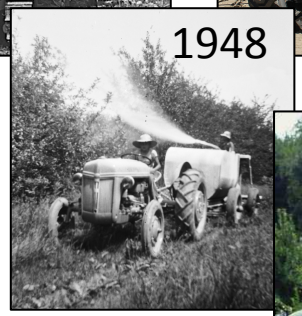
Pre-Bloom Decision Making for Your Orchard

Insect Pest Management
Biological Control

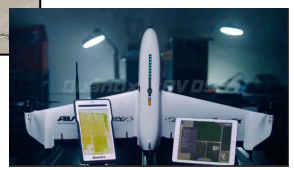


2019

Tree Architecture

Robotic

- Harvesting
- Spraying
- Scouting



Pre-bloom Tree Fruit Meeting
March 8, 2019, 2-5PM
Hudson Valley Research Lab Conf. Rm., Highland, NY

THE JENTSCH LAB

INSECT BIOLOGY, ECOLOGY, AND MANAGEMENT IN HUDSON VALLEY AGRICULTURAL COMMODITIES

Welcome to the Jentsch Lab

HVRL ENTOMOLOGY STAFF

Research Our research and extension outreach program is directed by Cornell University's Department of Entomology and located at the Hudson Valley Research Laboratory (now FARM), in Highland, NY. We are a part of the New York State Agricultural Experiment Station in Geneva, NY, with the laboratory building owned by a non-profit cooperative tree fruit grower organization (HVRL Inc.).

Partnership This cooperative partnership with the College of Agriculture and Life Science (CALS), Cornell Cooperative Extension (CCE) and the Eastern New York Commercial Horticultural Program (ENYCHP) providing continuous agricultural Research and Extension to the agricultural community on Tree Fruits and Vegetables in the Hudson Valley since 1923.

Education Research-based extension outreach continues to provide valuable problem solving solutions to New York farmers through educational programs organized by Cornell Cooperative Extension and participating associations. Horticultural plant protection programs at the Hudson Valley Lab are especially important to sustaining the viability of agriculture in the Hudson Valley and Northeast as agricultural production is ultimately the best way to preserve open space and economic stability in the rapidly developing corridor between Albany and New York City.

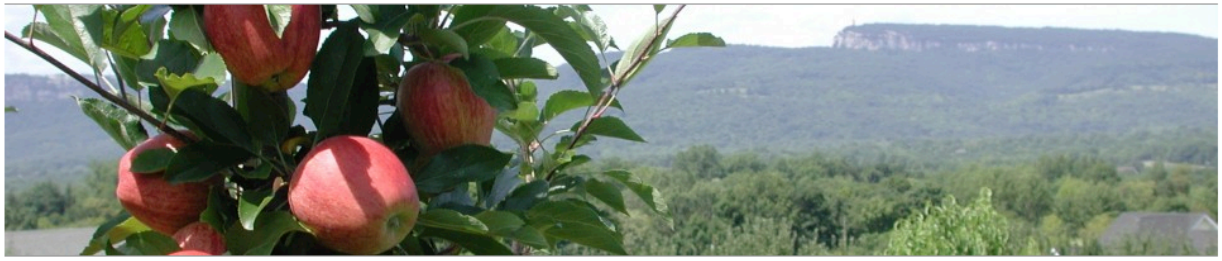
Search

2017 BLOG PAGES

- Workshop Announcement: 'Pre-Bloom Decision Making for Your Orchard' Friday March 8th 2019, 2-5PM; HVRL February 22, 2019
- Entomology presentations available on-demand: 2019 ENYCHP Winter Fruit Schools Desmond Hotel & Conf Ctr., Albany, NY February 20, 2019
- Workshop Announcement: March 8th 2019 'Pre-Bloom Decision Making for Your Orchard' January 25, 2019
- Celebrating the Life of a Tree Fruit Grower and Dear Friend: Remembering Leonard Clarke January 16, 2019
- Last Chance To Sign Up: The Heirloom Orchard: A Three-Day Series on Estate Orchard

THE JENTSCH LAB

INSECT BIOLOGY, ECOLOGY, AND MANAGEMENT IN HUDSON VALLEY AGRICULTURAL COMMODITIES



WELCOME ENTOMOLOGY BROWN MARMORATED STINK BUG INVASIVES ORGANIC AG. RESEARCH TREE FRUIT THE HEIRLOOM ORCHARD
VEGETABLE SWEET CORN SMALL FRUIT GRAPE IN THE NEWS

