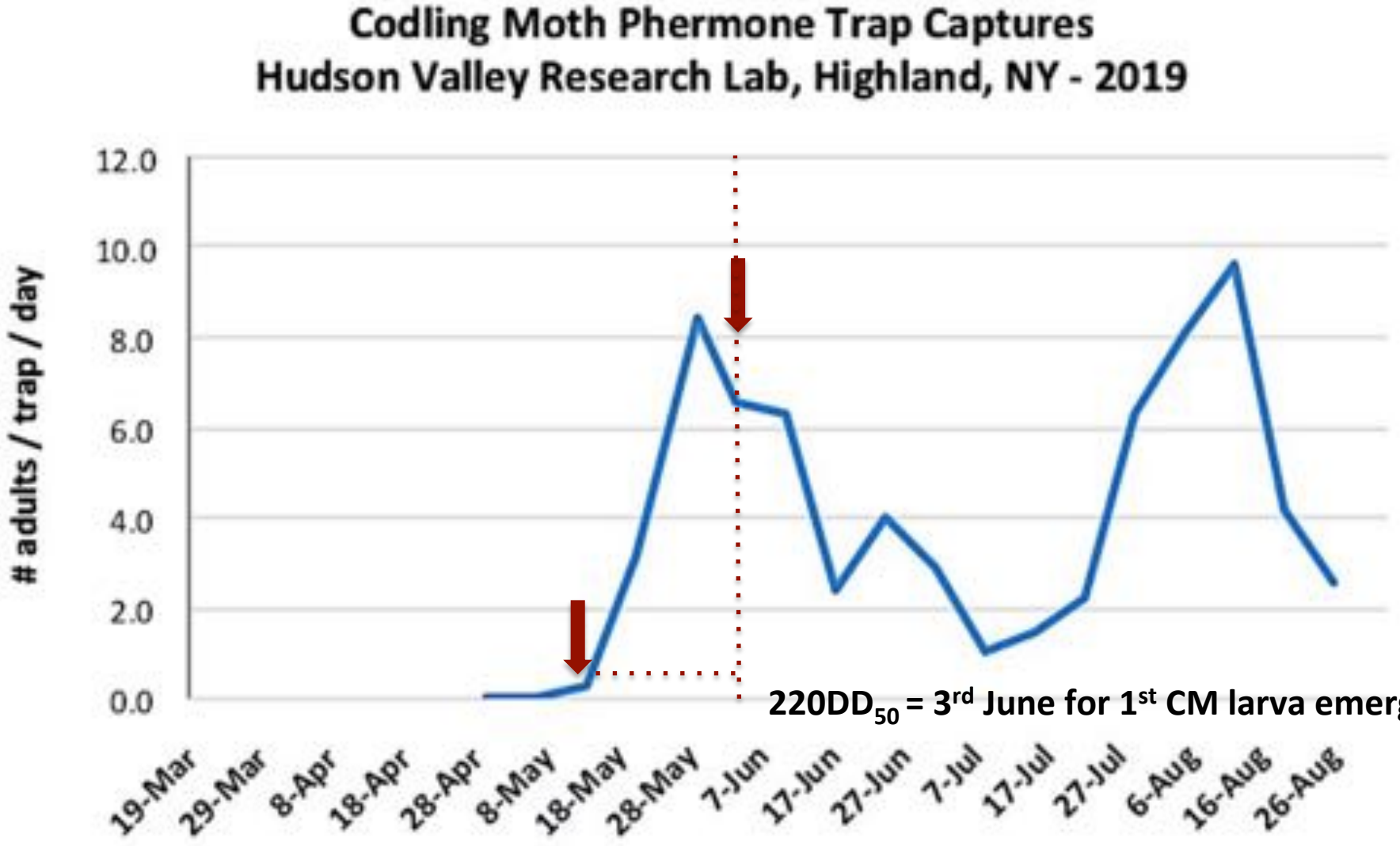
Tree Fruit Insect Complex



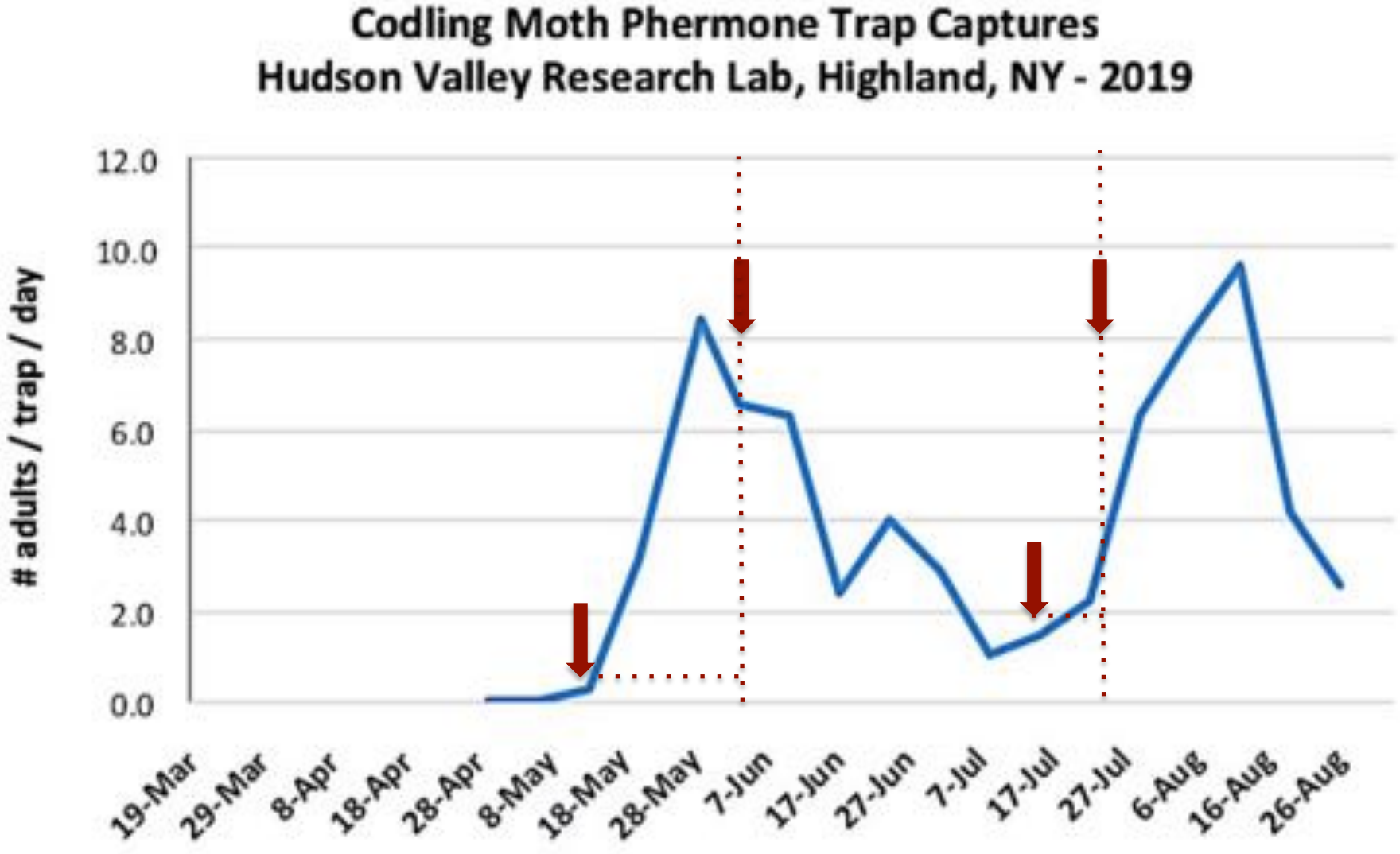
Tree Fruit Insect Complex



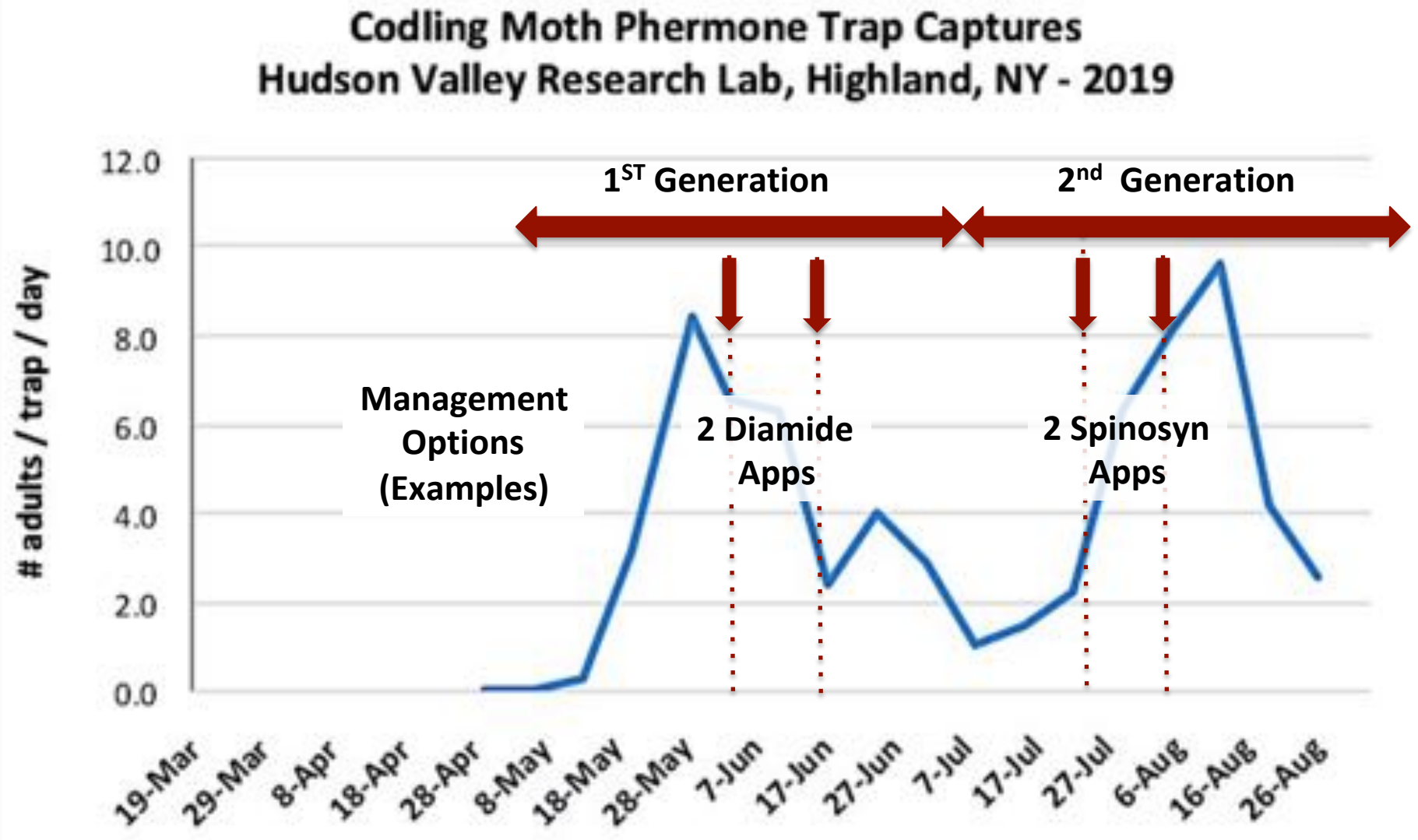
Tree Fruit Insect Complex



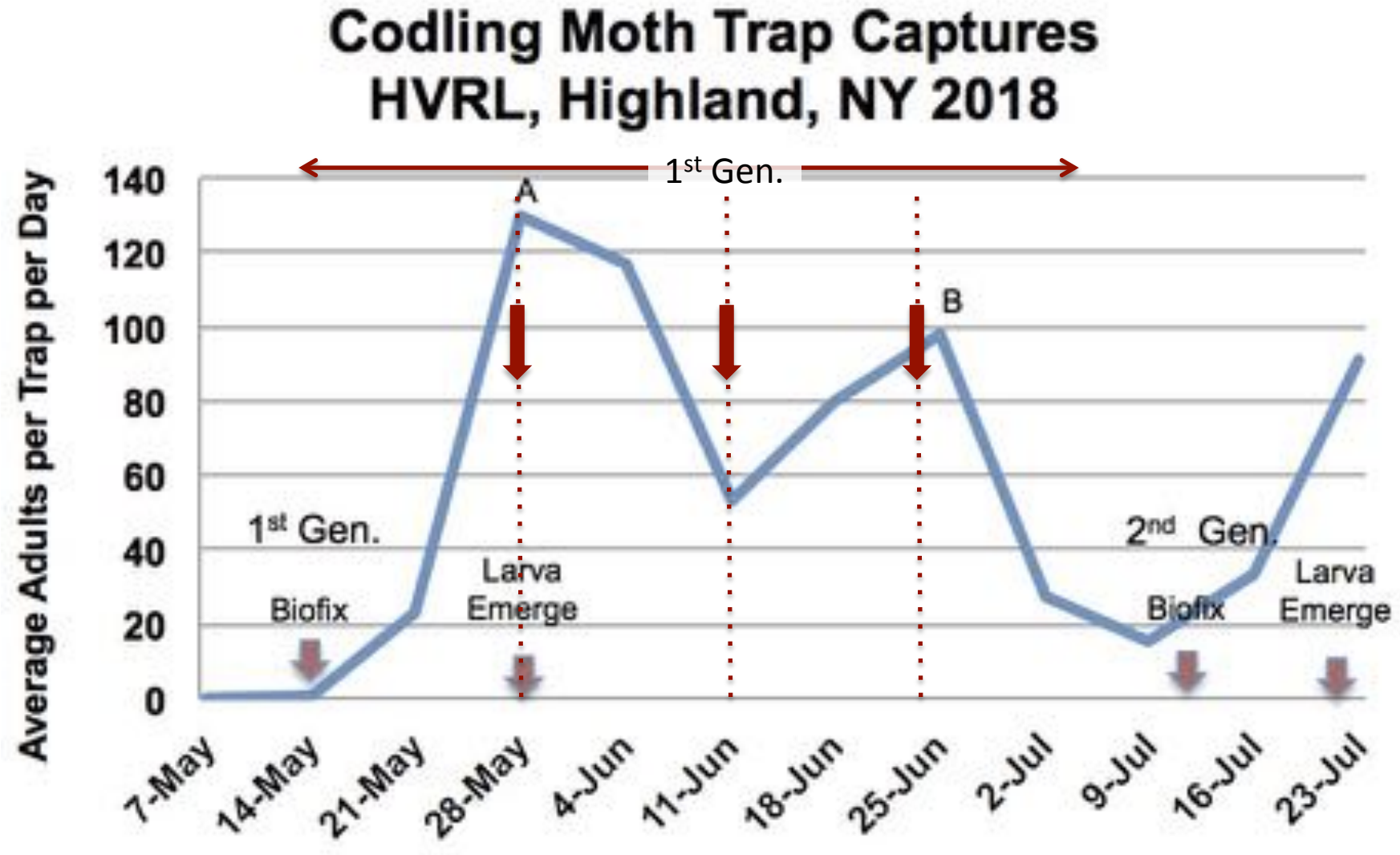
Tree Fruit Insect Complex



Tree Fruit Insect Complex



Codling Moth, Cydia pomonella (CM)



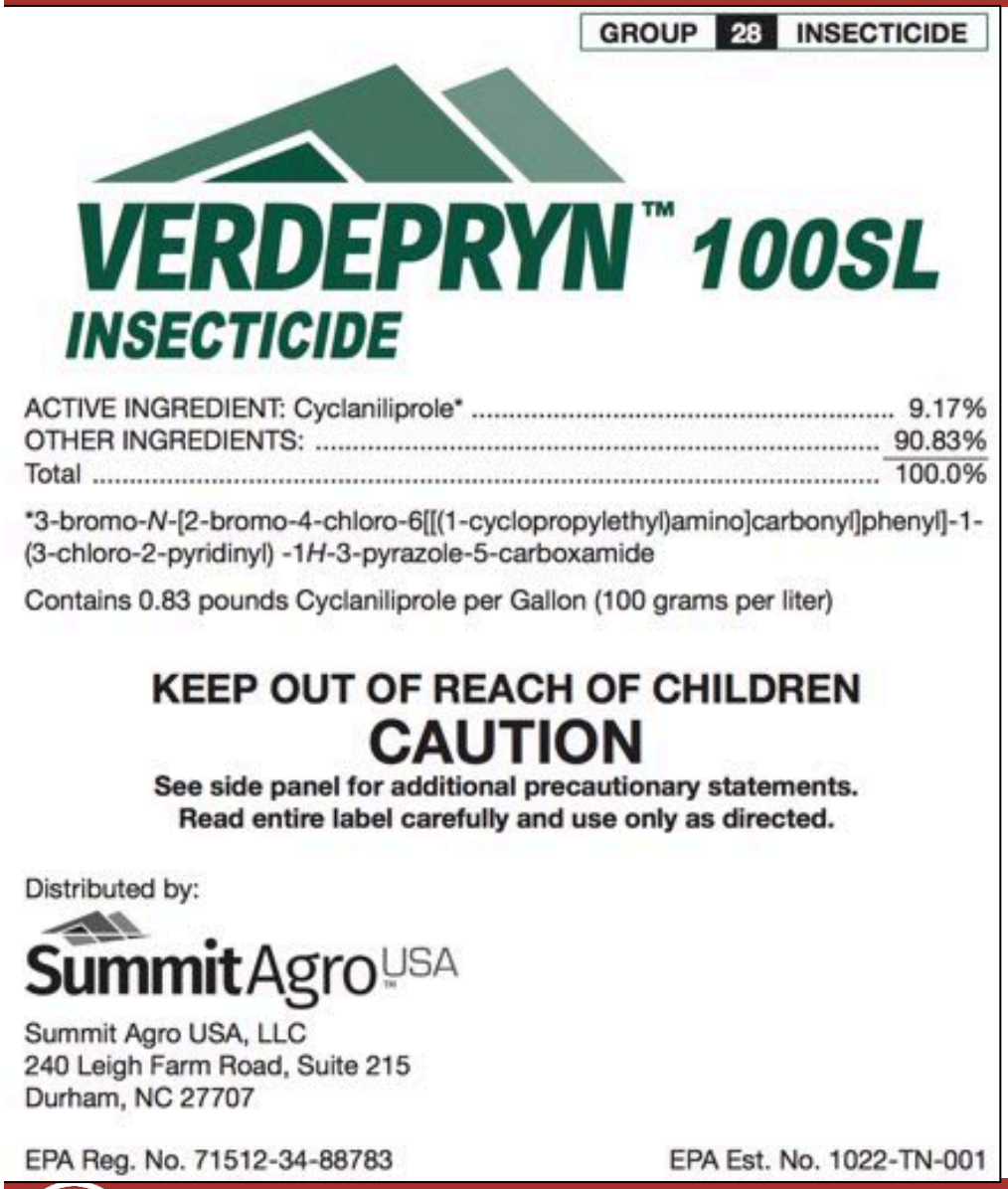
Apple insecticide precipitation wash-off re-application decision chart. Expected codling moth control in apples, based on each compound's inherent toxicity to codling moth larvae, maximum residual and wash-off potential from rainfall.