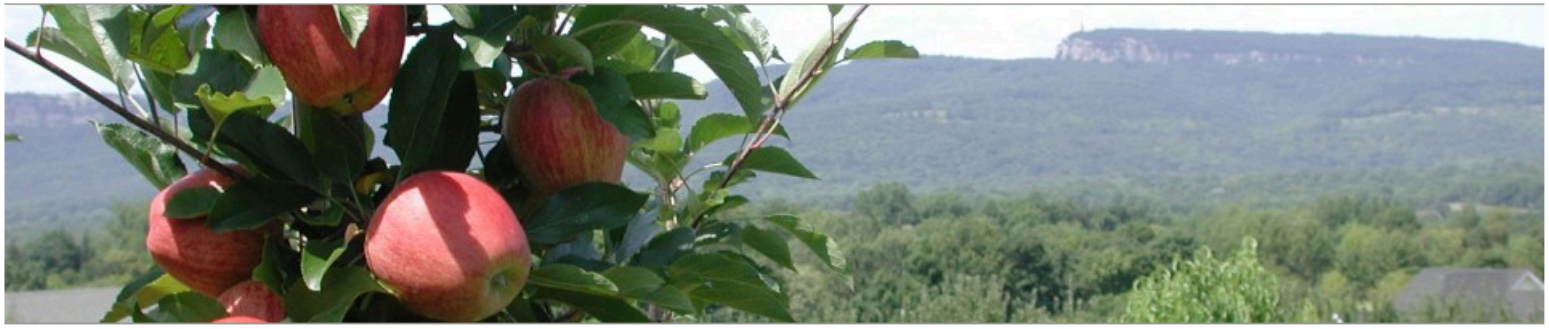
Extension Publications

Plant Protection Presentations

On-Farm Research

THE JENTSCH LAB

INSECT BIOLOGY, ECOLOGY, AND MANAGEMENT IN HUDSON VALLEY AGRICULTURAL COMMODITIES



Plant Protection Presentations

Fruit Production IPM Presentations:

2018

Pre-Bloom Decision Making for Your Orchard

New Materials vs. Old Pests New Monitoring for New Pests. Maine State Pomological Society Preseason Tree Fruit Meeting, March 6, 2019, Lewiston Auburn College, Lewiston ME

Biological Control of Brown Marmorated Stink Bug, Halyomorpha halys Stål (Hemiptera: Pentatomidae) in NYS, Red Tomato Annual Growers Meeting, March 1, 2019, Henry A. Wallace Center, Hyde Park, NY

Search

2017 BLOG PAGES

- Last chance sign up today (or walk-in tomorrow) for the 'Pre-Bloom Decision Making for Your Orchard' Workshop.....This Friday, March 8th, 2019, From 2-5 PM; Free for HVRL members! March 7, 2019

Tree Fruit Industry: Changes to Production Practices

Harvest Efficiencies

- 3D to 2D Tree Architecture
  - Platform harvesting (2010)
- Robotic Harvesting (Research 2016)
- Robotic Spraying

On-Farm Data Analytics

- Robotic Drone Scouting
- Remote Data Collection

Pre-Bloom Decision Making for Your Orchard

Pre-Bloom Insect Presence: **Monitoring Methods**

Predictive Modeling

- What insects need to be managed
- Management Overlap

Tree Fruit Insecticide Efficacy

Pre-Bloom Decision Making for Your Orchard

Orchard History (Yearly Pack Out)

- Knowing your orchard
- Orchard Borders / Interior (hot spots)

Pre-Bloom Decision Making for Your Orchard

Orchard History (Yearly Pack Out)

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- Orchard Borders / Interior (hot spots)

Endemic Insects – Reside within orchards (**high exposure = resistance**)

- Tarnish Plant Bug (borders / pond & hedgerow broad leaf weeds)
- Codling Moth (LAW, OFM) (within orchard blocks - hibernaculum)
- Obliquebanded Leafroller (within orchard blocks - hibernaculum)
- San Jose Scale (within orchard blocks – limb & trunk)
- Wooly Apple Aphid (within the soil, OW pop. feed on roots)
- Mite complex (within orchard blocks)

Pre-Bloom Decision Making for Your Orchard

Orchard History (Yearly Pack Out)