Insecticide Class	Insecticides	Rainfall = 0.5 inch		Rainfall = 1 inch		Rainfall = 2 inches	
		*1 day	*7 days	*1 day	*7 days	*1 day	*7 days
Organophosphate	Imidan	Sufficient insecticide residue	Insufficient insecticide residue	Sufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue
Pyrethroid	Asana	Sufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue
Neonicotinoid	Assail	Sufficient insecticide residue	Sufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue
Emmectin (IRAC 6)	Proclaim	Sufficient insecticide residue	Insufficient insecticide residue	Sufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue
IGR (IRAC 15)	Rimon	Sufficient insecticide residue	Sufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue
Spinosyns	Delegate	Sufficient insecticide residue	Sufficient insecticide residue	Sufficient insecticide residue	Sufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue
Diamides	Altacor	Sufficient insecticide residue	Sufficient insecticide residue	Sufficient insecticide residue	Sufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue

Insects Causing Significant Injury to Apple 2017-2018

- **Codling Moth, *Cydia pomonella* (CM)**
- **Black Stem Borer, *Xylosandrus germanus (BSB)***
- **San Jose Scale, *Quadraspidiotus perniciosus* (Comstock) (SJS)**
- **Wooly Apple Aphid, *Eriosoma lanigerum* (Hausmann) (WAA)**
- **Brown Marmorated Stink Bug & Complex, *Halyomorpha halys* (BMSB), (BSB, GSB)**

New Insecticides



GROUP 28 INSECTICIDE

VERDEPRYN™ 100SL

INSECTICIDE

ACTIVE INGREDIENT: Cyclaniliprole* 9.17%
OTHER INGREDIENTS: 90.83%
Total 100.0%

*3-bromo-*N*-[2-bromo-4-chloro-6[[(1-cyclopropylethyl)amino]carbonyl]phenyl]-1-(3-chloro-2-pyridinyl) -1*H*-3-pyrazole-5-carboxamide

Contains 0.83 pounds Cyclaniliprole per Gallon (100 grams per liter)

KEEP OUT OF REACH OF CHILDREN

CAUTION

See side panel for additional precautionary statements.
Read entire label carefully and use only as directed.

Distributed by:

SummitAgro USA

Summit Agro USA, LLC
240 Leigh Farm Road, Suite 215
Durham, NC 27707

EPA Reg. No. 71512-34-88783 EPA Est. No. 1022-TN-001

Diamide (Altacor, Exiril)

Pest Complex Management

- Plum Curculio
- European Apple Sawfly
- Leafhopper complex
- Lepidopteran Complex
  - Leafroller
  - Internal worm
  - European Corn Borer
  - Spotted Tentiform Leafminer

*Not for sale, sale into, distribution and/or use in Nassau and Suffolk Counties of New York State.

DIRECTIONS FOR USE

Crop	Insects	Use Rate Fl. Oz. Product Per Acre	Instructions
Pome Fruit (Crop Group 11-10)*	Codling moth Obliquebanded leafroller Green fruitworm Redbanded Leafroller Variegated leafroller Tufted apple budmoth Spotted tentiform leafminer Western tentiform leafminer White apple leafhopper European apple sawfly European corn borer Oriental Fruit moth Western flower thrips** Apple Maggot** Plum Curculio Pear psylla Stink bug spp.** **Suppression Only. Use in conjunction with an effective control program.	5.5 to 11.0 fl oz (0.036 to 0.072 lb. a.i. /A)	**Application Instructions:** Thorough coverage is essential to achieve best results. Select a spray volume appropriate for the size of trees and density of foliage. For best results apply 100-200 gallons water per acre. **Codling Moth:** Use the higher rates of 8.2 to 11 fl oz for heavy infestations. Make first application just prior to or at the beginning of egg hatch. Applications typically provide 10-14 days of protection. Use pheromone trap catches and local degree day based spray timing advisories to determine the development of each codling moth generation. For effective resistance management, make applications of VERDEPRYN 100SL INSECTICIDE in one codling moth generation before rotating to an insecticide with a different mode of action (Non- Group 28) in the next generation. **Obliquebanded Leafroller:** Apply in the pink to petal fall stage at first sign of feeding for overwintering larvae. For summer generation apply just prior to or at the beginning of egg hatch. **Pear Psylla:** For best results, apply to first generation nymphs using the high rate of 11 fl oz/A. Performance is enhanced when used with an effective adjuvant. **Plum Curculio** Apply at higher rates (8.2 to 11 fl oz/A) for best results. **Thrips:** Apply in the pink to petal fall stage at the first sign of active feeding. **Stink bugs**** VERDEPRYN 100SL INSECTICIDE provides suppression of stink bug **NYMPHS ONLY.** Use as a part of an Integrated Pest Management (IPM) program and target the most susceptible life stages and application timings. Use in conjunction with other modes of action and effective control products. Performance is enhanced when used with an effective adjuvant. For best results, use the high labeled rate when targeting stink bug nymphs.

*Includes all members of the Pome Crop Group Family: Apple; azarole; crabapple; loquat; mayhaw; medlar; pear; pear, Asian; quince; quince, Chinese; quince, Japanese; tejocote; cultivars, varieties, and/or hybrids of these.

Application fit:

- Max. Appl. 3 / season within a single generation @ 33 fl. oz. / yr.

Example: PF, 1-2C
Plum Curculio
1st Gen. Codling Moth

HARVANTA is sold exclusively through Helena Agri-Enterprises & Tenkoz Member Companies.

Plum Curculio *Conotrachelus nenuphar*

		% Damaged fruit				
Treatment	**Rate/acre**	**29 Apr**	**6 May**	**13 May**	**21 May**	**5 Jun**
Cyclaniliprole 4.6% EC	22.0 fl oz	4.5a	11.5a	10.0a	17.5a	13.0a
Imidan 70WP	3.5 lb	7.5a	18.0a	14.0a	14.5a	13.5a
Actara 25WDG	5.0 oz	5.0a	11.0a	15.5a	16.5a	16.5a
Check	—	30.0b	61.5b	46.0b	59.5b	33.3a

Means within a column followed by the same letter are not significantly different (LSD, $P \geq 0.05$).

Evaluation of Cyclaniliprole for Control of Plum Curculio on Apples, 2015 J. F. Walgenbach, NC State

Plum Curculio *Conotrachelus nenuphar*

Treatment/formulation	Rate amt product/acre	Mean #		Mean % fruit injury	
		Scars/fruit	Larvae/fruit	Feed	Egg scars
IKI-3106 50SL	22.0 oz	0.46b	1.8ab	4.0b	30.0b
IKI-3106 50SL	27.0 oz	0.41b	1.0ab	5.0ab	28.0b
Apta +	21.0 oz	0.86b	2.5 ab	7.0ab	42.0b
MSO	0.25%				
Asana XL	14.0 oz	0.56b	1.5ab	7.0ab	41.0b
Venerate	3.0 pts	2.84a	2.5ab	25.0a	93.0a
Actara 25WG	5.5 oz	0.37b	0.0b	3.0b	27.0b
UTC		3.51a	6.0a	17.0ab	91.0a

IKI-3106 50SL (cyclaniliprole), Diamide

Plum Curculio Control on Nectarine, 2015 Anne L. Nielsen, Ann Rucker

Brown Marmorated Stink Bug, *Halyomorpha halys*

Treatment/formulation	Rateamt/acre	% BMSB Mortality	
		Nymphs ($n = 20$)	Adults ($n = 20$)
Untreated check	n/a	10.0c	5.0b
IKI-3106 50SL	11.0	70.0b	30.0ab
IKI-3106 50SL	16.4	95.0a	45.0a
IKI-3106 50SL	22.0	100.0a	40.0a
Coragen 1.67 SC	5.0	25.0c	10.0b

Bioassay Evaluation of IKI-3106 (Cyclaniliprole) for Control of Brown Marmorated Stink Bug and Harlequin Bug, 2014. Thomas P. Kuhar, Virginia Tech,

Biological Insecticide

Control of Lepidopteran pests in fruits, vegetables and other high-value field crops.

Active Ingredient: GS-omega/kappa-Hxtx-Hv1a	2.0%
Other Ingredients:	98.0%
Total:	100.0%

KEEP OUT OF REACH OF CHILDREN

CAUTION

See back panel for Precautionary Statements, First Aid, and Storage and Disposal.

FIRST AID	
If in eyes	• Hold eye open and rinse slowly and gently with water for 15 – 20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
If on skin or clothing	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15 – 20 minutes. • Call a poison control center or doctor for treatment advice.

HOTLINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-535-5053 {and 1-352-323-3500 for International} for emergency medical treatment information.

Produced for:
Vestaron Corporation
600 Park Offices Drive, Suite 117
Research Triangle Park, NC 27709

EPA Reg. No.: 88847-6
EPA Est. No.: Printed on Container
Made in USA

VESTARON
THE POWER OF PEPTIDES™

- Peptide-based Bio-pesticide
- Labeled for pome and stone fruits
- To be tank mixed with a Bt product (Leprotec)

Crop	Insect Pest	Application Rate (Pint/acre)
Pome and Stone fruits **Such as:** Apples, Pears, Quince, Prunes, Apricots, Cherries, Nectarine, Peaches, Plums, Prunes **Nut Trees** **Such as:** Almonds, Filbert, Chestnuts, Walnuts, Pecans	Variegated leafroller Redbanded Leafroller Walnut Caterpillar Coding moth Cutworms Filbert Leafroller Oblique Banded Leafroller Cankerworms Fruitworms Winter moth (Apples only)	1.0 - 2.0
	Pandemis Leafroller European grapevine moth (crymax) Hickory shuckworm Citrus cutworm Navel Orangeworm Redhumped Caterpillar Tent Caterpillar Omnivorous leafroller Tortix Moth Peach twig borer Fruittree leafroller Gypsy moth Tufted Apple Budmoth Fall Webworm	

APPLICATION RATES FOR SPEAR - LEP + *BACILLUS THURINGIENSIS* IN A TANK MIX ON THE FOLLOWING CROPS

Pre-harvest Interval (PHI) = 0 days

LEPROTEC®

OPEN

FOR OUTDOOR FOOD, NON-FOOD, AND GREENHOUSE

AQUEOUS BIOLOGICAL INSECTICIDE

Active Ingredient: *Bacillus thuringiensis* ssp. *kurstaki* strain EVB-113-19 fermentation solids, spores, and insecticidal toxin.....14.49%*

Other Ingredients:.....85.51%

TOTAL:.....100.00%

*Potency: 17,500 Cabbage Looper Units (CLU) per mg of product (equivalent to 76 billion CLU per gallon of product) The percent active ingredient does not indicate product performance and potency measurements are not federally standardized.

KEEP OUT OF REACH OF CHILDREN

CAUTION

See back panel for additional first aid and precautionary statements.

FIRST AID	
If on skin or clothing	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
If in eyes	• Hold eye open, and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
HOTLINE NUMBER - Have the product container or label with you when calling a poison control center or doctor or when going for treatment. You may contact your local poison control center at 1-800-222-1222 for emergency and medical information. For information concerning this product, call the National Pesticide Information Center (NPIC) at 1-800-858-7378. Open from 8:00AM to 12:00PM Pacific Time, Mon-Fri.	

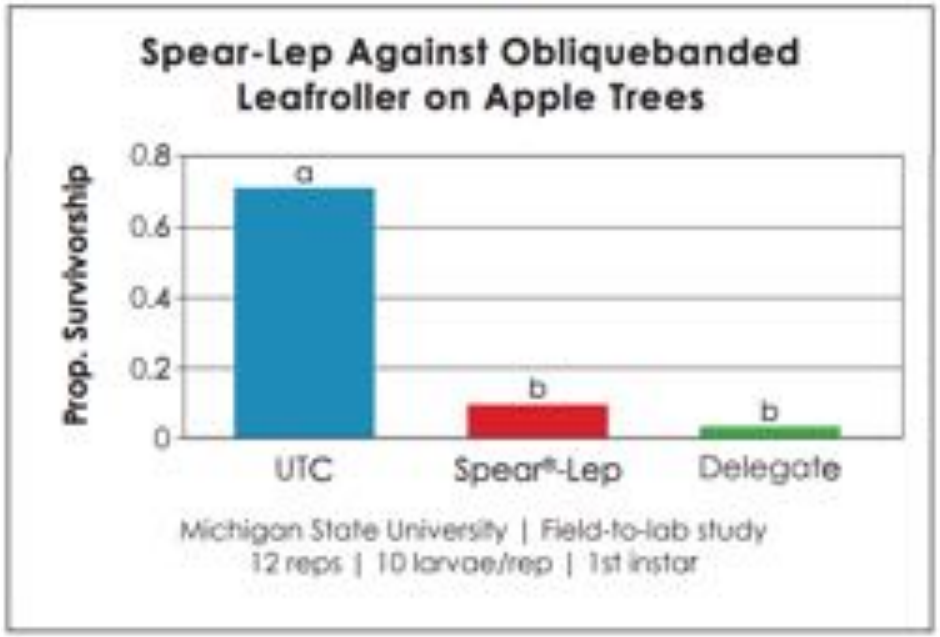
EPA Registration No.: 89046-12-88847
EPA Establishment No.: 89046-CAN-2
Use this product within 18 months of the date of manufacture.
Date of Manufacture: _____
Lot number: _____

Distributed by:
Vestaron Corporation
4717 Campus Drive
Kalamazoo, MI 49008

NET CONTENTS: 1 GALLON (128 FL OZ)

03/14/2019v1

VESTARON
THE POWER OF PEPTIDES™


Spear-Lep Against Obliquebanded Leafroller on Apple Trees
Prop. Survivorship
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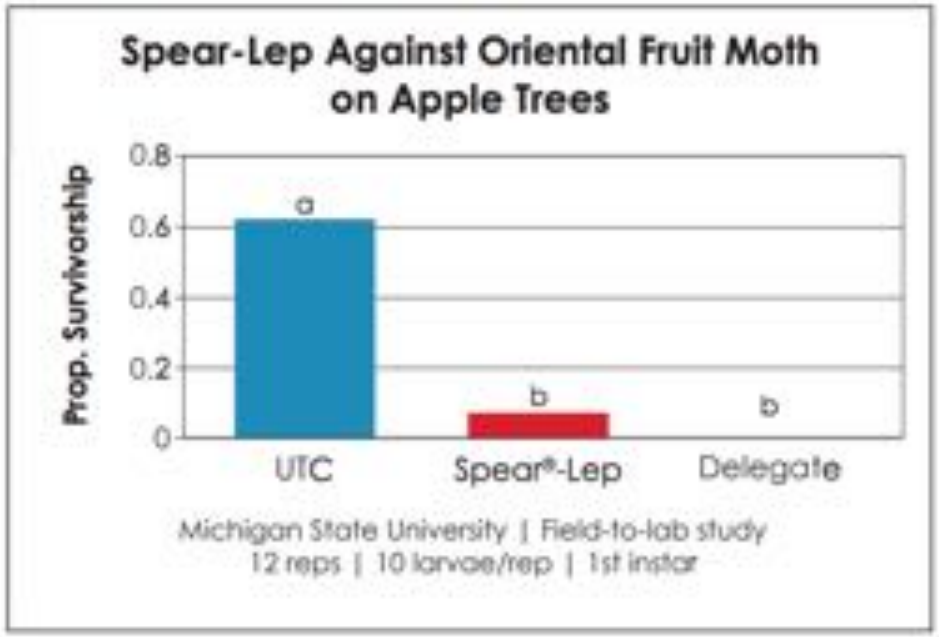
Michigan State University | Field-to-lab study
12 reps | 10 larvae/rep | 1st instar


Spear-Lep Against Oriental Fruit Moth on Apple Trees
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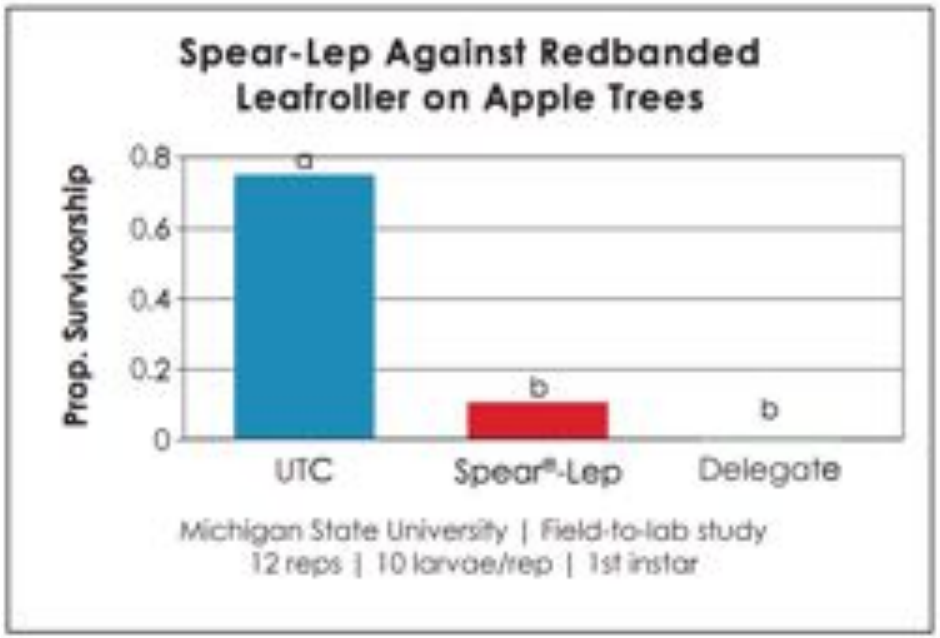
Michigan State University | Field-to-lab study
12 reps | 10 larvae/rep | 1st instar


Spear-Lep Against Redbanded Leafroller on Apple Trees
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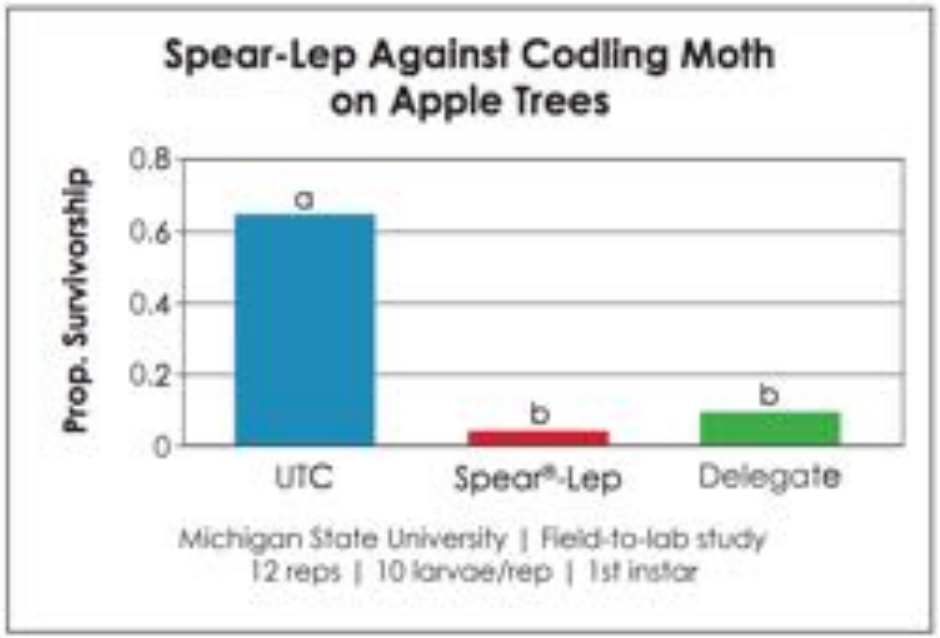
Michigan State University | Field-to-lab study
12 reps | 10 larvae/rep | 1st instar


Spear-Lep Against Codling Moth on Apple Trees
Prop. Survivorship
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UTC
Spear®-Lep
Delegate
Michigan State University | Field-to-lab study
12 reps | 10 larvae/rep | 1st instar

Treatment Schedule for Seasonal Apple Insecticide Screen
Hudson Valley Research Laboratory, Highland, NY - 2019

5.	Altacor 35 WG*	4.0 oz./A	PF, 1-8C	17 May, 3, 11, 24 June, 3, 23 July, 11, 20 Aug
	Actara*	4.0 oz./A	PF, 1C	17 May, 3 June
6.	Actara*	4.0 oz./A	PF, 1C	17 May, 3 June
	Spear-Lep*	32 fl.oz./A	1st gen CM	3, 11, 24 June, 3 July
	Leprotec*	16.0 fl.oz./A	1st gen CM	3, 11, 24 June, 3 July
	Exirel	20.5 fl.oz./A	2nd gen. CM	23 July 11, 20 Aug
7.	Actara*	4.0 oz./A	PF, 1C	17 May, 3 June
	Spear-Lep*	32.0 fl.oz./A	1st gen CM	3, 11, 24 June, 3 July
	Leprotec*	16.0 fl.oz./A	2nd gen CM	23 July 11, 20 Aug
8.	Actara*	4.0 oz./A	PF, 1C	17 May, 3 June
	Exirel	20.5 fl.oz./A	1st & 2nd gen CM	11, 24 June, 3, 23 July, 11, 20 Aug
	UTC			

* LI-700 @ 0.25% was added to spray solution throughout the season

Table 13a **Evaluations of Insecticides for Controlling Early Season Insect Complex on Apple [a]**
Hudson Valley Research Laboratory, Highland, NY - 2019

Trmt.	Formulation	Rate	Incidence (%) of insect damaged cluster fruit						
			PC	TPB	Int. LEP	Ext. LEP	EAS	SJS	Clean
5.	Altacor 35 WG*	4.0 oz./A	24.3	0.8	1.3 cd	4.5 bc	0.0	47.5	39.3 ab
	Actara	4.0 oz./A							
6.	Actara*	4.0 oz./A	24.6	1.0	10.5 bc	14.0 ab	0.0	6.0	45.2 ab
	Spear-Lep	32 fl.oz./A							
	Leprotec	16.0 fl.oz./A							
	Exirel	20.5 fl.oz./A							
7.	Actara*	4.0 oz./A	22.0	2.8	12.8 b	11.0 abc	0.3	6.3	51.5 ab
	Spear-Lep	32.0 fl.oz./A							
	Leprotec	16.0 fl.oz./A							
8.	Actara*	4.0 oz./A	18.9	2.3	2.8 bcd	2.3 bc	0.3	35.3	46.0 ab
	Exirel	20.5 fl.oz./A							
	UTC		36.6	0.8	47.3 a	25.7 a	0.3	19.2	6.1 b
P value for transformed data			0.2827	0.1960	0.0001	0.0001	0.9164	0.3697	0.0235

* Evaluation made on 'Ginger Gold' cultivar on 31 July. Applications specifically timed for emergence of SJS nymph and apple maggot. All insecticide calculations (presented as amt/A) are based on a standard dilution of 300 gal/A trees. Data were transformed using arcsine(sqrt(x)) prior to ANOVA ($P \leq 0.05$). Means separation by Tukey-Kramer HSD ($P \leq 0.05$); treatment means followed by the same letter are not significantly different. Arithmetic means reported. * LI-700 @ 0.25%.

Evaluations of Insecticides for Controlling Early Season Insect Complex on Apple [a]
Hudson Valley Research Laboratory, Highland, NY - 2019

	Trmt. / Formulation	Rate	Incidence (%) of insect damaged cluster fruit					
			Lf. Roller	CM	AMP	AMT	SB	Clean
5.	Altacor 35 WG*	4.0 oz./A	0.0 c	0.5 d	0.8 b	0.3 b	0.0	39.3 ab
	Actara	4.0 oz./A						
6.	Actara*	4.0 oz./A	2.0 abc	7.8 bc	4.5 ab	4.0 ab	0.5	45.2 ab
	Spear-Lep	32 fl.oz./A						
	Leprotec	16.0 fl.oz./A						
	Exirel	20.5 fl.oz./A						
7.	Actara*	4.0 oz./A	3.0 ab	9.5 bc	3.3 ab	2.0 ab	0.0	51.5 ab
	Spear-Lep	32.0 fl.oz./A						
	Leprotec	16.0 fl.oz./A						
8.	Actara*	4.0 oz./A	0.0 c	1.0 cd	0.3 b	0.3 b	0.8	46.0 ab
	Exirel	20.5 fl.oz./A						
	UTC		6.4 a	27.0 a	18.9 a	8.3 a	0.5	6.1 b
P value for transformed data			0.1746	0.0001	0.0038	0.0027	0.6205	0.0235

[a] Evaluation made on 'Ginger Gold' cultivar on 31 July. Applications specifically timed for emergence of SJS nymph and apple maggot. All insecticide calculations (presented as amt/A) are based on a standard dilution of 300 gal/A trees. Data were transformed using arcsine(sqrt(x)) prior to ANOVA ($P \leq 0.05$). Means separation by Tukey-Kramer HSD ($P \leq 0.05$); treatment means followed by the same letter are not significantly different. Arithmetic means reported. * LI-700 @ 0.25%.

Treatment Schedule for Seasonal Apple Insecticide Screen
Hudson Valley Research Laboratory, Highland, NY - 2019

Treatment/Formulation	Rate	Phenology / Timing	Application Dates
1. Compound A*	6.16 fl.oz./A	PF, 1-8C	17 May, 3, 11, 24 June, 3, 23 July, 11, 20 Aug
LI700	0.25%	PF, 1-8C	17 May, 3, 11, 24 June, 3, 23 July, 11, 20 Aug
Actara*	4.0 oz./A	PF, 1C	17 May, 3 June
2. Compound A *	8.21 fl.oz./A	PF, 1-8C	17 May, 3, 11, 24 June, 3, 23 July, 11, 20 Aug
LI700	0.25%	PF, 1-8C	17 May, 3, 11, 24 June, 3, 23 July, 11, 20 Aug
Actara*	4.0 oz./A	PF, 1C	17 May, 3 June
3. Compound B*	3.08 fl.oz./A	PF, 1-8C	17 May, 3, 11, 24 June, 3, 23 July, 11, 20 Aug
LI700	0.25%	PF, 1-8C	17 May, 3, 11, 24 June, 3, 23 July, 11, 20 Aug
Actara*	4.0 oz./A	PF, 1C	17 May, 3 June
4. Compound B*	4.11 fl.oz./A	PF, 1-8C	17 May, 3, 11, 24 June, 3, 23 July, 11, 20 Aug
LI700	0.25%	PF, 1-8C	17 May, 3, 11, 24 June, 3, 23 July, 11, 20 Aug
Actara*	4.0 oz./A	PF, 1C	17 May, 3 June
5. Altacor 35 WG*	4.0 oz./A	PF, 1-8C	17 May, 3, 11, 24 June, 3, 23 July, 11, 20 Aug
LI700	0.25%	PF, 1-8C	17 May, 3, 11, 24 June, 3, 23 July, 11, 20 Aug
Actara*	4.0 oz./A	PF, 1C	17 May, 3 June

* Evaluation made on 'Ginger Gold' cultivar on 31 July. Applications specifically timed for emergence of SJS nymph and apple maggot. All insecticide calculations (presented as amt/A) are based on a standard dilution of 300 gal/A trees. Data were transformed using arcsine(sqrt(x)) prior to ANOVA ($P \leq 0.05$). Means separation by Tukey-Kramer HSD ($P \leq 0.05$); treatment means followed by the same letter are not significantly different. Arithmetic means reported. * LI-700 @ 0.25%.

Table 10 **Evaluations of Insecticides for Controlling Early Season Insect Complex on Apple [a]**
Hudson Valley Research Laboratory, Highland, NY - 2019

Trmt. / Formulation	Rate	Incidence (%) of insect damaged cluster fruit							
		PC	TPB	Int. LEP	Ext. LEP	EAS	SJS	MPB	Clean
1. Compound A*	6.16 fl.oz./A	7.0 ab	1.5	0.5 c	4.0 ab	0.5	0.5	0.0 ab	86.5 abcde
Actara	4.0 oz./A								
2. Compound A *	8.21 fl.oz./A	10.0 ab	2.5	1.0 c	5.0 ab	0.0	1.5	0.0 ab	81.0 abcde
Actara	4.0 oz./A								
3. Compound B*	3.08 fl.oz./A	13.1 ab	2.5	0.0 c	0.5 b	0.0	0.0	0.0 ab	83.9 abcde
Actara	4.0 oz./A								
4. Compound B*	4.11 fl.oz./A	7.5 ab	1.5	1.0 c	2.0 ab	0.0	0.0	0.0 ab	88.0 abcd
Actara	4.0 oz./A								
5. Altacor 35 WG*	4.0 oz./A	8.5 ab	1.0	0.5 c	2.5 ab	0.0	3.0	0.0 ab	85.0 abcde
Actara	4.0 oz./A								
8. Actara*	4.0 oz./A	19.0 ab	1.0	3.0 c	3.5 ab	0.5	4.5	0.0 ab	70.5 bcde
Exirel	20.5 fl.oz./A								
UTC		32.0 c	3.3	22.7 d	6.7 ab	0.0	0.0	< 0.1 a	45.3 e
P value for transformed data		0.0044	0.8206	0.0001	0.0347	0.6952	0.2455	0.0044	0.0001

[a] Evaluation made on 'Ginger Gold' cultivar on 8th July. Applications specifically timed for emergence of SJS nymph and apple maggot. All insecticide calculations (presented as amt/A) are based on a standard dilution of 300 gal/A trees. All insecticide dilutions based on 300 GPA. Data were transformed using arcsine(sqrt(x)) prior to ANOVA (P ≤0.05). Means separation by Tukey-Kramer HSD (P ≤0.05); treatment means followed by the same letter are not significantly different. Arithmetic means reported. * LI-700 @ 0.25%.

Black Stem Borer, *Xylosandrus germanus*

- Black Stem Borer, 2mm in length, is a species of ambrosia beetle native to eastern Asia, but is an invasive species in Europe and North America.
- Females fly from woodlands to orchards, with **stressed trees that appear healthy and those that are dying.** They bore holes 1 mm in diameter into the wood of trunks or limbs to form reproductive galleries where it lays eggs and rears imature larva. It then carries an associated ambrosia fungus, *Ambrosiella hartigi and Fusarium solanii* into the galleries to feed its young.

- **Ethanol-baited traps mimic strssed trees that produce ethanol and are used to monitor female flight. Entry sites found in wood can be seen from early July through early August in NYS.**
- Upon infesting the tree, the mycelium growth that the insects feed on, signals the tree that it is under attack, walling off its vascular system in response, symptoms develop including wilting, dieback, tree decline and death.

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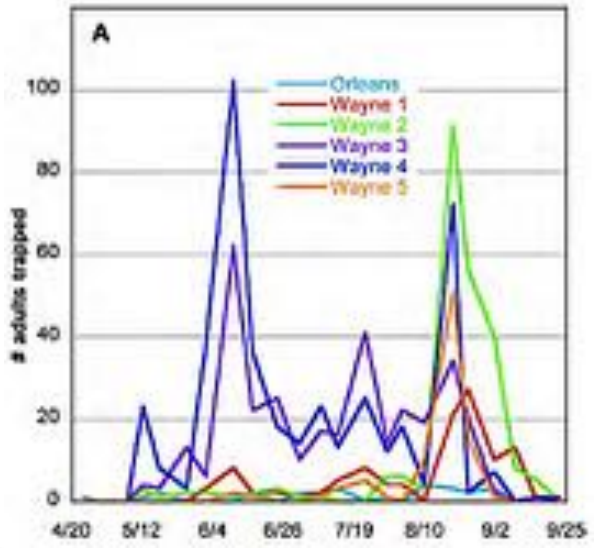
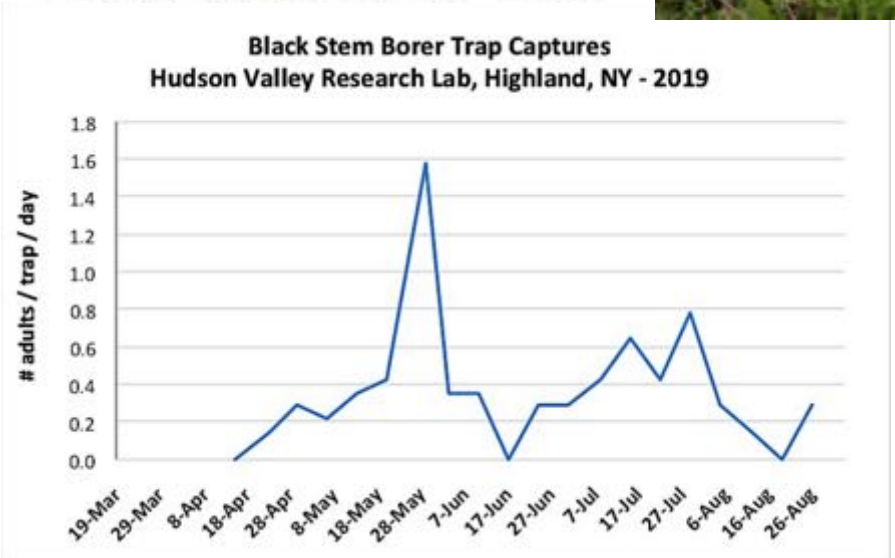
Black Stem Borer, *Xylosandrus germanus*





Monitoring flight

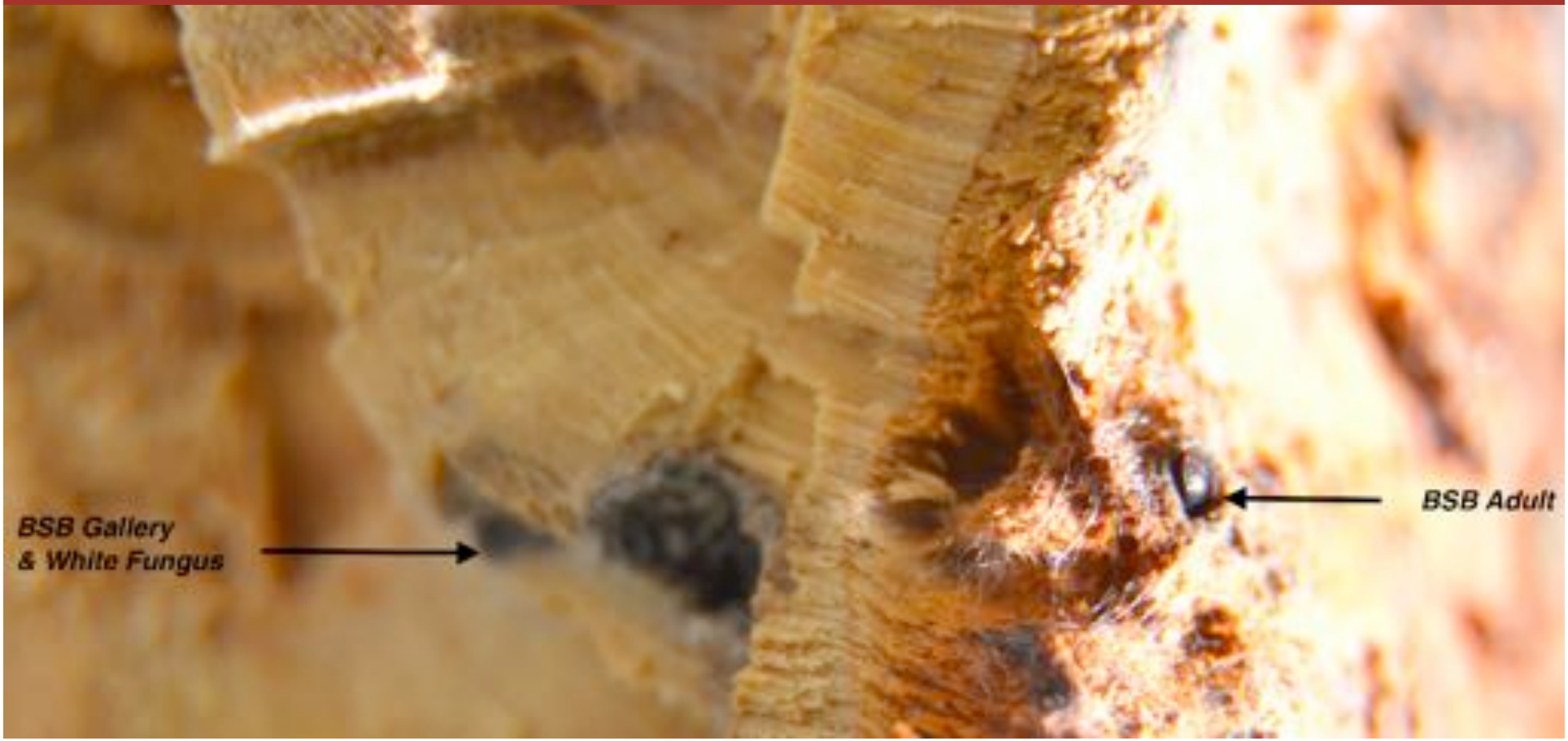
- AgBio ethanol lures
- Inverted ‘juice’ comtainer, cut openings for beetle entry
- Late April (Mid-Hudson Valley)

Monitoring boring activity

- Use Ethanol-treated wood or AgBio ethanol lures
- Monitor 9” x 1” Beech or maple bolts for shot holes