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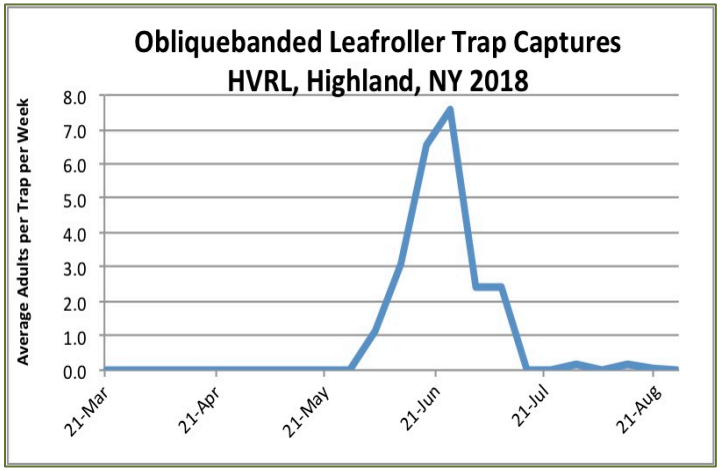
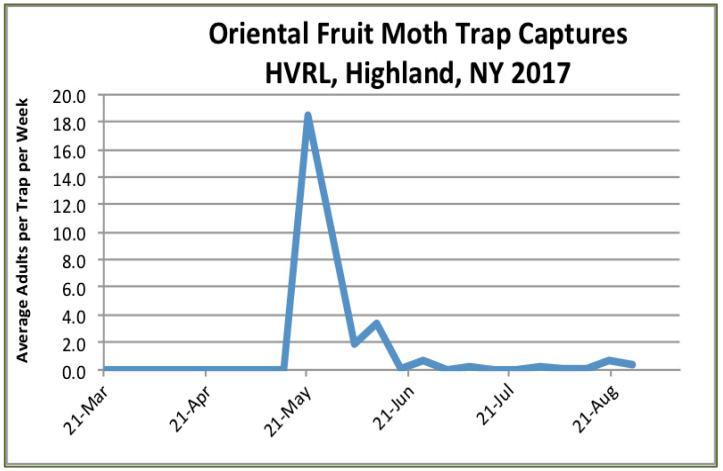
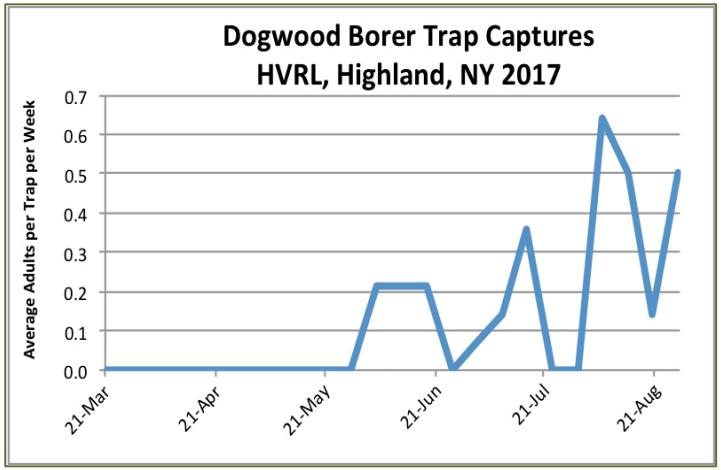
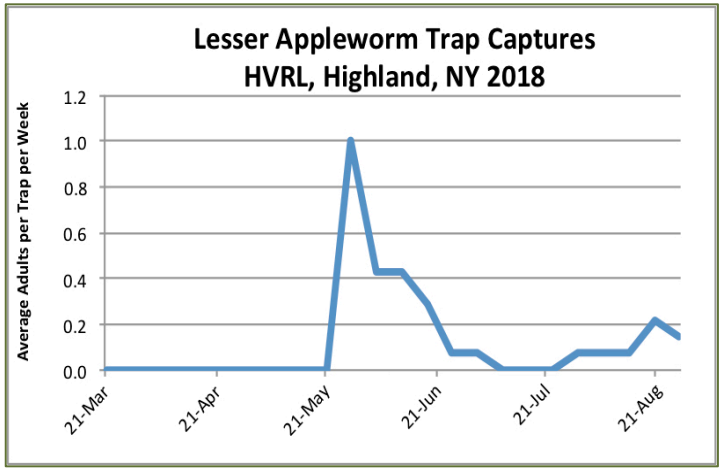
Migratory Insects – Reside outside and migrate to the orchard

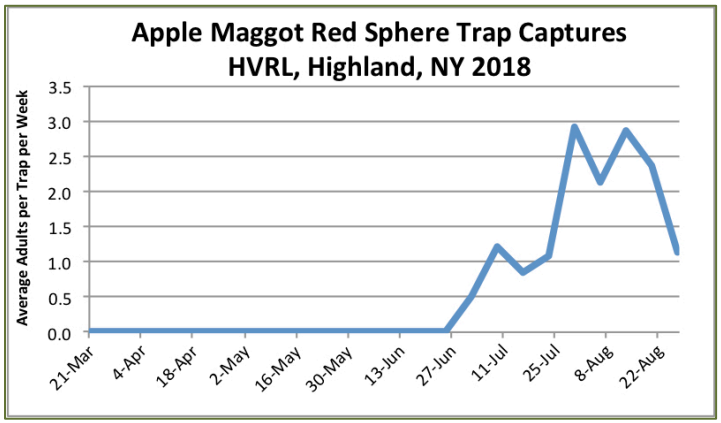
- Plum Curculio (hedgerows and wooded borders as adult)
- Apple Maggot (hedgerows and alternate hosts (abandoned apple))

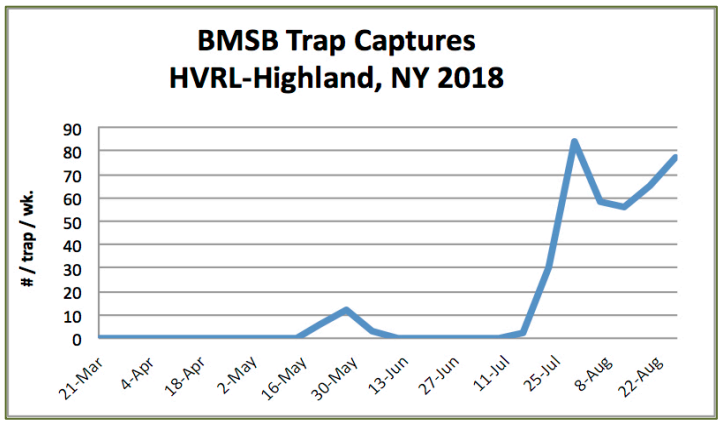

Obliquebanded Leafroller Trap Captures
HVRL, Highland, NY 2018
Average Adults per Trap per Week
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
21-Mar
21-Apr
21-May
21-Jun
21-Jul
21-Aug

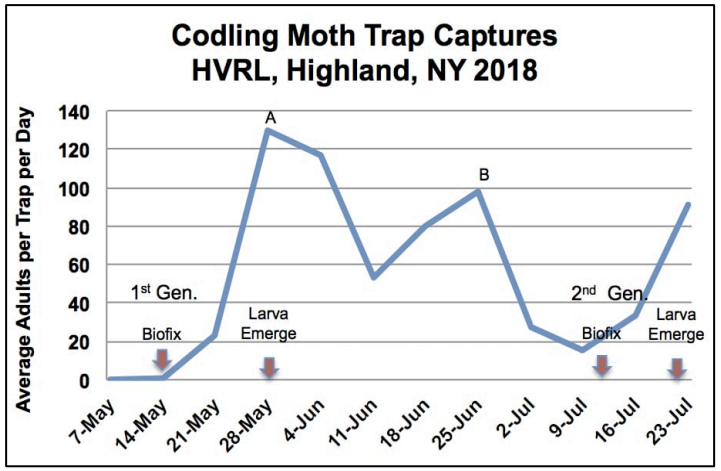

Oriental Fruit Moth Trap Captures
HVRL, Highland, NY 2017
Average Adults per Trap per Week
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
21-Mar
21-Apr
21-May
21-Jun
21-Jul
21-Aug

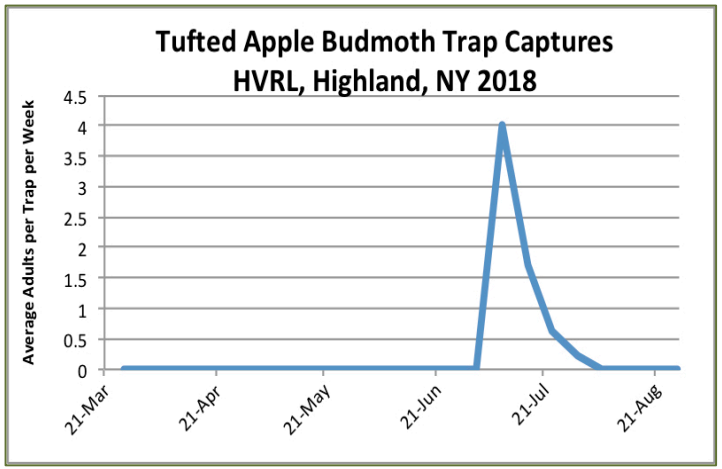

Dogwood Borer Trap Captures
HVRL, Highland, NY 2017
Average Adults per Trap per Week
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
21-Mar
21-Apr
21-May
21-Jun
21-Jul
21-Aug

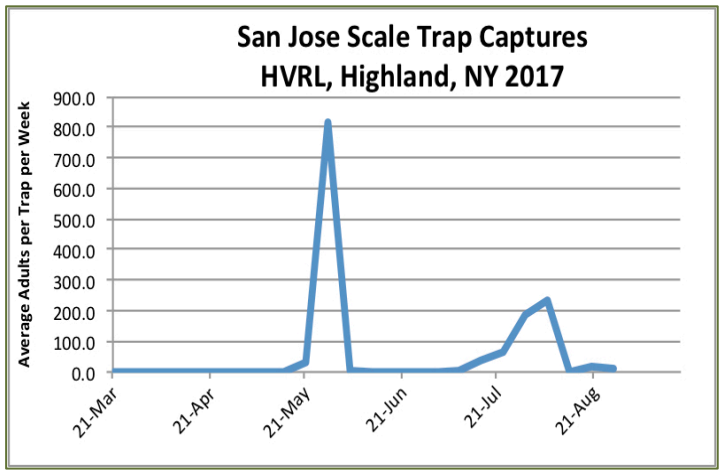

Lesser Appleworm Trap Captures
HVRL, Highland, NY 2018
Average Adults per Trap per Week
1.2
1.0
0.8
0.6
0.4
0.2
0.0
21-Mar
21-Apr
21-May
21-Jun
21-Jul
21-Aug

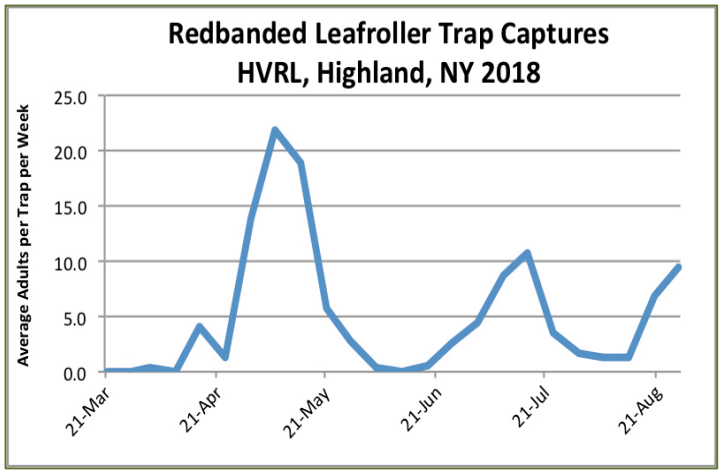

Apple Maggot Red Sphere Trap Captures
HVRL, Highland, NY 2018
Average Adults per Trap per Week
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
21-Mar
4-Apr
18-Apr
2-May
16-May
30-May
13-Jun
27-Jun
11-Jul
25-Jul
8-Aug
22-Aug