*Lorsban trunk application at first sign of boring

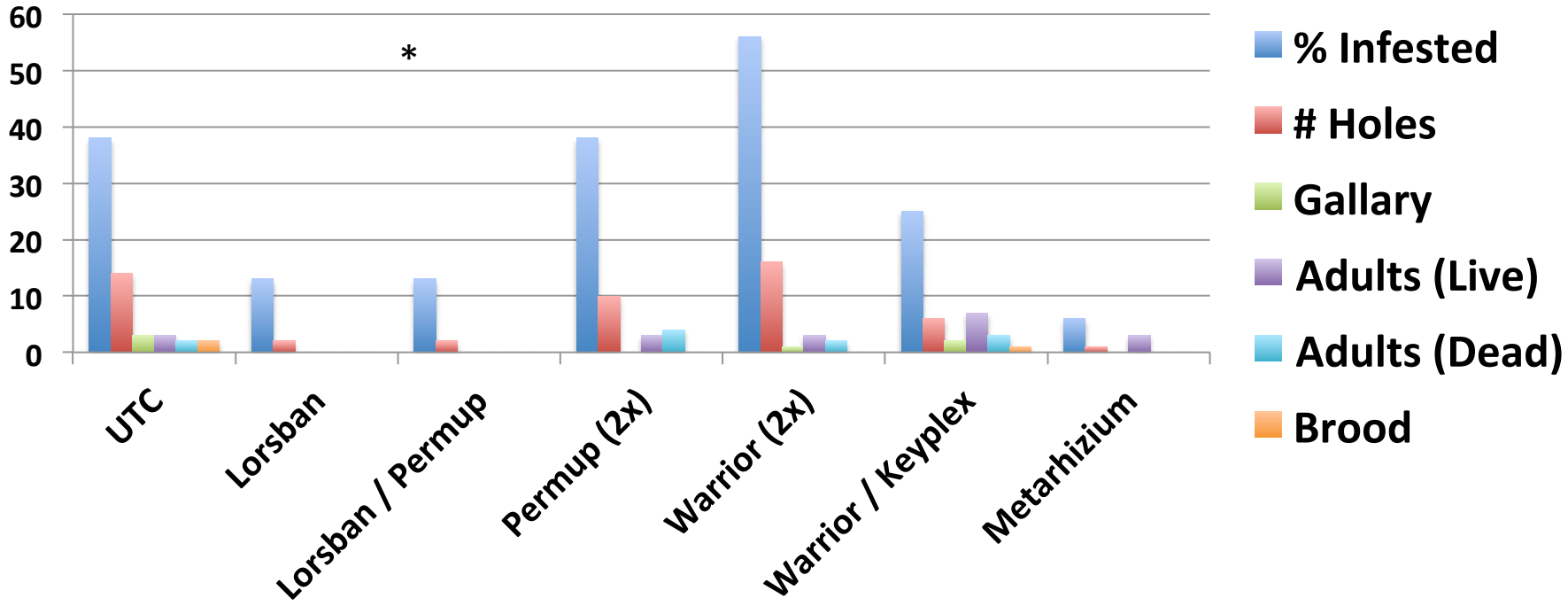
Black Stem Borer, *Xylosandrus germanus*



- Trees under drought or excessive water stress trees are susceptible to BSB burrowing
- Once inside the tree, insecticide applications are ineffective
- Directed trunk application are only effective prophylactically, primarily during early spring.

Black Stem Borer, *Xylosandrus germanus*

Nursery Trial for control of 1st generation BSB at Wafler - 2015 **A. Agnello**

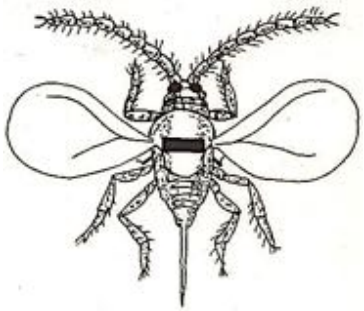


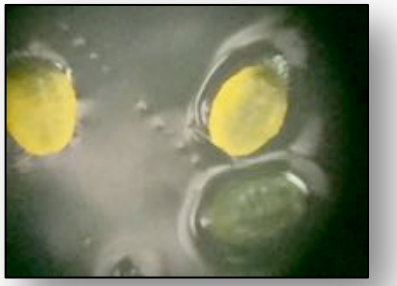
8 Trmts 4 replicates of sleeping eye M-9 trees. May 7th application using Solo sprayer.

Discussion:

- Lorsban was effective at reducing the pressure in the Wafler nursery site.
- The pyrethroids did not show promising control.
- Metarhizium, biological control fungus, appeared to be effective but severely burned trees

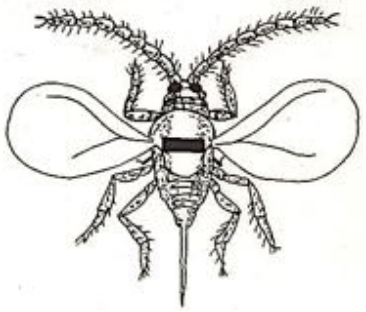
San Jose Scale
Quadraspidiotus perniciosus (Comstock) (SJS)

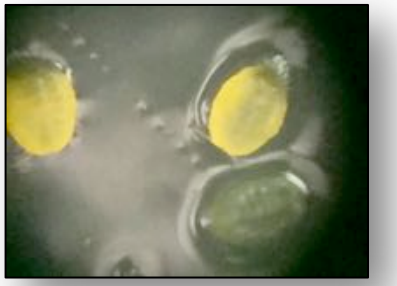




- **San Jose scale (SJS)** is an **endemic pest** of tree fruit.
- SJS bark infestations contribute to overall decline in tree vigor, growth, and productivity.
- Loss of broad-spectrum post PF tools & increased tolerance from yearly exposure contribute to recent outbreaks.
- Feeding on the fruit induces local **red to purple discoloration** around feeding sites to decrease the cosmetic quality of the crop.
- **SJS produce 2 generations.** Crawlers are produced continuously over the season, fruit infestations are a constant threat once crawlers begin to emerge.
- Crawlers emerge from beneath the female scale cover, crawl or are **air-borne to new sites** of infestation on the bark, fruit, and leaves.
- **Develop waxy covering** within 48 hours of emergence (whitecap) that transitions to blackcap phase for 2nd gen. or overwintering.

San Jose Scale
Quadraspidiotus perniciosus (Comstock) (SJS)





SJS Injury

SJS Crawler Modeling:

- Pheromone trap for **adult male monitoring**.
- Black electrical tape with Vaseline to detect **first crawlers**

Model uses a 51°F lower threshold and 90°F upper threshold with 400 DD accumulations after the beginning of the male flight.

SJS Phenology	2018	2019
Male Flight	19_May	20_May
Crawler Emergence	16_Jun	17_Jun
First Fruit Injury	26_Jun	28_Jul

San Jose Scale
Quadraspidiotus perniciosus (Comstock) (SJS)

Pre-bloom Management Options

IRAC	Product	Rates	PHI (days)	REI (hrs)	Efficacy
	Venerate XC	2.0–4.0 qt / acre	0	4	Moderate
	Horticultural oil	2 gal/100 gal water plus	0	4	High
1B	Lorsban 4E	1.5–4 pts / acre	PB / 28 (A)	96	High
		1 pt/100 gal water			
1B	Lorsban 75WG	2.0–2.67 lb / acre	PB / 28 (A)	96	High
		0.3-0.67 lb/100 gal water			
4D	Sivanto Prime	10.5–14.0 fl oz / acre	14	4	Moderate
16	Centaur 0.7WDG	34.5 oz / acre	14	12	High
	Horticultural oil	2 gal/100 gal water plus			
7C	Esteem 35WP	4–5 oz / acre	45	12	High

San Jose Scale
Efficacy Screening Study, HVRL 2017

Treatment/Formulation	Rate	Timing	Application Dates
1. Sivanto	10.5 oz./A	P	24 April
Danitol 2.4 EC	16.0 oz./A	PF	8 May
2. Sivanto	14.0 oz./A	P	24 April
Danitol 2.4 EC	16.0 oz./A	PF	8 May
3. Sivanto	10.5 oz./A	P, 1C	24 April, 18 May
Danitol 2.4 EC	16.0 oz./A	PF	8 May
4. Sivanto	10.5 oz./A	P	24 April
Danitol 2.4 EC	16.0 oz./A	PF	8 May
Movento + LI700	9.0 oz./A	1C	18 May
5. Danitol 2.4 EC	16.0 oz./A	PF	8 May
Movento + LI700	9.0 oz./A	1C	18 May
6. Lorsban 4 EC	1.0 pt./100 gal.	P	24 April
Danitol 2.4 EC	16.0 oz./A	PF	8 May
Altacor	4.0 oz./A	SJS Emg. + 14 d.	15 June, 29 June
7. Danitol 2.4 EC	16.0 oz./A	PF	8 May
Venerate XC	2.0 qt./A	SJS Emg. + 14d.	15 June, 29 June
8. Danitol 2.4 EC	16.0 oz./A	PF	8 May
Grandevo WDG	2.0 lb./A	SJS Emg. + 14d.	15 June, 29 June
9. Exirel	20.5 fl. oz./A	P, PF, 1C	24 April, 8 & 18 May
		SJS Emg. + 14d.	15 June, 29 June
10. Untreated Check (UTC)			

San Jose Scale
Efficacy Screening Study, HVRL 2017

Table 2 **Evaluations of Insecticides for Controlling Early Season Insect Complex on Apple [a]**
Hudson Valley Research Laboratory, Highland, NY - 2017

			Incidence (%) of insect damaged cluster fruit							
Trmt. / Formulation		Rate	PC	TPB	EAS	MPB	E. LEP	CM	SJS	Clean
1.	Sivanto Danitol 2.4EC	10.5 oz./A 16.0 oz./A	10.9 a	0.9 ab	0.9 a	0.0	1.3 abc	3.0 ab	22.5 ab	62.3 ab
2.	Sivanto Danitol 2.4EC	14.0 oz./A 16.0 oz./A	15.5 ab	1.0 ab	0.8 a	0.0	2.4 abc	5.1 b	7.5 ab	69.7 ab
3.	Sivanto Danitol 2.4EC	10.5 oz./A 16.0 oz./A	14.5 a	0.8 a	0.5 a	0.0	0.0 a	3.8 ab	40.0 b	47.5 ab
4.	Sivanto Danitol 2.4EC Movento + LI700	10.5 oz./A 16.0 oz./A 9.0 oz./A	18.5 ab	2.8 ab	0.5 a	0.0	2.3 abc	1.5 ab	2.3 a	74.2 b
5.	Danitol 2.4EC Movento + LI700	16.0 oz./A 9.0 oz./A	9.9 a	1.2 ab	0.9 a	0.0	0.3 ab	1.0 ab	0.0 a	64.9 ab
6.	Lorsban 4EC Danitol 2.4EC Altacor	1.0 pt./100 16.0 oz./A 4.0 oz./A	14.8 ab	1.5 ab	0.8 a	0.0	2.0 abc	0.0 a	5.3 ab	76.8 b
7.	Danitol 2.4EC Venerate XC	16.0 oz./A 2.0 qts./A	11.0 a	2.8 ab	2.0 a	0.0	4.0 c	3.5 ab	3.8 ab	75.3 b
8.	Danitol 2.4EC Grandevo WDG	16.0 oz./A 2.0 lbs./A	37.5 ab	1.1 a	0.3 a	0.0	3.8 bc	3.5 ab	1.8 a	51.4 ab
9.	Exirel	20.5 fl.oz./A	18.7 ab	1.5 ab	0.3 a	0.0	1.5 abc	0.3 ab	21.9 ab	59.6 ab
10.	UTC		47.3 b	4.0 b	0.4 a	0.0	3.4 bc	2.0 ab	30.0 ab	24.9 a
P value for transformed data			0.2741	0.5015	0.779	-	0.1631	0.273	0.3186	0.433

[a] Evaluation made on 16 June on 'Red Delicious' cultivar.

San Jose Scale
Efficacy Screening Study, HVRL 2019

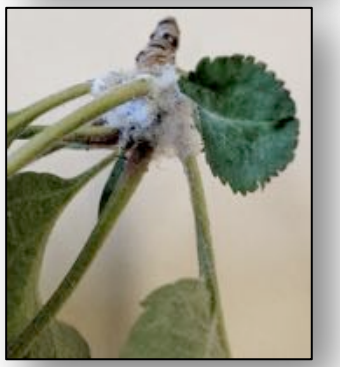
Treatment/Formulation		RateTiming	Application Timing	Dates
1.	Actara	4.0 oz./A	PF, 1C	17 May, 3 June
	Sivanto Prime	14.0 oz./A	Pink	23 April
	Movento*	9.0 oz./A	1C	3 June
2.	Actara	4.0 oz./A	PF, 1C	17 May, 3 June
	Sivanto HL*	7.0 oz./A	Pink	23 April
	Movento*	9.0 oz./A	1C	3 June
3.	Actara	4.0 oz./A	PF, 1C	17 May, 3 June
	Movento*	9.0 oz./A	1C	3 June
4.	Lorsban	4.0 pts./A	Pink	17 April
	Actara	4.0 oz./A	PF	17 May
	Imidan 70WP	3.0 lb./A	1C, 1st & 2nd SJS Emg.	
5.	Actara	4.0 oz./A	PF, 1C	17 May, 3 June
	Venerate XC**	4.0 qt./A	DD (1/4"G)	10 April,
6.	Actara	4.0 oz./A	PF, 1C	17 May, 3 June
	Venerate XC**	2.0 qt./A	1st gen SJS Emg. (1 app)	
	Venerate XC**	2.0 qt./A	2nd gen SJS Emg. (1 app)	
7.	Actara	4.0 oz./A	PF, 1C	17 May, 3 June
	Venerate XC**	1.0 qt./A	1st gen SJS Emg. (1 app)	
	Venerate XC**	1.0 qt./A	2nd gen SJS Emg. (1 app)	
8.	UTC			

San Jose Scale
Efficacy Screening Study, HVRL 2019

Trmt. / Formulation	Rate	Incidence (%) of insect damaged fruit			
		SJS	Clean	SJS	Clean
1. Sivanto Prime Movento® + LI700	14.0 oz./A 9.0 oz./A 32.0 oz./100	13.0 ab	13.5	17.5	11.5 a
2. Sivanto HL® Movento®	7.0 oz./A 9.0 oz./A	1.6 ab	26.6	4.0	20.7 a
3. Movento®	9.0 oz./A	0.3 b	26.5	6.4	17.1 a
4. Lorsban Imidan 70WP	4.0 pts./A 3.0 lb./A	12.4 ab	25.6	14.4	21.3 a
5. Venerate XC**	4.0 qt./A	24.4 a	15.0	12.4	18.4 a
6. Venerate XC**	2.0 qt./A	10.6 ab	20.0	18.0	19.7 a
7. Venerate XC**	1.0 qt./A	15.3 ab	25.0	30.3	19.8 a
8. UTC		19.2 ab	6.1	32.2	3.8 a

[a] Evaluation made on 'Ginger Gold' cultivar on 31 July. 'Red Delicious' cultivar on 5th Sept.

Wooly Apple Aphid (WAA), *Eriosoma lanigerum* (Hausmann)



Pest: Wooly Apple Aphid (WAA) is native to North America and occurs in most apple-growing areas of the world and a sporadic pest in orchards in the northeastern United States

Damage: Cover fruit and limbs with honey dew and sooty mold and galls on the plant parts, , excreting white filament waxy secretions for protection.

Failure to control aerial infestations can result in **underground infestations** on susceptible rootstocks (M.26 & M.9), **causing galls** & transmission of **perennial apple canker**, *Pezicula malicorticis* Jacks .

Biology: WAA aerial colonies feed mainly on apple, pear, quince, mountain ash, hawthorn, and Cottoneaster, on current season's growth, water sprouts, unhealed pruning wounds, or cankers.

Reproduction is asexual (parthenogenetic: mating is not required) as wingless female producing live young in aerial colonies or sexual, producing males, found to occur in Elm trees near fruit hosts.

Wooly Apple Aphid (WAA)
E. Beers, TFREC, Washington State - 2017

		WAA/colony		
		Pre-Treatment	2 DAT	7 DAT
Treatment/formulation	Rate/100 gal	28 Sep	4 Oct	9 Oct
Diazinon 50W	4 lb	36.50a	2.00c	0.33c
Venerate XC +	2 qt	36.58a	26.92ab	19.92ab
Bond Max	12 fl oz			
Venerate XC +	2 qt	35.50a	32.33a	22.67ab
NWW Supreme Oil	1% v:v			
NWW Supreme Oil	1% v:v	37.83a	8.33bc	6.08bc
Check	-	35.08a	30.83a	31.25a

Means within the same column followed by the same letter are not significantly different (P≤0.05)

- WAA frequencies are increasing, with the likely cause being materials used against the CM.
- Treatments were applied to the point of drip on 2 Oct using a backpack sprayer
- Aphid densities were evaluated at 2 and 7 DAT.
- Diazinon 50W excellent rescue tool for WAA.

Wooly Apple Aphid

A. Agnello, D. David Combes. NYSAES-Geneva - 2017

Treatment/formulation	Rate amt/acre	Timing	Application Dates
Closer 5SC+	5.75 oz	15% infestation + 14d	27 Jun, 12 Jul
LI-700	32.0 oz		
Closer 5SC+	5.75 oz	15% infestation + 14d	27 Jun, 12 Jul
Dyne-amic	48.0 oz		
Movento 240 SC+	9.0 oz	Approximately 1st Cover	12 Jun
LI-700	32.0 oz		
Movento 240 SC+	9.0 oz	Approximately 1st Cover	4 Jun
LI-700	32.0 oz		
Sivanto	14.0 oz	First appearance of WAA	24 Jun
LI-700	32.0 oz		
Untreated Check			

Dow AgroSciences: Closer 5 SC	(sulfloxaflor)	Anitfeedent
Bayer Crop Science: Movento 240 SC	(spirotetramat)	Systemic toxicant
Bayer Crop Science: Sivanto	(flupyradifurone)	Translaminar: acropetallyto xylem
		Surface toxicant

Wooly Apple Aphid

A. Agnello, D. David Combes. NYSAES-Geneva - 2017

*Aphelinus mali

Treatment/formulation	Rate amt/acre	% WAA Infested Terminals								
		11 Jun	22 Jun	29 Jun	3 Jul	10 Jul	17 Jul	26 Jul	1 Aug	7 Aug
Closer 5SC+ LI-700	5.75 oz 32.0 oz	0.0 a	17.0 ab	52.7 a	5.7 b	7.3 b	0.0 a	0.0 a	0.7 a	0.3 a
Closer 5SC+ Dyne-Amic	5.75 oz 48.0 oz	0.0 a	29.3 a	60.7 a	10.7 b	10.7 b	0.0 a	0.0 a	0.3 a	0.7 a
Movento 240 SC+ LI-700	9.0 oz 32.0 oz	0.0 a	16.3 ab	44.0 ab	14.7 b	11.0 b	0.0 a	0.0 a	1.3 a	0.0 a
Movento 240 SC+ LI-700 Sivanto+ LI-700	9.0 oz 32.0 oz 14.0 oz 32.0 oz	0.0 a	8.3 b	41.3 ab	10.7 b	10.0 b	0.0 a	0.0 a	1.7 a	1.0 a
Untreated Check		0.0 a	15.7 ab	15.7 b	40.7 a	31.0 a	0.0 a	0.3 a	2.0 a	2.3 a

Means within a column followed by the same letter are not significantly different (Student's t Test, $P \leq 0.05$).

Agnello Lab: http://blogs.cornell.edu/agnello/insecticide-efficacy-trials-2/

https://cpb-us-e1.wpmucdn.com/blogs.cornell.edu/dist/1/3910/files/2016/10/WAA-2017-report-1irkrya.pdf

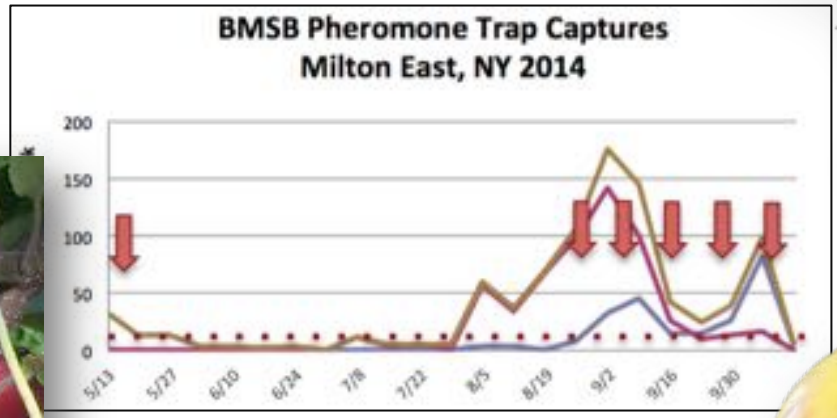
2018 Insect Pest Management Updates: Efficacy Screening & Invasive Insect Studies

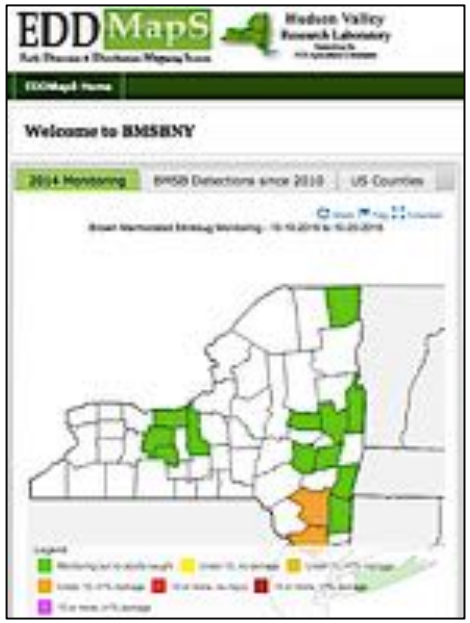
New & Old Insecticide Updates

Tree Fruit Insecticide Efficacy Studies

Invasive Insect Pest Complex Studies

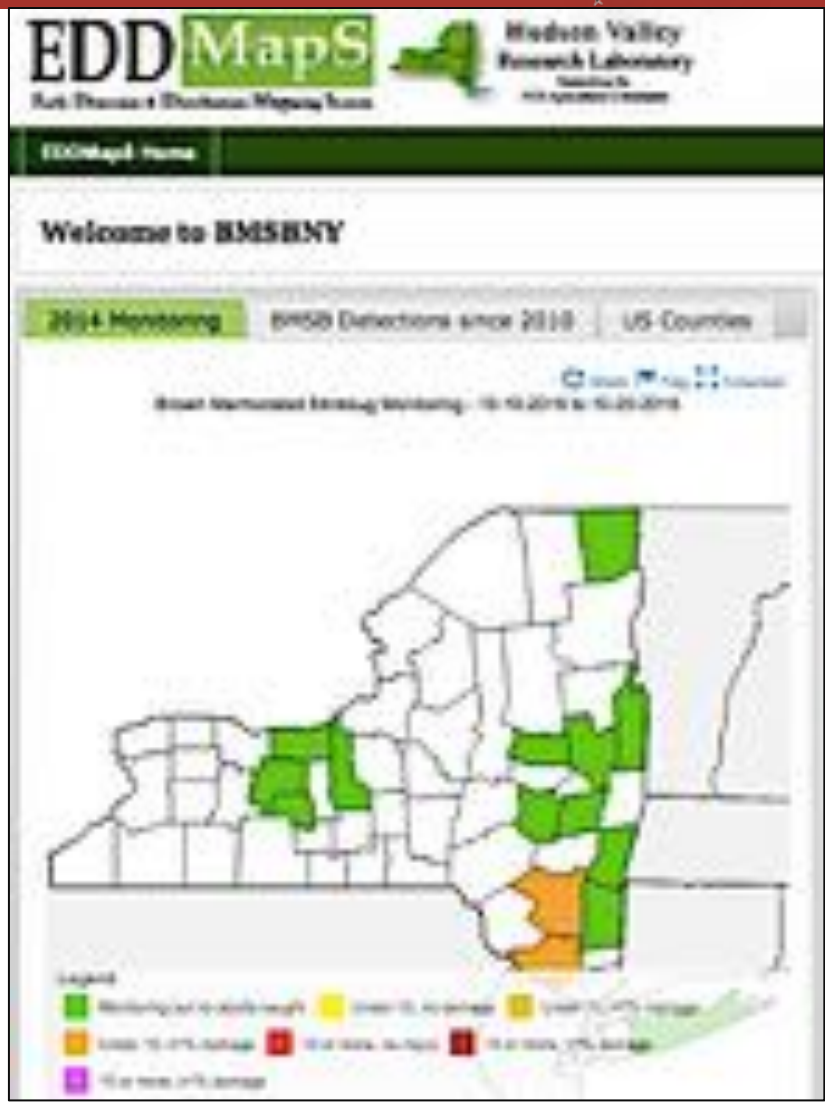
Monitoring and Management of the Stink Bug Complex





Brown Marmorated Stink Bug (BMSB)

- Seasonal presence of BMSB in your county



Brown Marmorated Stink Bug (BMSB)

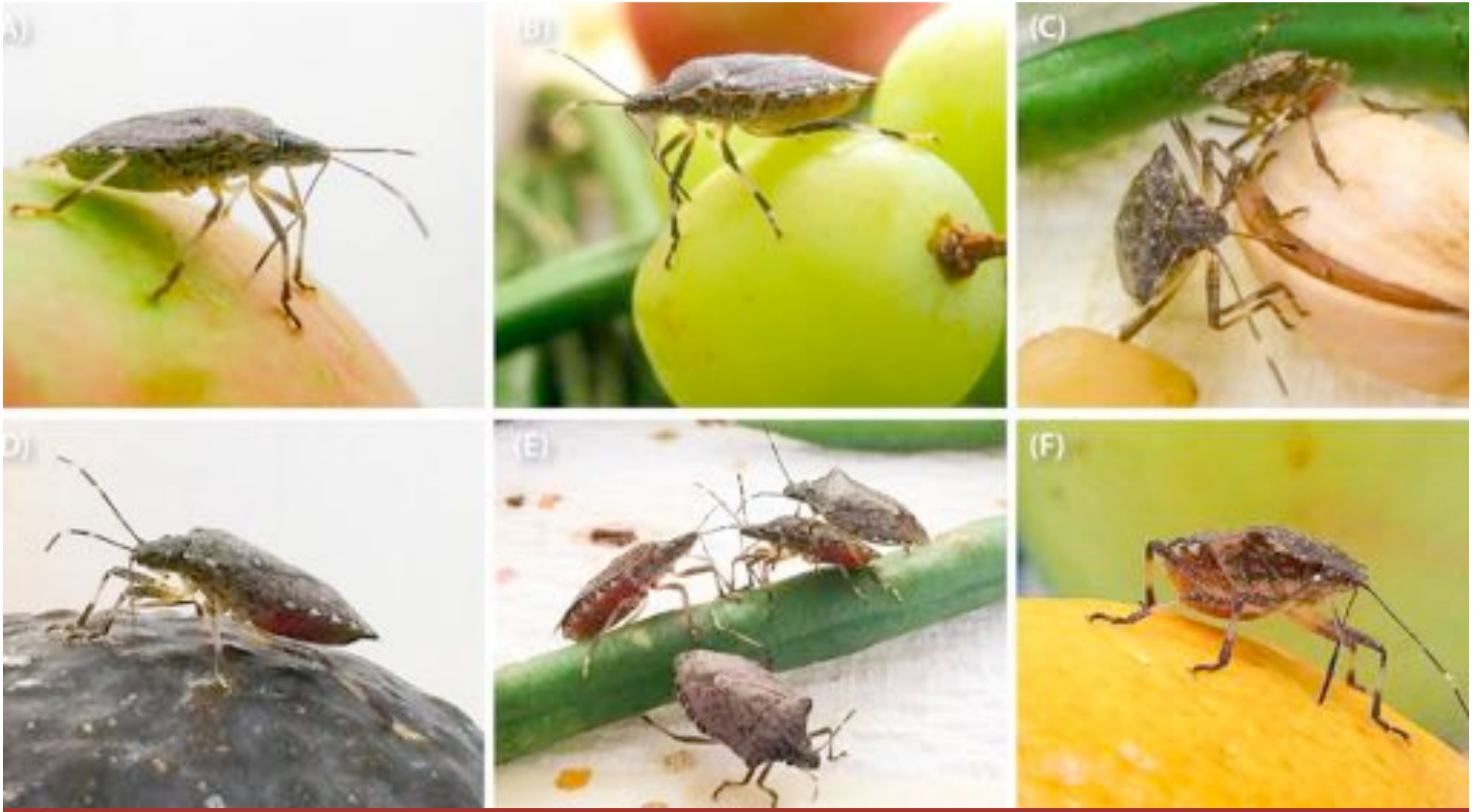
- Seasonal presence of BMSB in your county

- Tedders traps placed along the orchard edge near woodlands (2-4/farm or ≥50A orchard).

Brown Marmorated Stink Bug (BMSB)

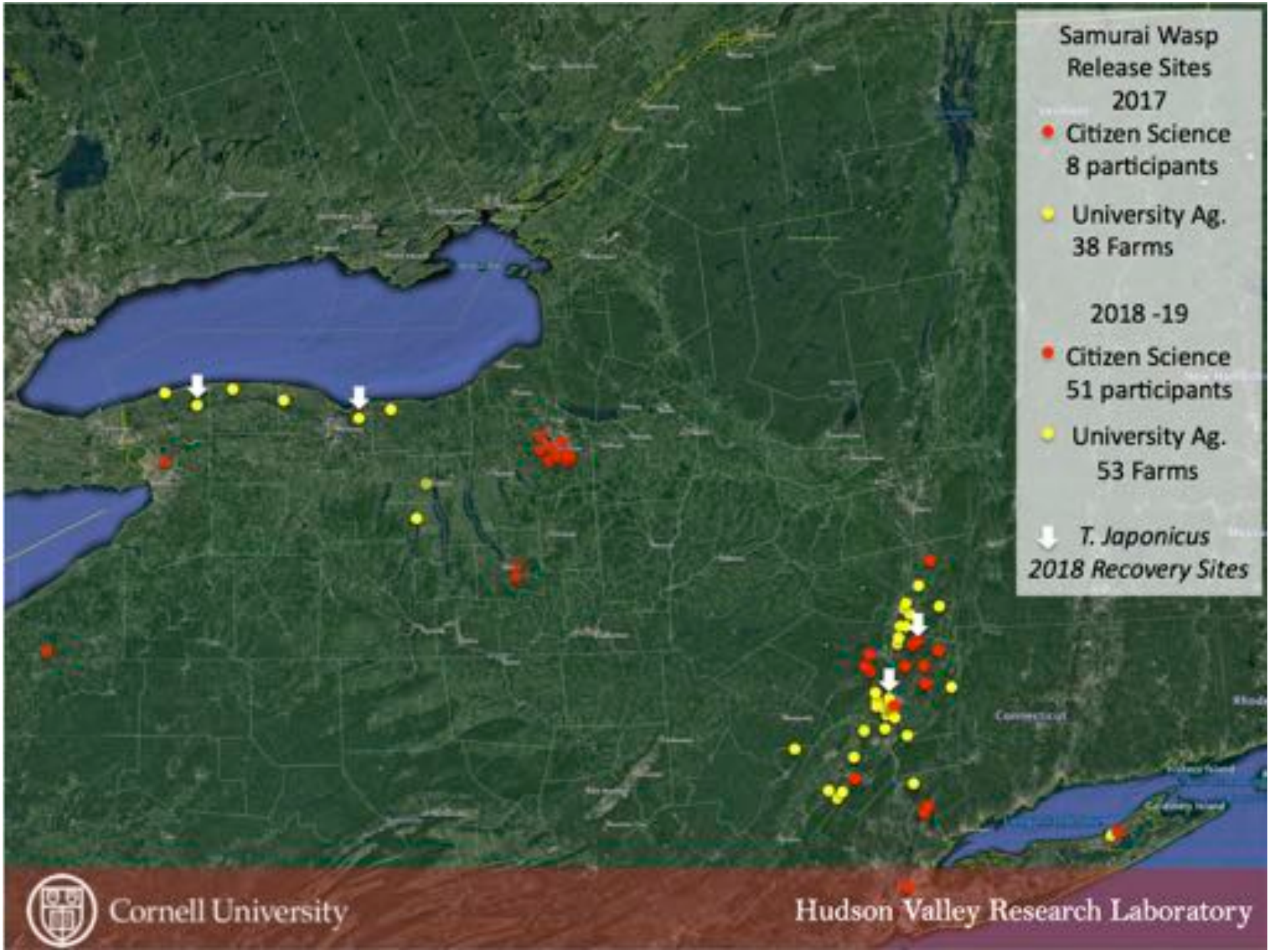
- Seasonal presence of BMSB in your county
- Tedders traps placed along the orchard edge near woodlands (4/farm or ≥50A orchard).
- If 10 adults/trap are found, scout orchard perimeter and interior. Use 1 SB per 100’ of row as action threshold.

BMSB: Residual Efficacy
Feeding Sheath & Limited Abdominal Contact with Fruit

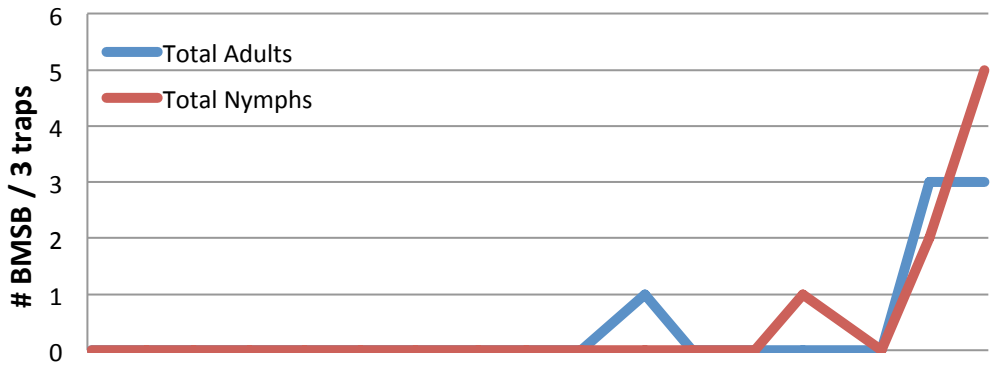


Update on Research Studies on Brown Marmorated Stink Bug, *Halyomorpha halys* Stål (Hemiptera: Pentatomidae) in NYS

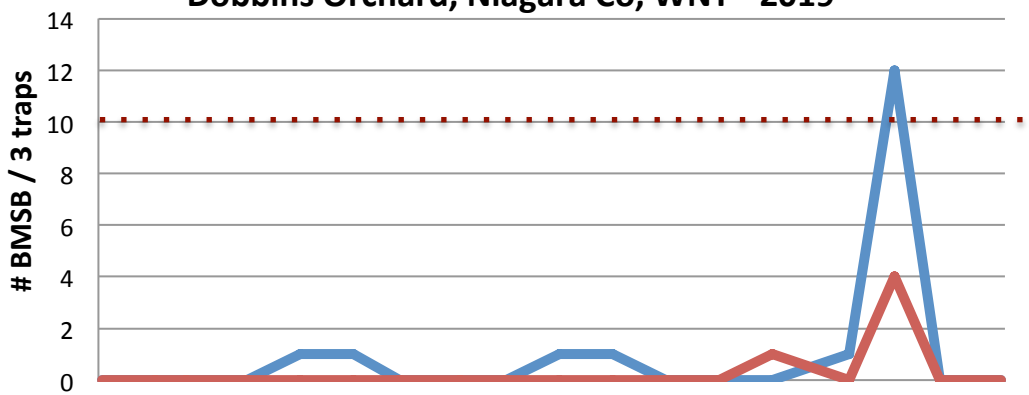
- Populations of BMSB were higher in 2019 than in recent years
- Fall urban infestations increased (Citizen Science respondents)
- All pheromone trap monitoring sites for BMSB had captures
- WNY trap site exceeded thresholds (10 adults/trap) in 5 of 6 sites by mid-Sept.
- ENY trap sites exceeded thresholds beginning 16 Aug. – 13 Sept.
- Marlboro site (First find of *T. japonicus 2016)* exceeded threshold beginning 16 Aug. with 160 BMSB/wk by 30 Sept.
- To date, *T. japonicus* has been redistributed to 104 sites in NYS.
- 2019 ID of *T. japonicus* from Alpha Scents YS cards in process


Samurai Wasp
Release Sites
2017
Citizen Science
8 participants
University Ag.
38 Farms
2018 -19
Citizen Science
51 participants
University Ag.
53 Farms
T. Japonicus
2018 Recovery Sites
Cornell University
Hudson Valley Research Laboratory