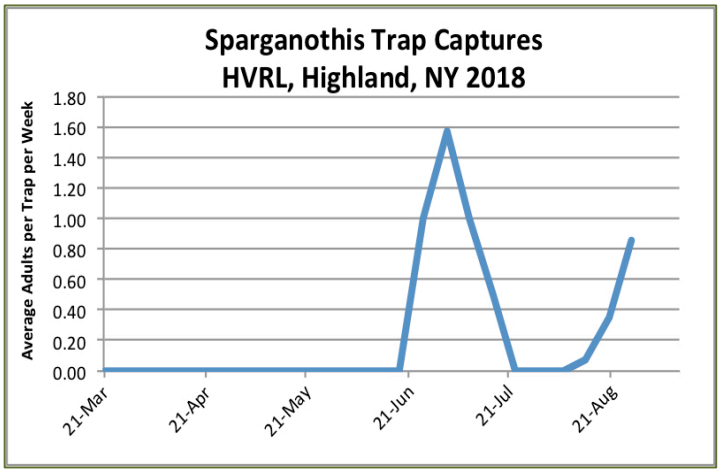

BMSB Trap Captures
HVRL-Highland, NY 2018
/ trap / wk.
90
80
70
60
50
40
30
20
10
0
21-Mar
4-Apr
18-Apr
2-May
16-May
30-May
13-Jun
27-Jun
11-Jul
25-Jul
8-Aug
22-Aug

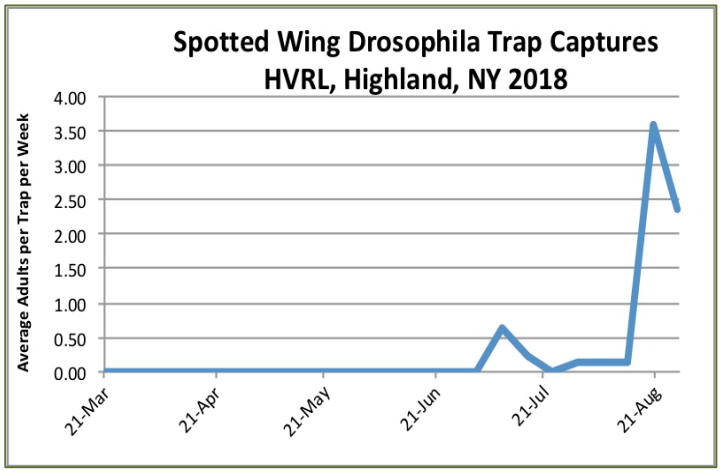

Codling Moth Trap Captures
HVRL, Highland, NY 2018
Average Adults per Trap per Day
140
120
100
80
60
40
20
0
A
B
1st Gen.
Biofix
Larva
Emerge
2nd Gen.
Biofix
Larva
Emerge
7-May
14-May
21-May
28-May
4-Jun
11-Jun
18-Jun
25-Jun
2-Jul
9-Jul
16-Jul
23-Jul


Tufted Apple Budmoth Trap Captures
HVRL, Highland, NY 2018
Average Adults per Trap per Week
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
21-Mar
21-Apr
21-May
21-Jun
21-Jul
21-Aug