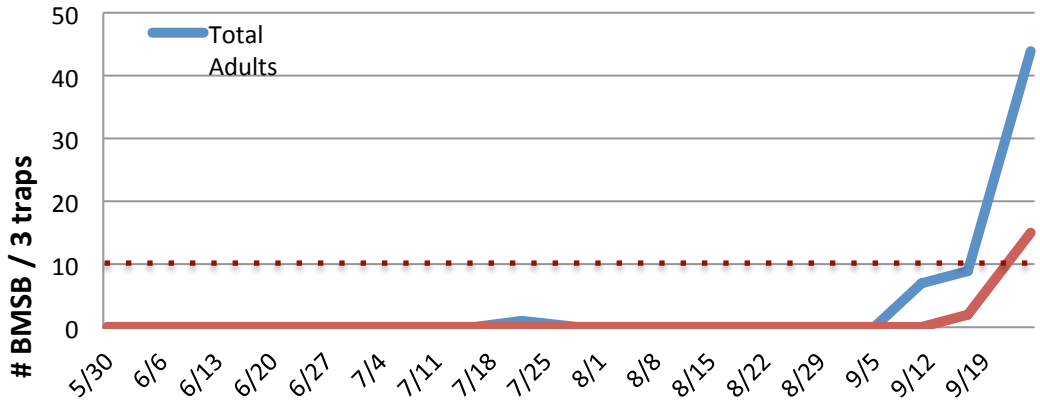
BMSB Pheromone Trap Capture
Burch Orchard, Niagara Co, WNY - 2019



Dobbins Orchard, Niagara Co, WNY - 2019



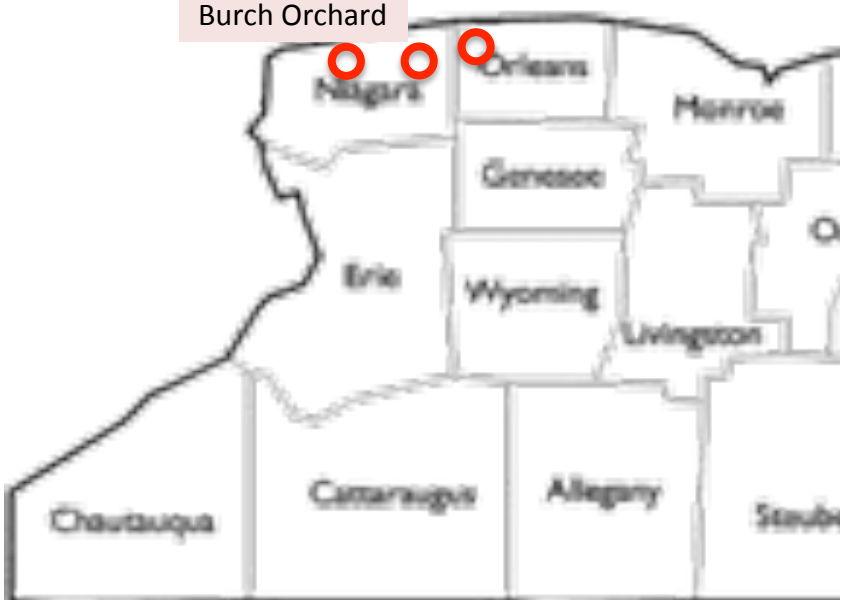
Oaks Orchard, Orleans Co, WNY - 2019



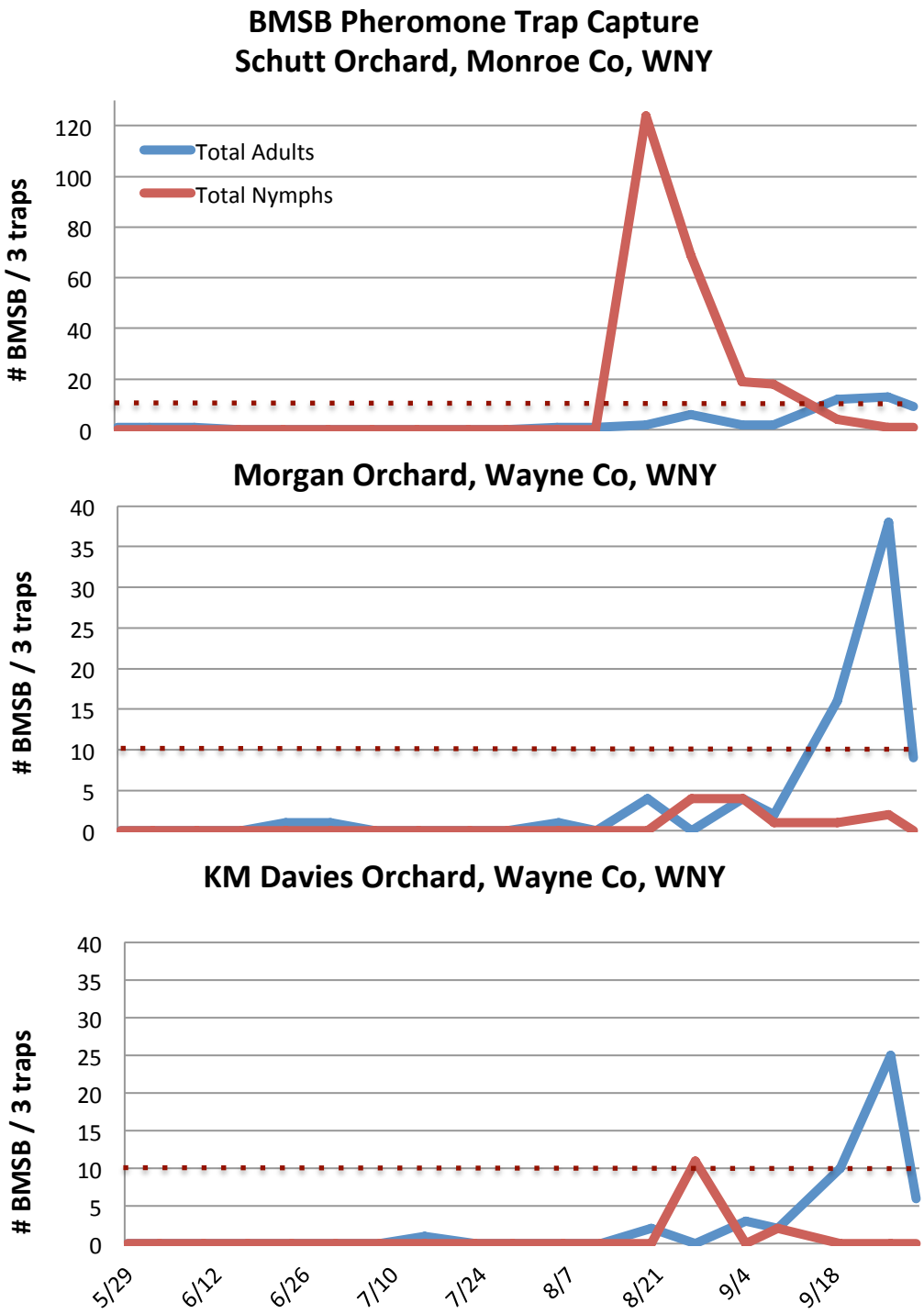
Oaks Orchard

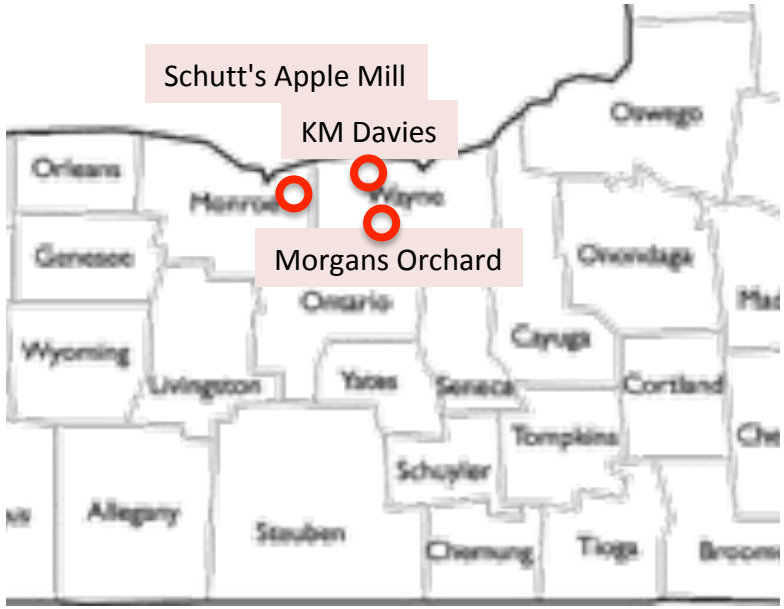
Dobbins Orchard

Burch Orchard

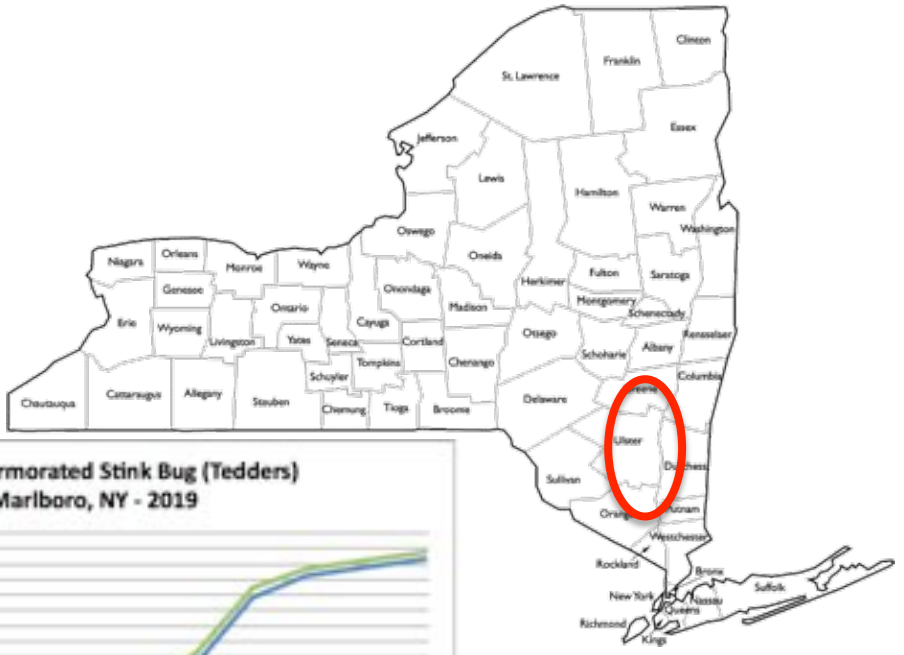


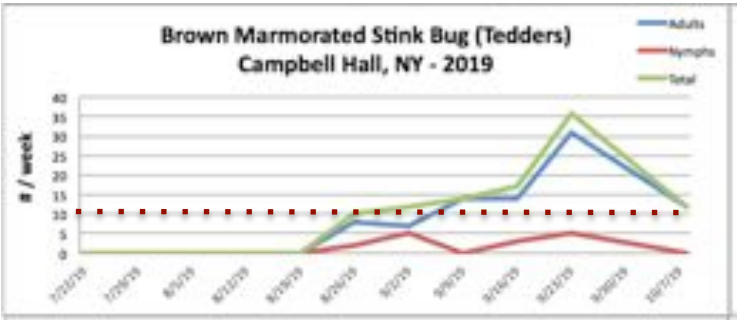
Elizabeth Tee – CCE LOFT

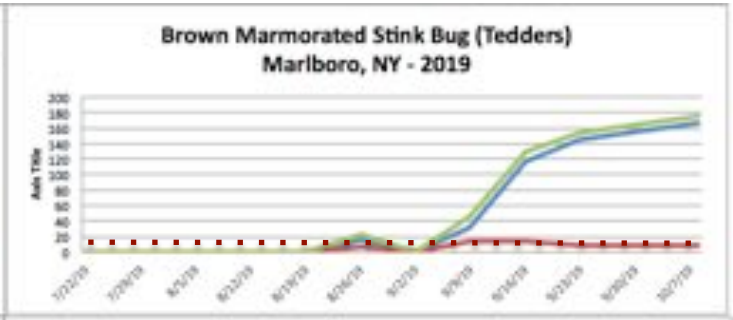


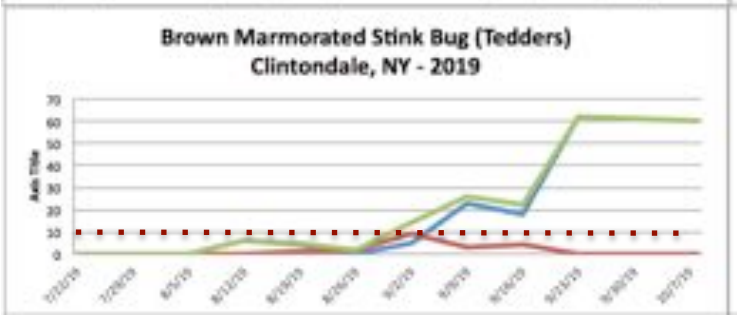


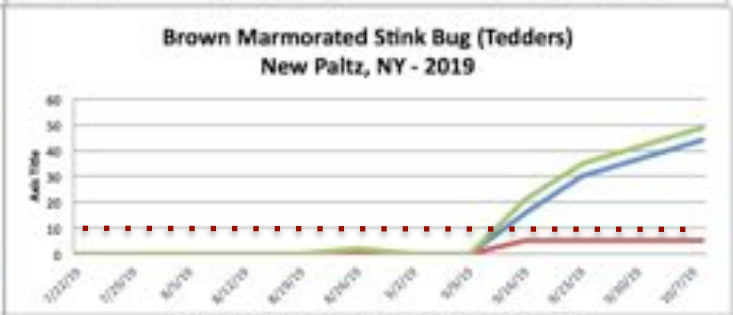
Art Agnello – Cornell AgriTech

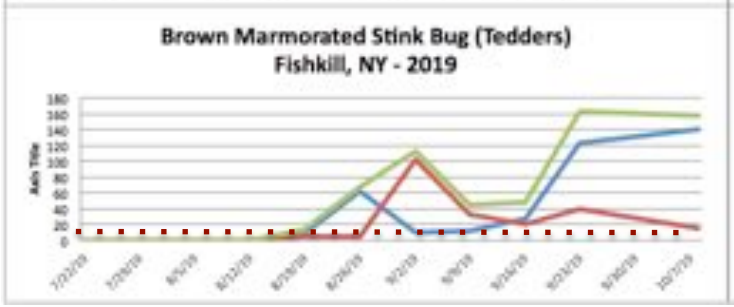

St. Lawrence
Franklin
Clinton
Essex
Jefferson
Lewis
Hamilton
Warren
Washington
Oswego
Oneida
Herkimer
Fulton
Saratoga
Niagara
Orleans
Monroe
Wayne
Onondaga
Madison
Montgomery
Schenectady
Genesee
Ontario
Cayuga
Erie
Wyoming
Livingston
Yates
Seneca
Cortland
Otsego
Rensselaer
Tompkins
Chenango
Schoharie
Albany
Schuyler
Columbia
Chautauqua
Cattaraugus
Allegany
Steuben
Chemung
Tioga
Broome
Delaware
Ulster
Sullivan
Dutchess
Orange
Putnam
Westchester
Rockland
Bronx
New York
Nassau
Queens
Suffolk
Richmond
Kings

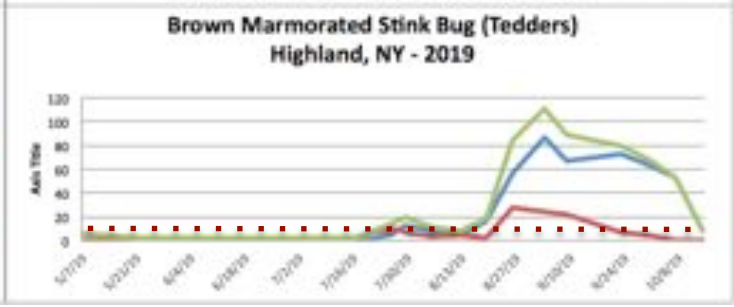

Brown Marmorated Stink Bug (Tedders)
Campbell Hall, NY - 2019
Adults
Nymphs
Total
/ week

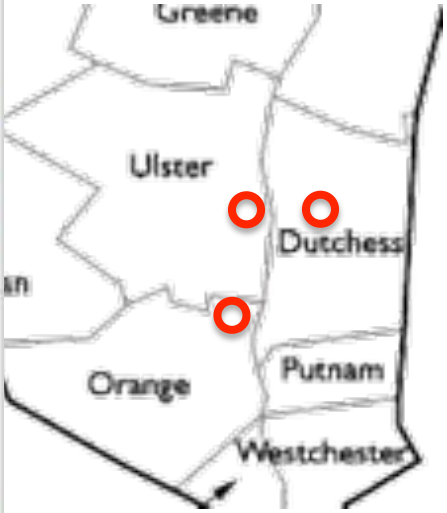

Brown Marmorated Stink Bug (Tedders)
Marlboro, NY - 2019
Axis Title


Brown Marmorated Stink Bug (Tedders)
Clintondale, NY - 2019
Axis Title


Brown Marmorated Stink Bug (Tedders)
New Paltz, NY - 2019
Axis Title


Brown Marmorated Stink Bug (Tedders)
Fishkill, NY - 2019
Axis Title


Brown Marmorated Stink Bug (Tedders)
Highland, NY - 2019
Axis Title


Greene
Ulster
Dutchess
Orange
Putnam
Westchester

Thanks to the staff at the HVRL for all their support:

Research Support Specialist I	Dana Acimovic
Laboratory Technician	Lydia Brown
Research Assistant	Christopher Leffelman
Research Assistant	Lucas Canino
Research Assistant	Ben Lee
Farm Manager	Albert Woelfersheim
Administrative Assistant	Erica Kane
Administrative Assistant	Christine Kane
HRVL & NEWA Weather Data.....	Christopher Leffelman, Albert Woelfersheim

Support from NYS Ag. & Mkts, ARDP, FMC Corp, Dow AgroSciences, Bayer, NYS SCRI, NYS Orchards & Farmers

Thank You For Your Attention

Technical & Summer Staff
Cicada Brood II Emergence Year (2013)

BMSB mortality based on direct contact bioassays – organophosphates, IRAC 1B

G. Krawczyk, PSU FREC 2011.

PRODUCT	ACTIVE INGREDIENT	FIELD RATE tested	FRUIT REGISTRATION*	% DIRECT MORTALITY**			RESIDUAL: LETHALITY INDEX[1]
				24 h	72 h	120 h	
Acephate 97UP	acephate	4 oz	Nonbearing/border	13	42	63	88
Acephate 97UP	acephate	1 lb	Nonbearing/border	10	45	73	88
Diazinon 50W	diazinon	3 lb	PF, SF	0	3	7	20
Guthion	azinphos-methyl	2 lb	PF	3	13	27	71
Imidan	phosmet	4 lb	PF, SF	2	20	35	20
Lorsban Adv.	chlorpyrifos	3 pt	Before bloom	42	73	82	89
Penncap-M	methyl parathion	6 pt	Not registered	65	82	87	93
Thionex 50W	endosulfan	2 lb	PF, SF	52	98	100	90
Thionex 50W	endosulfan	4 lb	PF, SF	33	98	100	90