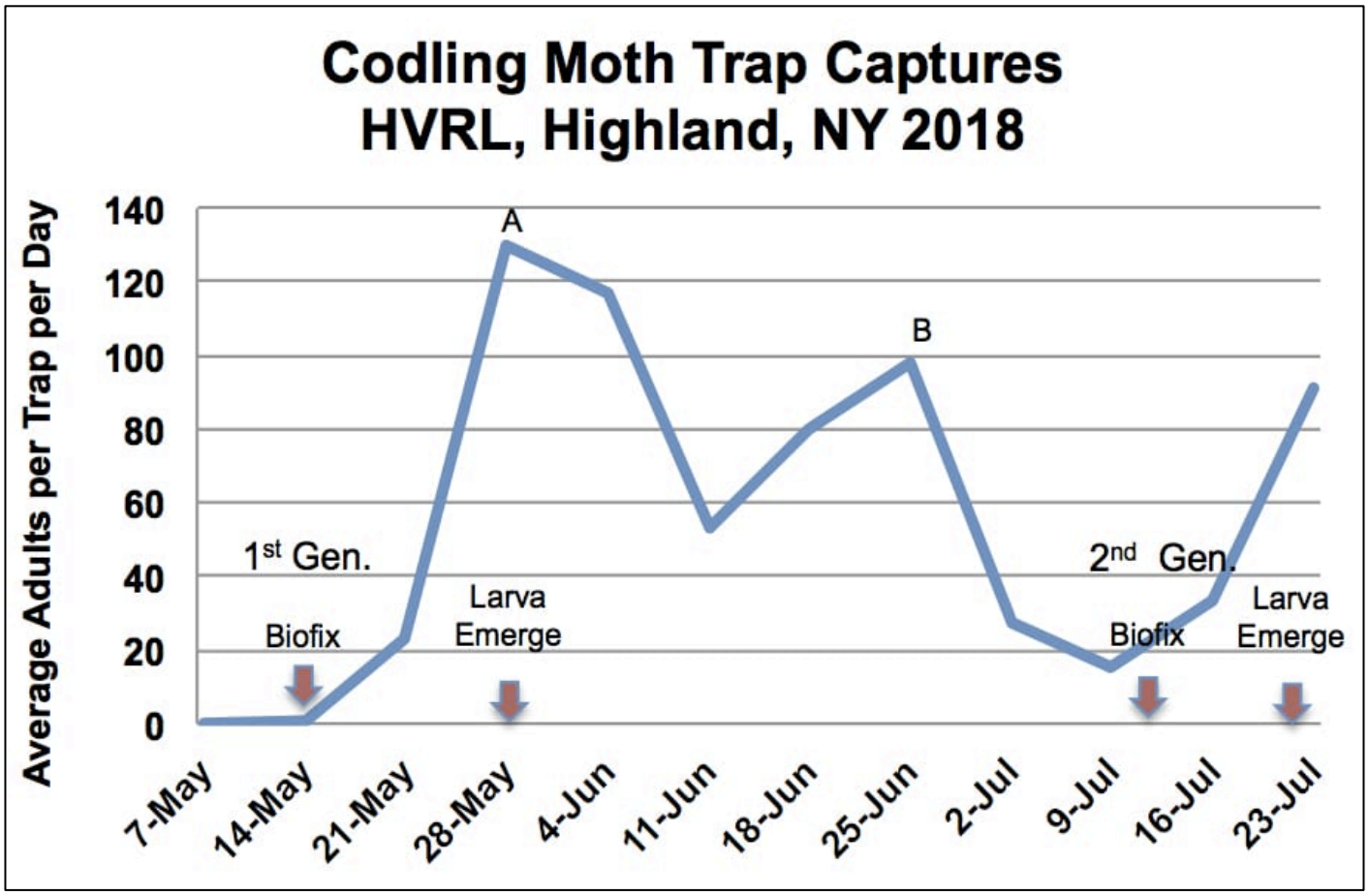

San Jose Scale Trap Captures
HVRL, Highland, NY 2017
Average Adults per Trap per Week
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
21-Mar
21-Apr
21-May
21-Jun
21-Jul
21-Aug


Redbanded Leafroller Trap Captures
HVRL, Highland, NY 2018
Average Adults per Trap per Week
25.0
20.0
15.0
10.0
5.0
0.0
21-Mar
21-Apr
21-May
21-Jun
21-Jul
21-Aug


Sparganothis Trap Captures
HVRL, Highland, NY 2018
Average Adults per Trap per Week
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
21-Mar
21-Apr
21-May
21-Jun
21-Jul
21-Aug


Spotted Wing Drosophila Trap Captures
HVRL, Highland, NY 2018
Average Adults per Trap per Week
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
21-Mar
21-Apr
21-May
21-Jun
21-Jul
21-Aug

Pre-Bloom Decision Making for Your Orchard



McIntosh Phenology

Year	GT	HIG	T.C.	Pink	Bloom	P.F.	PF DD_{43}	PF DD_{50}	
2018	4/18	4/28	4/30	5/4	5/9	5/14	514.5	274.6	
2017	4/2	4/11	4/17	4/24	4/27	5/8	603.0	312.0	
2016	3/17	4/04	4/11	4/18	4/25	5/12	597.8	186.0	
2015	4/13	4/20	4/27	5/4	5/6	5/12	527.8	304.5	
2014	4/14	4/18	4/28	5/6	5/12	5/19	594.9	321.5	
2013	4/13	4/18	4/24	4/30	5/7	5/13	510.6	262.2	
2012	3/16	3/18	3/25	4/8	4/16	4/21	506.5	267.5	
2011	4/4	4/11	4/25	5/1	5/9	5/16	526.0	268.3	
2010	3/20	4/2	4/6	4/10	4/20	4/28	305.0	168.5	
2009	4/6	4/13	4/20	4/24	4/29	5/7	452.0	219.6	
2008	4/10	4/14	4/21	4/24	4/29	5/7	404.5	207.4	
2007	4/2	4/21	4/24	5/2	5/7	5/14	397.0	228.3	
2006	4/3	4/10	4/17	4/22	4/26	5/8	419.2	220.0	
2005	4/7	4/11	4/18	4/26	5/8	5/16	493.7	258.6	
2004	4/12	4/19	4/22	4/27	5/3	5/13	558.5	304.7	
2003	4/7	4/16	4/24	4/28	5/1	5/19	595.0	324.7	
2002	3/25	4/10	4/14	4/15	4/16	5/7	498.0	283.2	
2001	4/11	4/17	4/25	4/28	5/2	5/10	481.3	288.0	
2000	3/27	4/2	4/14	4/24	5/1	5/8	488.3	346.0	
1999	4/2	4/7	4/12	4/26	5/2	5/13	530.1	174.4	
1998	3/27	3/29	4/1	4/10	4/23	5/4	498.1	382.0	
1997	4/4	4/11	4/21	4/28	5/1	5/14	422.7	250.0	
1996	4/15	4/19	4/22	4/29	5/6	5/20			
1995	4/11	4/19	4/24	4/29	5/8	5/19			
1994	4/11	4/14	4/20	4/29	5/5	5/12			
1993	4/12	4/19	4/24	5/1	5/3	5/10			
1992	4/13	4/21	5/4	5/7	5/12	5/18			
1991	4/5	4/8	4/11	4/17	4/27	5/7			
1990	3/21	4/16	4/23	4/26	4/29	5/11			
1989	3/29	4/17	4/28	5/3	5/9	5/19			
1988	4/4	4/9	4/28	5/5	5/8	5/19			
1987	3/29	4/10	4/18	4/22	4/29	5/16			
1986	3/31	4/7	4/19	4/27	5/3	5/8			
1985	3/30	4/12	4/15	4/22	5/4	5/12			
1984	4/10	4/26	4/30	5/6	5/16	5/24			
1983	4/12	4/27	4/30	5/2	5/5	5/18			
1982	4/15	4/22	4/30	5/4	5/13	5/17			
1981		4/8	4/16	4/22	5/5	5/14			
1980	4/15		4/24	5/2	5/5	5/10			
Earliest day	**3/16**	**3/18**	**3/25**	**4/8**	**4/16**	**4/21**	305.0	168.5	**Low**
Latest day	**4/18**	**4/28**	**5/4**	**5/7**	**5/16**	**5/24**	603.0	382.0	**High**

Midrange: **3/31** (+/-14D)
4/7 (+/-20.5D)
4/14 (+/-20D)
4/22 (+/-14D)
5/1 (+/-15D)
5/7 (+/-16.5D)

Mean days in bloom 9.4 days

Crop and Pest Management Guidelines

A Cornell Cooperative Extension Publication

Cornell Cooperative Extension

Your Purchased Guidelines

2018 Berry Crops

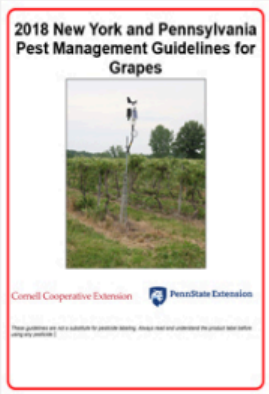
2018 Cornell Guide for the Integrated Management of Berry Crops

View Online | Buy Print

2018 Grapes

2018 New York and Pennsylvania Pest Management Guidelines for Grapes

View Online | Buy Print



2018 Tree Fruit

2018 Cornell Pest Management Guidelines for Commercial Tree Fruit Production

View Online | Buy Print

2019 Tree Fruit

2019 Cornell Pest Management Guidelines for Commercial Tree Fruit Production

View Online | Buy Print

2019 Vegetable Crops

Cornell Integrated Crop and Pest Management Guidelines for Vegetable Crops

View Online | Buy Print

Vegetable Crops

Cornell Integrated Crop and Pest Management Guidelines for Vegetable Crops

View Online | Buy Print

Scouting & Trapping / Monitoring*

Apple Maggot (M) - Red sphere with lure and tangle foot (Border)

Codling Moth (E) - Wing Trap + Pheromone (Bloom)

Mite complex (E) - Scout limbs for egg (GT) foliage for motile colonies

Obliquebanded Leafroller (E) – larva in TC-Bloom, Wing Trap & Phero.

Plum Curculio (M) – Sentinel tree (cherry, Japanese plum) (Border)

San Jose Scale (E) - Wing Trap + Pheromone (Bloom)

Tarnish Plant Bug (M) - Yellow Sticky Card (Border)

Wooly Apple Aphid (E) - Scout foliage for areal colonies

*(E) Endemic (M) Migratory

Activity spectrum of pome fruit insecticides and acaricides.

		Ratings for the Control of														
Trade Name (Active Ingredient)	**IRAC‡**	**AM**	**Aph**	**EAS**	**Int**	**GFW**	**LH**	**OBLR**	**PC**	**PPs**	**RAA**	**RBLR**	**SJS**	**STLM**	**TPB**	**WAA**
*†Actara (thiamethoxam)	4A	1	3	3	1	-	3	0	3	3	3	0	0	2	2	-
*Admire Pro (imidacloprid)	4A	-	3	-	-	-	3	-	-	2	3	-	2	3	-	2
*†Agri-Flex (abamectin/ thiamethoxam	6/4A	1	3	3	1	-	3	0	3	3	3	0	0	3	1	-
*Agri-Mek (abamectin)	6	-	-	-	-	-	3	-	-	3	-	-	-	3	-	-
*†Altacor (chlorantraniliprole)	28	2	1	3	3	3	-	3	2	-	-	3	2	-	1	-
*Pounce (permethrin)	3A	3	2	2	-	3	3	2-3	2	2	2	3	1	3	3	-
*Asana XL (esfenvalerate)	3A	3	2	2	2-3	3	3	2-3	2	2	2	3	1	3	3	-
Assail (acetamiprid)	4A	3	3	2	3	-	3	0	2	2	3	0	2	3	2	2
Avaunt (indoxacarb)	22	2	1	2	2	-	3	0	3	-	0	-	0	2	2	-
§Aza-Direct, §Neemix	18B	-	2	1	2	-	2	-	0	-	2	-	-	3	-	-
§B.t, (§Agree, §Biobit, §Deliver, §Dipel, §Javelin)	11A	0	0	-	2	3	0	3	0	0	0	3	-	0	0	-
*Baythroid (cyfluthrin)	3A	3	2	2	2-3	3	3	2-3	2	-	-	3	-	3	3	-
Beleaf (flonicamid)	9C	-	3	-	-	-	-	-	-	-	-	-	-	-	3	2
*†Besiege (chlorantraniliprole/ lambda-cyhalothrin)	3A/28	3	2	3	3	3	3	3	3	2	2	3	2	3	3	-
*†Centaur (buprofezin)	16	-	-	-	-	-	2	-	-	3	-	-	3	-	-	-

Activity spectrum of pome fruit insecticides and acaricides.