PF- Pom Fruits, SF- Stone Fruits, G- Grapes

** *Mortality includes dead plus moribund*

[1] – *based on dry residual bioassays T. Leskey, USDA ARS*

BMSB mortality based on direct contact bioassays – pyrethroids, IRAC 3

G. Krawczyk, PSU FREC 2011.

PRODUCT	ACTIVE INGREDIENT	FIELD RATE tested	FRUIT REGISTRATION*	Percent DIRECT MORTALITY**			RESIDUAL: LETHALITY INDEX[1]
				24 h	72 h	120 h	
Asana XL	esfenvalerate	14 oz	Apple, Pear, SF	15	27	48	43
Baythroid XL	beta-cyfluthrin	2 oz	PF, SF, G	7	13	37	55
Baythroid XL	beta-cyfluthrin	2.8 oz	PF, SF, G	42	30	53	55
Bifenture EC	bifenthrin	12.8 oz	G, Pears	98	100	100	92
Brigade 2EC	bifenthrin	10 oz	G, Pears	100	100	95	92
Danitol 2.4EC	fenpropathrin	12 oz	PF, SF, G	87	65	60	67
Danitol 2.4 EC	fenpropathrin	16 oz	PF, SF, G	95	82	82	67
Hero	bifenthrin zeta-cypermethrin	10 oz	Not registered	93	87	82	92 52
Lambda-Cy EC	lambda-cyhalothrin	4.4 fl oz	Not registered	52	40	35	53
Mustang Max	zeta-cypermethrin	4 oz	PF, SF, G	67	37	30	52
Pounce 25 WP	permethrin	16 oz	PF, SF	45	42	35	77
Warrior II	lambda-cyhalothrin	2 oz	PF, SF	73	72	77	53
Warrior II	lambda-cyhalothrin	2.5 oz	PF, SF	52	51	53	53

**PF- Pome Fruits, SF- Stone Fruits, G- Grapes*
*** Mortality includes dead plus moribund*

[1] – based on dry residual bioassays T. Leskey, USDA ARS

BMSB mortality based on direct contact bioassays – carbamates (IRAC 1A)

G. Krawczyk, PSU FREC 2011.

PRODUCT	ACTIVE INGREDIENT	FIELD RATE	FRUIT REGISTRATION*	Percent DIRECT MORTALITY**			RESIDUAL LETHALITY INDEX[1]
				24 h	72 h	120 h	
Carzol SP	formetanate	1 lb	PF, SF	58	68	68	64
Lannate LV	methomyl	2 pt	Apple, Peach, G	88	90	90	90
Lannate LV	methomyl	3 pt	Apple, Peach, G	87	92	92	90
Lannate SP	methomyl	6 oz	Apple, Peach, Nectarine	52	55	60	90
Lannate SP	methomyl	9 oz	Apple, Peach, Nectarine	88	92	92	90
Lannate SP	methomyl	12 oz	Apple, Peach, Nectarine	85	87	87	90
Lannate SP	methomyl	16 oz	Apple, Peach, Nectarine	92	98	98	90
Sevin XLR Plus	carbaryl	3 pt	PF, SF	3	12	8	9
Vydate L	oxamyl	4 pt	Apple, Pear	52	58	63	34
Vydate L	oxamyl	6 pt	Apple, Pear	68	73	82	34

**PF- Pome Fruits, SF- Stone Fruits, G- Grapes*

*** Mortality includes dead plus moribund*

[1] – *based on dry residual bioassays T. Leskey, USDA ARS*

BMSB mortality based on direct contact bioassays – neonicotinoids, IRAC 4A

G. Krawczyk, PSU FREC 2011.

PRODUCT	ACTIVE INGREDIENT	FIELD RATE tested	Fruit REGISTRATION*	Percent DIRECT MORTALITY**			RESIDUAL LETHALITY INDEX[1]
				24 h	72 h	120 h	
Actara	thiamethoxam	4 oz	PF, SF, G	92	95	97	56
Actara	thiamethoxam	5 oz	PF, SF, G	77	95	98	56
Admire Pro	imidacloprid	7 oz	PF, G	82	87	88	40
Assail 30SG	acetamiprid	6 oz	PF, SF, G	87	87	63	19
Assail 30SG	acetamiprid	8 oz	PF, SF, G	83	83	95	19
Assail 70WP	acetamiprid	3.4 oz	PF, SF, G	78	83	75	19
Belay	clothianidin	6 oz	PF, Peach, G	100	100	100	56
Calypso 4F	thiacloprid	8 fl oz	PF	58	52	53	18
Endigo ZC	lambda-cyhalothrin thiamethoxam	3 oz	PF, SF	93	95	87	53 56
Endigo ZC	lambda-cyhalothrin thiamethoxam	5 oz	PF, SF	98	100	98	53 56
Leverage 360	imidacloprid beta-cyfluthrin	2.8 oz	PF, SF, G	95	93	88	40 55
Scorpion 35SL	dinotefuran	5 oz	G	97	98	97	67
Venom	dinotefuran	3 oz	G	93	98	98	67

*PF- Pom Fruits, SF- Stone Fruits, G- Grapes

** Mortality includes dead plus moribund

[1] – based on dry residual bioassays T. Leskey, USDA ARS

BMSB mortality based on direct contact bioassays – mixes (IRAC various)

G. Krawczyk, PSU FREC 2011.

PRODUCT	ACTIVE INGREDIENT	FIELD RATE tested	FRUIT REGISTRATION*	Percent DIRECT MORTALITY**			RESIDUAL LETHALITY INDEX[1]
				24 h	72 h	120 h	
Endigo ZC	lambda-cyhalothrin thiamethoxam	3 oz	PF, SF	93	95	87	53 56
Endigo ZC	lambda-cyhalothrin thiamethoxam	5 oz	PF, SF	98	100	98	53 56
Hero	bifenthrin zeta-cypermethrin	10 oz	Not registered	93	87	82	92 52
Leverage 360	imidacloprid beta-cyfluthrin	2.8 oz	PF, SF, G	95	93	88	40 55
Besiege	lambda-cyhalothrin chlorantraniliprole	10 fl oz	PF, SF	40	40	38	53 N/A
Voliam Flexi	thiamethoxam chlorantraniliprole	6 oz	PF, SF, G	100	100	100	56 N/A

*PF- Pom Fruits, SF- Stone Fruits, G- Grapes
** Mortality includes dead plus moribund

[1] – based on dry residual bioassays T. Leskey, USDA ARS

BMSB mortality based on direct contact bioassays – Various IRAC Groups

G. Krawczyk, PSU FREC 2011.

PRODUCT	ACTIVE INGREDIENT	FIELD RATE tested	FRUIT REGISTRATION*	Percent DIRECT MORTALITY**			RESIDUAL LETHALITY INDEX[1]
				24 h	72 h	120 h	
Agri-Mek 0.15EC	abamectin	15 oz	Apple, Pear, SF, G	2	7	8	16
Altacor	chlorantraniliprole	3 oz	PF, SF, G	3	7	12	N/A
Avaunt	indoxacarb	6 oz	PF, SF, G	0	5	13	11
Beleaf 50SG	flonicamid	2.8 oz	PF, SF	5	10	15	8
cyazypyr		100 ppm	Not registered	5	3	5	
Delegate WG	spinetoram	7 oz	PF, SF, G	0	3	15	N/A
Esteem 0.86EC	pyriproxyfen	5 oz	PF, SF	0	5	8	N/A
M-Pede	insecticidal soap	2%	PF, SF, G	0	2	5	N/A
M-Pede Spray	insecticid soap	2%	PF, SF, G	10	15	15	N/A
Neemix 4.5	azadirachtin	16 oz	PF, SF, G	0	2	8	N/A
Rimon 0.83EC	novaluron	30 oz	PF, SF	0	2	2	N/A
Stylet Oil	mineral oil	2%		2	2	5	
Besiege	lambda-cyhalothrin chlorantraniliprole	12 fl.ox.	PF, SF	40	40	38	53 N/A
Voliam Flexi	thiamethoxam chlorantraniliprole	6 oz	PF, SF, G	100	100	100	56 N/A

*PF- Pome Fruits, SF- Stone Fruits, G- Grapes

** Mortality includes dead plus moribund

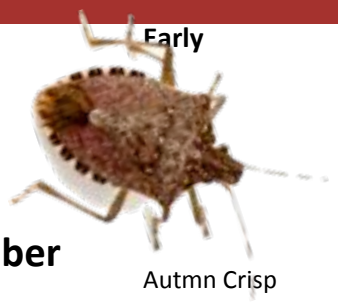
[1] – based on dry residual bioassays T. Leskey, USDA ARS

NY Management Options

Insecticide Group	Product	Active Ingredient	% Adult BMSB Mortality[1]
Pyrethroid	Bifenture	bifenthrin	100
	Danitol	fenpropathrin	95
	Warrior II	lambda-cyhalothrin	73
Carbmate	Lannate	methomyl	92
	Vydate	oxymyl	68
Neonicotinoid	Actara	thiamethoxam	92
	Assail	acetamiprid	87
Pre-mix	Leverage 360	imidacloprid and β-cyfluthrin	95
	Endigo	lambda-cyhalothrin and thiamethoxam	98
	Voliam Flexi	chlorantraniliprole and thiamethoxam	98

1. Direct contact activity of insecticides against BMSB adults in a lab setting may be very high, yet the activity of field-aged residue may, over time, quickly becomes ineffective at preventing feeding injury.

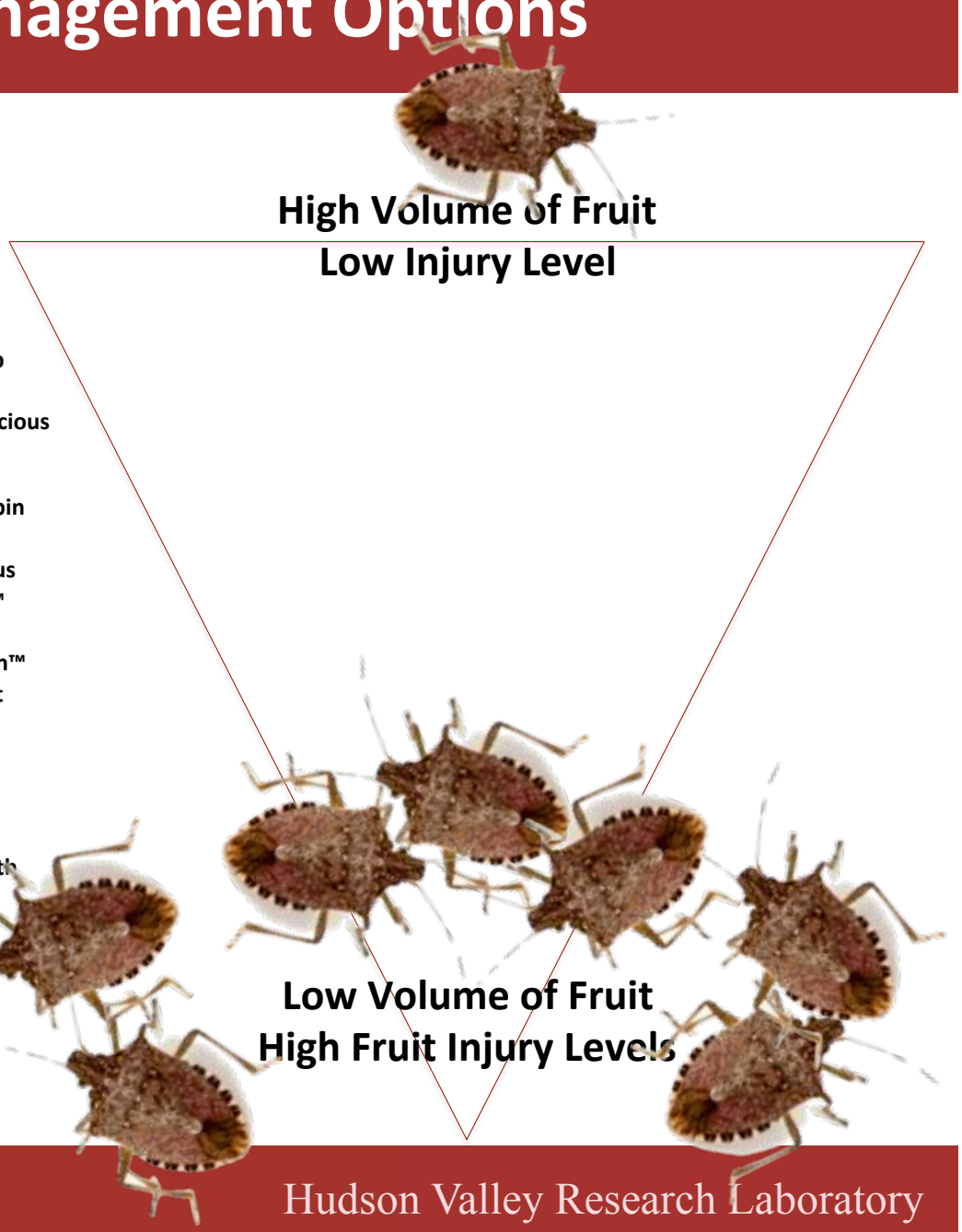
NY BMSB Management Options



	Early	Mid	Late	
August		Blondee Sansa	Blondee Paulared Tydeman Zestar	Single application in early August 14-7d PHI
September	Autmn Crisp Blondee Gala Ginger Gold	Autmn Crisp Cortland Empire Honeycrisp	Ambrosia Autmn Crisp Braeburn Golden Delicious	2-4 applications beginning in early August 35-7d PHI
	Golden Supreme Greening Jonamac McIntosh Twenty Ounce Tydeman	Macoun Shamrock Snow Sweet Tydeman	Jonagold Mutsu/Crispin Pinova Red Delicious Ruby Frost™ Ruby Jon Snap Dragon™ Snow Sweet	
October	Braeburn Cameo Fortune Idared Northern Spy Rome Ruby Frost™ Shizuka Snap Dragon™ Snow Sweet	Braeburn Cameo Fuji Granny Smith Ruby Frost™ Shizuka Spigold Suncrisp	Braeburn Cameo Fuji Granny Smith Spigold Suncrisp	5-8 applications beginning in early August 35-7d PHI
				>6 applications beginning in early August 35-7d PHI
November	Pink Lady			

NY BMSB Management Options

	Early	Mid	Late
August		Blondee Sansa	Blondee Paulared Tydeman Zestar
September	Autmn Crisp Blondee Gala Ginger Gold Golden Supreme Greening Jonamac McIntosh Twenty Ounce Tydeman	Autmn Crisp Cortland Empire Honeycrisp Macoun Shamrock Snow Sweet Tydeman	Ambrosia Autmn Crisp Braeburn Golden Delicious Jonagold Mutsu/Crispin Pinova Red Delicious Ruby Frost™ Ruby Jon Snap Dragon™ Snow Sweet
October	Braeburn Cameo Fortune Idared Northern Spy Rome Ruby Frost™ Shizuka Snap Dragon™ Snow Sweet	Braeburn Cameo Fuji Granny Smith Ruby Frost™ Shizuka Spigold Suncrisp	Braeburn Cameo Fuji Granny Smith Spigold Suncrisp
November	Pink Lady		



2017 Field Application

Applications using tractor mounted sprayer on 20th Sept. 300 psi. using dilute handgun applications:

• Closure SC	7d PHI	5.75	fl.oz./A
• Bifrenthrin SC	14d PHI	32.0	fl.oz./A
• Actara 25 WDG	14d PHI	5.5	oz./A
• Venerate XC	0d PHI	128.0	fl.oz./A

BMSB adults placement beginning on 20th Sept.

- 24h; 48hr; 72hr placement. Collection made after 7d of placement.
- Insects placed inside portion cups with screened bottoms, rubber band onto the north side of the tree and the north side of those apples to reduce sun exposure.
- BMSB adults placed into growth chamber supplied green beans
- Observations made 2x/wk
- Fruit harvested on 12 Oct. for fruit feeding evaluations

Field Application: Fruit Residue

BMBS placed on apples 24 hours after pesticide application on Sep.20, 2017.

	Number of feeding sites per fruit	Dimpling per fruit	Corking per fruit	Clean fruit (%)	Survival (%)
Closer SC	0.1a	0.1a	0.1a	90a	0a
Bifenthrin	0a	0a	0a	100a	0a
Actara	0a	0a	0a	100a	0a
Venerate	0a	0a	0a	100a	20a
UTC	0.7a	0a	0a	50a	20a
Kruskal-Walis Test, Prob>ChiSq	0.0115	0.8123	0.8123	0.0136	0.3071

Means followed by the same letter are not significantly different by Steel-Dwass Method at α=0.05 Apples were rated on Oct.12, 2017. BMSB survival were recorded 7 days after exposure to the fruit.

Field Application: Fruit Residue

BMBS placed on apples 48 hours after pesticide application on Sep.20, 2017.

	Number of feeding sites per fruit	Dimpling per fruit	Corking per fruit	Clean fruit (%)	Survival (%)
Closer SC	0.1b	0.1a	0.1a	90a	0a
Bifenthrin	0b	0a	0a	100a	10a
Actara	0.1b	0.1a	0.1a	90a	0a
Venerate	0.2ab	0a	0a	80ab	40a
UTC	1.2a	0.4a	0.4a	20b	0a
Kruskal-Walis Test, Prob>ChiSq	0.0001	0.4313	0.4313	0.0002	0.0873

Means followed by the same letter are not significantly different by Steel-Dwass Method at α=0.05 Apples were rated on Oct.12, 2017. BMSB survival were recorded 7 days after exposure to the fruit.

Field Application: Fruit Residue

BMBS placed on apples 72 hours after pesticide application on Sep.20, 2017.

	Number of feeding sites per fruit	Dimpling per fruit	Corking per fruit	Clean fruit (%)	Survival (%)
Closer SC	0.2a	0.2a	0.2a	90a	80a
Bifenthrin	0.2a	0.2a	0.2a	90a	10b
Actara	0.2a	0.2a	0.2a	90a	100a
Venerate	0.1a	0a	0a	90a	70a
UTC	1.2a	0.1a	0.1a	40a	30ab
Kruskal-Walis Test, Prob>ChiSq	0.0687	0.9254	0.9254	0.0795	0.0006

Means followed by the same letter are not significantly different by Steel-Dwass Method at α=0.05 Apples were rated on Oct.12, 2017. BMSB survival were recorded 7 days after exposure to the fruit.

BMSB Adult Topical Treatment

- Applications were made topically to BMSB adults on 28th Sept. placed on the tree in 10 replicates for each treatment
  - Insects were placed inside portion cups with screened bottoms with a rubber band on the north side of the tree and the north side of those apples to reduce sun exposure as much as possible
- Fruit was collected on 12th October for fruit feeding evaluations

BMSB Adult Topical Treatment

BMSB treated topically on Sep.28, 2017 and placed on apples for 7 days.

	Number of feeding sites per fruit	Dimpling per fruit	Corking per fruit	Clean fruit (%)	Survival (%)
Closer SC	0.3a	0.2a	0.2a	90a	30b
Bifenthrin	0.1a	0a	0a	90a	0b
Actara	0a	0a	0a	100a	10b
Venerate	0a	0a	0a	100a	100a
UTC	0.9a	0a	0a	60a	90a
Kruskal-Walis Test, Prob>ChiSq	0.1288	0.5348	0.5348	0.1093	<.0001

Means followed by the same letter are not significantly different by Steel-Dwass Method at α=0.05 Apples were rated on Oct.12, 2017. BMSB survival were recorded 7 days after exposure to the fruit.

Drape Net Exclusion
Hail, Birds, Crop Load Mgt; Late Season Insects

Early Season IPM			
Actara	5.5 oz/A	18th May	PC, EAS,
Avaunt	6.0 oz/A	25th May	
Entrust SC	10.0 fl oz/A	8th June	CM
Venerate	2.0 gal/A	21st June	

Season Long IPM			
Actara	5.5 oz./A	18th May	PC, EAS,
Avaunt	6.0 oz./A	25th May	
Imidan 70W	4.9 lbs/A	7th June	CM
Esteem 35WP	5.0 oz/A	21st June	CM, San Jose Scale
Assail 30SG	4.0 oz/A	21st June	
Altacor	4.5 oz/A	21st June	
Assail 30SG	4.0 oz/A	10th July	LR
Exirel	20.5 oz/A	24th July	AM & LR
Exirel	20.5 oz/A	31st July	
Exirel	20.5 oz/A	6th Aug.	AM, CM, &SB
Bifenture 10DF	32.0 oz/A	6th Aug.	

1. Treatments were applied concentrate using a Slim Line tower sprayer using 100 psi, delivering 0.05 to 0.07 gal/tree traveling at 2.5-2.86 mph averaging 74 gal/A. Insecticide calculations (presented as amt/A) are based on a standard dilution of 100 gal/A . Maintenance applications for disease control and crop load reduction were also made using concentrate airblast, delivery using 100 GPA. Rows were treated with Drape net shortly after fruit set.

Drape Net Exclusion
Late Season Insect Mgt. & Exclusion

Net Type Treatment / Rate	PC	EAS	TPB	Lf.Rlr	Int. Lep	Ext.Lep	CM
1. Black Drape Early Season IPM	3.0 a	0.6 a	4.4 a	10.9 bc	2.2 b	18.8 b	11.3b
2. White Drape Early Season IPM	4.7 a	0.0 a	4.4 a	11.9 b	3.1 b	20.3 b	12.5 b
3. No Drape Early Season IPM	**10.8 a**	**0.8 a**	**4.6 a**	**22.9 a**	**6.7 a**	**37.1 a**	**23.8 a**
4. Black Drape Season Long IPM	5.6 a	1.3 a	7.8 a	0.3 d	0.0 c	1.6 c	0.3 c
5. White Drape Season Long IPM	7.8 a	0.9 a	7.8 a	0.3 d	0.0 c	0.6 c	0.0 c
6. No Drape Season Long IPM	**5.6 a**	**0.9 a**	**5.0 a**	**0.6 cd**	**0.3 c**	**1.3 c**	**0.0 c**
P value	0.2062	0.6565	0.5998	0.0001	0.0001	0.0001	0.0001

Drape Net Exclusion
Late Season Insect Mgt. & Exclusion

Net Type / Treatment / Rate	AM.P	AM.T	SJS	SB	Clean
1. Black Drape Early Season IPM	0.6 b	0.6 b	96.3 a	0.3 b	1.3 c
2. White Drape Early Season IPM	0.9 b	0.9 b	95.6 a	0.9 b	0.6 c
3. No Drape Early Season IPM	**7.5 a**	**4.2a**	**83.8 b**	**3.8 a**	**1.3 c**
4. Black Drape Season Long IPM	0.0 bc	0.0 b	6.6 d	0.0 b	82.5 a
5. White Drape Season Long IPM	0.3 b c	0.3 b	20.0 c	0.0 b	65.9 b
6. No Drape Season Long IPM	**0.6 b c**	**0.3 b**	**6.3 d**	**0.9 b**	**81.3 a**
P value	0.0001	0.0135	0.0001	0.0154	0.0001

Questions??

E-mail: pjj5@cornell.edu

2019 Insecticide Registrations Updates

Minecto Pro SC

EPA Reg. No. 100-1592

Active ingredient: cyantraniliprole / abamectin

- IRAC 6/28 2nd gen. diamide
- Requires a NIS for foliar absorbtion
- Labeled in pome fruits to contol lep. complex, plum curculio, European apple sawfly, pear psylla, white apple leafhopper, mite complex
- REI 12 hrs. PHI 28d in pome fruit

Labeled for NYS pome and stone fruit: Not For Use in Long Island

2019 Insecticide Registrations Updates

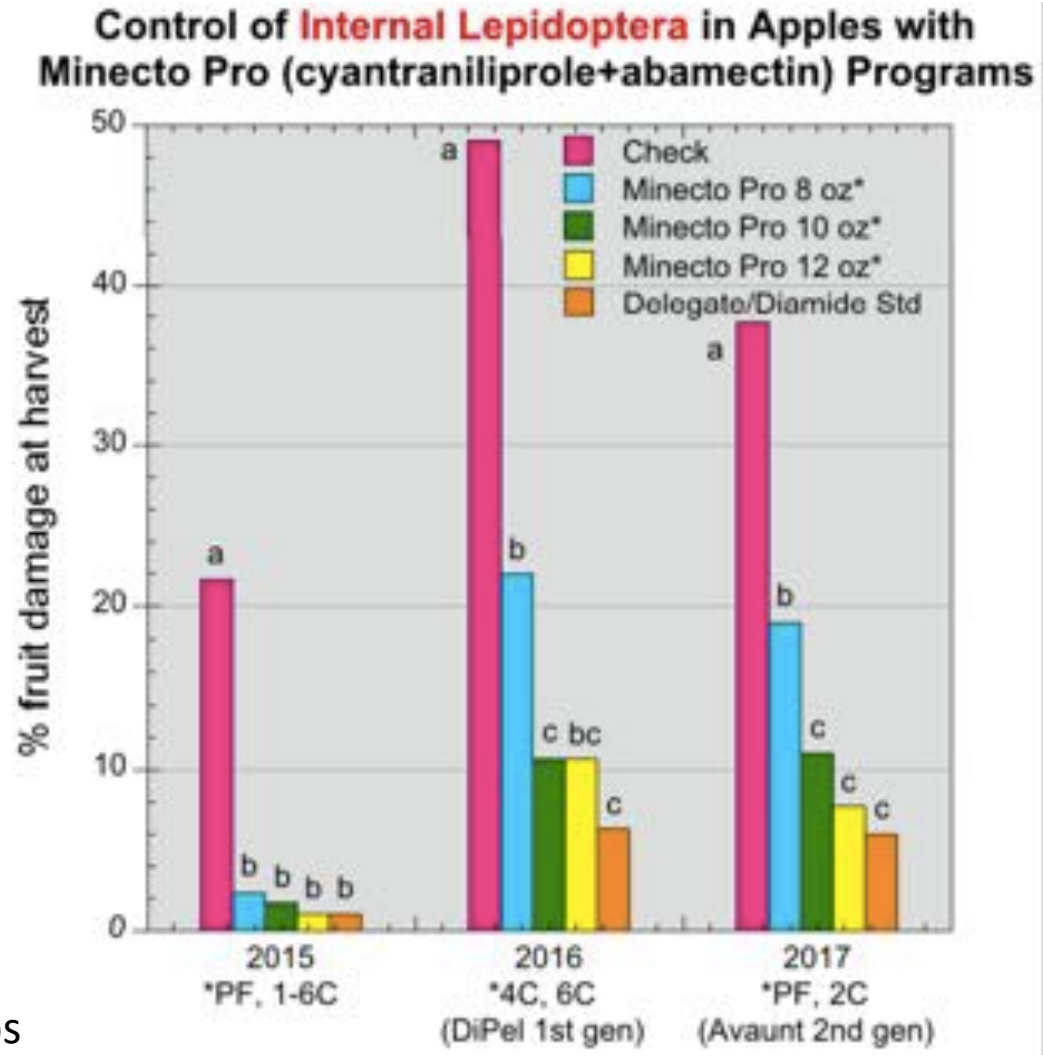
Minecto Pro SC

2 application program

Numeric differences:

Rate response

Strong Diamide standard



2017 Geneva Exp. Station. Agnello & Combs

2019 Insecticide Registrations Updates

Closer SC

EPA Reg. No. 62719-623

- Active ingredient: sulfoxaflor
- IRAC 4C; translaminar movement (xylem)
- Labeled in pome fruits against aphids, fleahoppers, plant bugs, **stink bugs**, whiteflies and certain psyllids, **scale**, and thrips
- Low toxicity to bees and most beneficials.

Not yet labeled for NYS (Likely 2019)

2019 Insecticide Registrations Updates

Cormoran

ADAMA

Active ingredient: Novaluron 9.1% / Acetamiprid 7.3%

EPA Reg. No. 66222-264

- IRAC 15 / 4A
- Dispersible concentrate
- REI 12hr, PHI 12 d
- Labeled in pome fruits: Aphids, Apple Maggot, Budmoths, Codling Moth, Dogwood Borer, European Apple Sawfly, Fruitworm, Leafhoppers, Leafminers, Leafrollers, Lesser Appleworm, Plum Curculio, Japanese Beetle, Mealybug, Mullein Plant Bug, San Jose Scale (Suppression), Oriental Fruit Moth, Plant Bug, Pear Psylla, White Apple Leafhopper, Stink Bugs Including Brown Marmorated Stink Bug.

Not yet labeled for NYS (Submitted in 2017)

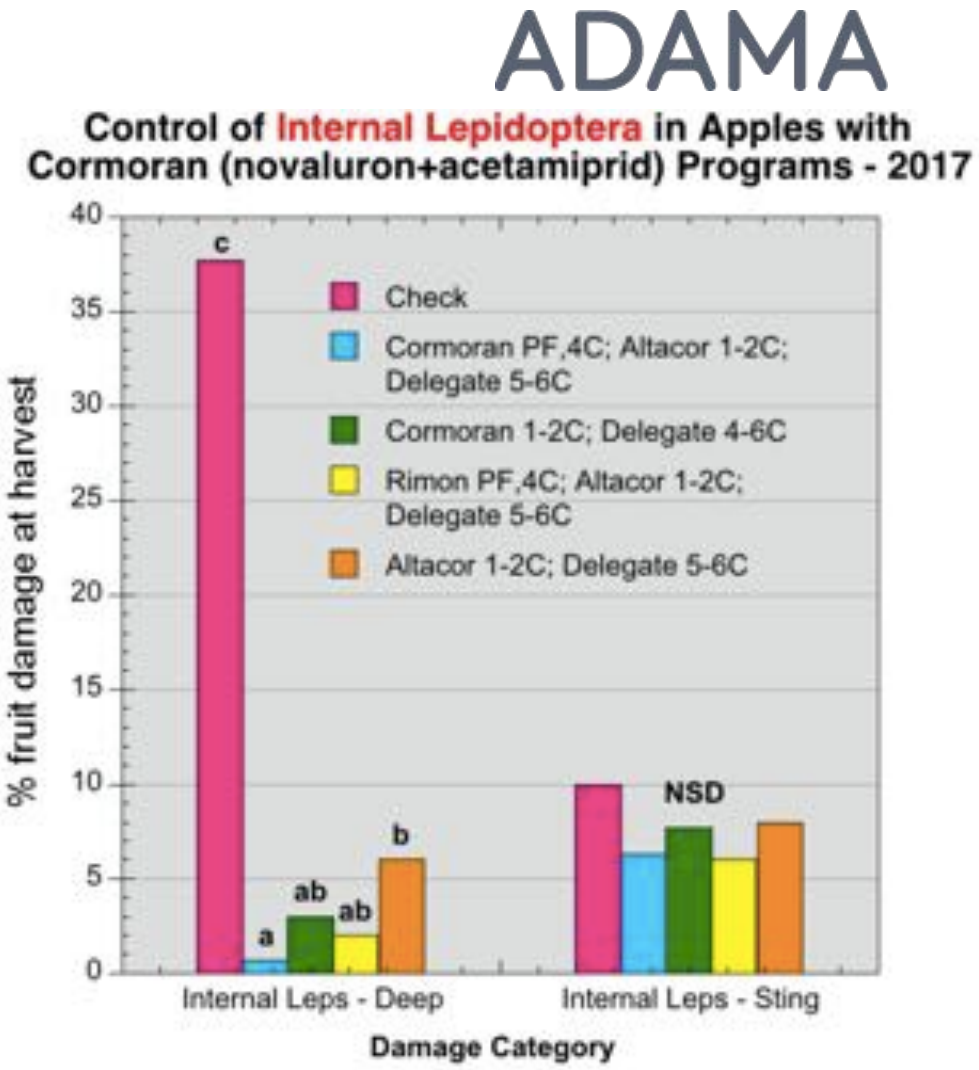
2019 Insecticide Registrations Updates

Cormoran

Resistance management strategies:

- Include rotation for each generation
- Use 2 applications for 1st of insecticide A

and 2 apps. for 2nd generation of insecticide B



2017 Geneva Exp. Station. Agnello & Combs

2018 Insecticide Updates: On The Horizon

Harvanta: Active ingredient cyclaniliprole

- EPA Reg. No. 71512-26-88783
- Diamide class (IRAC 28)
- Same mode of action as Altacor and Exirel
- Activates ryanodine receptors preventing muscle contraction.
- Plum curculio and Leps in apples and peach
- Small fruit uses for spotted wing Drosophila
- Low toxicity to bees

2019 Insecticide Registrations Updates

Venerate XC (Burkholderia spp.)

Marrone Bio Innovations

EPA Reg. No. 84059-14

- Biological insecticide derived from a bacterium;
- Labeled in pome fruits against **San Jose scale**, pear psylla, **stink bug** and plum curculio, and in stone fruits against leafrollers and other leps.
- OMRI-approved
- Low toxicity to bees and most beneficials.

2019 Insecticide Registrations Updates

Grandevo (Chromobacterium subtsugae)

Marrone Bio Innovations

- EPA Reg. No. 84059-17
- A microbial containing fermentation solids from **bacterium**, labeled against **internal feeding leps** and **leafrollers** in pome and stone fruit.
- Stomach poison, impacting feeding, fecundity and oviposition; toxic to aquatic invertebrates.
- OMRI-approved
- Low toxicity to bees and most beneficials.

2019 Insecticide Registrations Updates

Sivanto Prime (flupyradifurone)

EPA Reg. No. 264-1141

- In the butenolide class (IRAC 4D)
- Registered in pome fruits against aphids (except WAA), leafhoppers, **San Jose scale**, and pear psylla.
- EPA Reduced-Risk, low bee toxicity and safe to beneficials.

Not yet available in Suffolk & Nassau Counties except under FIFRA Section 24 (C), special needs label.

2019 Miticide Registrations Updates

Banter SC (bifenazate)

EPA Reg. No. 70506-322

- Acaricide registered in pome and stone fruit
- Same a.i. as *Acramite*, WDG & SC formulations

Onager Optek (hexythiazox)

EPA Reg. No. 10163-337

- Liquid (emulsion) formulation same a.i. as *Savey*
- Acaricide registered in pome and stone fruit

2019 Insecticide Registrations Updates

Cidetrak CMDA Combo Meso-A

Codling moth pheromone

EPA Reg. No. 51934-16)

- Mating disruption dispenser for codling moth registered in pome fruits
- "Meso" formulation releases for 120-150 days
- **Hand-applied at 18-36 dispensers per acre**.
- Monitor CM using high release lures
- Apply insecicides 1st yr; along boarders 2nd yr.

2020 Tree Fruit Insecticides

Actara (thiamethoxam)

Altacor (chlorantraniliprole)

} **Pre-Mix A.I. Combinations**

Centaur (buprofezin) IGR

Endigo (**thiamethoxam**/ lambda-cyhalothrin)

Exirel (cyantraniliprole)

Intrepid 2F (methoxyfenozid) IGR

Minecto Pro (cyantraniliprole/abamectin)

Voliam Flexi (**thiamethoxam/ chlorantraniliprole**)

Voliam Xpress (**chlorantraniliprole**/ lambda-cyhalothrin)

2020 Tree Fruit Insecticides

Organophosphates & Carbamates

*Diazinon - WAA

*Lannate (methomyl) – Internal Lep. complex

*Imidan (phosmet) – PC, AM

Lorsban (chlorpyrifos) – BSB, DWB

Malathion - AM

Sevin (carbaryl) – Crop Load Reduction + PC

2020 Tree Fruit Insecticides

Pyrethroids

*Asana (esfenvalerate) 7 App. @ 14.5 oz./A; 21d PHI

*Baythroid (*b*-cyfluthrin) 1 App. 7d PHI

*Danitol (fenpropathrin) 2 App. @ 16.0 oz./A; 14d PHI

*Leverage (*b*-cyfluthrin/ imidacloprid) 1 App. 7d PHI

*Warrior (lambda-cyhalothrin) 5 App. @ 2.56 oz./A; 21d PHI

*Pounce (permethrin) 4 App. @ 16.0 oz./A; pre-bloom only

2020 Tree Fruit Insecticides

Other Active Ingredients (Organic-OMRI)

§Entrust (spinosad) – Int. Lep & LR

§Grandevo (Chromobacterium subtsugae)

§Aza-Direct, §Neemix (azadirachtin)

§M-Pede (insecticidal soap)

§Surround (kaolin) – Pear psylla / PC

§Venerate XC (*Burkholderia* spp. strain A396)

2020 Tree Fruit Insecticides

Other Active Ingredients (IPM)

Avaunt (indoxacarb) Plum curculio

Beleaf (flonicamid) WAA

Delegate (spinetoram) Leafroller, Int. Lep

2020 Tree Fruit Insecticides

Neonicotinoids

*Admire Pro (imidacloprid) Aphid complex

Assail (acetamiprid) Apple Maggot & CM

Hudson Valley Tree Fruit
Grower Challenges – 20 Year Later


AP

Hudson Valley Apple Growers Face Their Troubles

MARY MACVEAN June 27, 1990

Challenges: Production & Markets

1990

- "Consumers, and farmers, worry about chemicals (FQPA on the horizon).
- Farmers can get more money selling their land to developers than farming it.
- Bad weather and pests, of course, never go away." *Steve Clarke*
- "$100 Million lost from drop in McIntosh sales… Alar *Larry Cosman*
- "Pest management costs going through the roof"
- "Competition from the Northwest and abroad is squeezing NY apples off store shelves."
- "It's like they're (apple farmers) treading water" *Elizabeth Ryan*

2020

- Wholesale Production:
  - Access to Markets
    - Have markets closed to Hudson Valley Apple Growers?
    - 2019 Loss of markets to varieties Empire, Golden Delicious, Jonamac …