		Ratings for the Control of														
Trade Name (Active Ingredient)	**IRAC‡**	**AM**	**Aph**	**EAS**	**Int**	**GFW**	**LH**	**OBLR**	**PC**	**PPs**	**RAA**	**RBLR**	**SJS**	**STLM**	**TPB**	**WAA**
*Danitol (fenpropathrin)	3A	3	2	2	2-3	3	3	2-3	2	2	2	3	1	3	3	-
Delegate (spinetoram)	5	2	0	-	3	3	-	3	2	3	-	3	-	3	-	-
*diazinon	1B	3	1	-	2	2	1	0	2	0	3	0	2	1	1	3
*†Endigo (thiamethoxam/ lambda-cyhalothrin)	3A/4A	3	2	2	2-3	3	3	2-3	2	2	2	3	2	3	3	-
§Entrust (spinosad)	5	2	0	-	2	3	0	3	0	-	0	3	-	2	0	-
Esteem (pyriproxyfen)	7C	0	0	-	2	0	0	0	0	3	3	0	3	2	0	-
*†Exirel (cyantraniliprole)	28	2	1	3	3	3	3	3	3	3	3	3	0	3	0	0
§Grandevo (*Chromobacterium subtsugae*)	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-
*Imidan (phosmet)	1B	3	1	3	3	1	1	1	3	0	1	3	2	1	1	-
*†Intrepid (methoxyfenozide)	18A	0	0	-	2	-	0	3	0	-	0	3	0	2	0	-
*Lannate (methomyl)	1A	2	2	1	3	3	3	2-3	2	0	1	3	2	3	1	-
*Leverage (cyfluthrin/ imidacloprid)	3A/4A	3	3	2	3	3	3	2-3	3	2	3	3	2	3	3	-
Lorsban (chlorpyrifos)	1B	-	-	-	-	-	-	-	-	-	2	2	3	1	1	-
§M-Pede, Des-X (insecticidal soap)	-	0	2-3	0	0	0	1	0	0	2	1	0	1	0	0	-
Malathion	1B	2	2	2	2	1	1	1	2	0	1	2	-	1	1	-

Activity spectrum of pome fruit insecticides and acaricides.

		Ratings for the Control of														
Trade Name (Active Ingredient)	**IRAC‡**	**AM**	**Aph**	**EAS**	**Int**	**GFW**	**LH**	**OBLR**	**PC**	**PPs**	**RAA**	**RBLR**	**SJS**	**STLM**	**TPB**	**WAA**
*†Minecto Pro (cyantraniliprole/abamectin)	28/6	2	0	0	3	3	3	3	3	3	3	3	0	3	0	0
Movento (spirotetramat)	23	-	3	-	-	-	-	-	-	3	-	-	3	-	-	3
†Nexter (pyridaben)	21	-	0	-	-	-	2	-	-	3	-	-	-	-	-	-
§oil (Stylet, Damoil, PureSpray)	-	-	-	-	1	-	-	-	-	2	-	-	3	1	-	1
*Proclaim (emamectin benzoate)	6	0	0	-	2	3	0	3	1	2	0	3	0	3	0	-
*Rimon (novaluron)	15	-	-	-	3	-	2	3	-	-	-	3	-	3	2	-
Sevin (carbaryl)	1A	2	1	-	2	1	3	2	2	0	1	1	2	1	1	-
*†Sivanto Prime (flupyradifurone)	4D	-	3	-	-	-	3	-	-	3	3	-	3	-	-	2
§Surround (kaolin)	-	2	1	-	2	2	-	-	2	2	0	-	-	2	0	-
*†Voliam Flexi (thiamethoxam/ chlorantraniliprole)	4A/28	-	3	3	3	3	3	3	3	3	3	-	-	2	-	-
*†Vydate (oxamyl)	1A	0	2	-	0	-	2	0	0	0	2	-	-	3	1	-
*Warrior (lambda-cyhalothrin)	3A	3	2	2	2-3	3	3	2-3	2	2	2	3	1	3	3	-

Activity spectrum of pome fruit insecticides and acaricides.

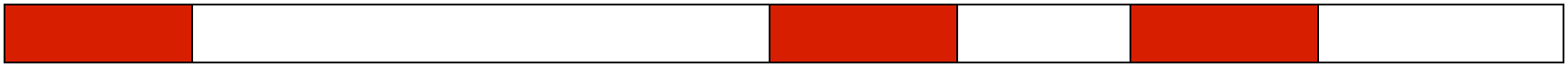
		Ratings for the Control of			
Acaricide	**IRAC‡**	**ARM**	**ERM**	**PRM**	**TSSM**
Acramite, Banter (bifenazate)	25	0	3	0	3
*Agri-Mek (abamectin)	6	3	3	3	2
Apollo (clofentezine)	10A	1	3	1	1
*†Envidor (spirodiclofen)	23	3	3	3	3
Kanemite (acequinocyl)	20B	-	3	-	3
Magister (fenazaquin) [*Reg. in Cherries only*]	21	-	3	-	3
*†Minecto Pro (cyantraniliprole/abamectin)	28/6	--	3	3	2
Nealta (cyflumetofen)	25	-	3	-	3
†Nexter (pyridaben)	21	2	3	2	2
§oil (Sunspray, PureSpray, Damoil, Stylet, Omni)	-	2	3	2	1
Portal (fenpyroximate)	21	3	3	3	3
*Proclaim (emamectin benzoate)	6	-	2	-	2
Savey, Onager (hexythiazox)	10A	-	3	1	1
*Vendex (hexakis)	12B	2	1-2	2	2-3
Zeal (etoxazole)	10B	0	3	0	3

Key to control ratings:

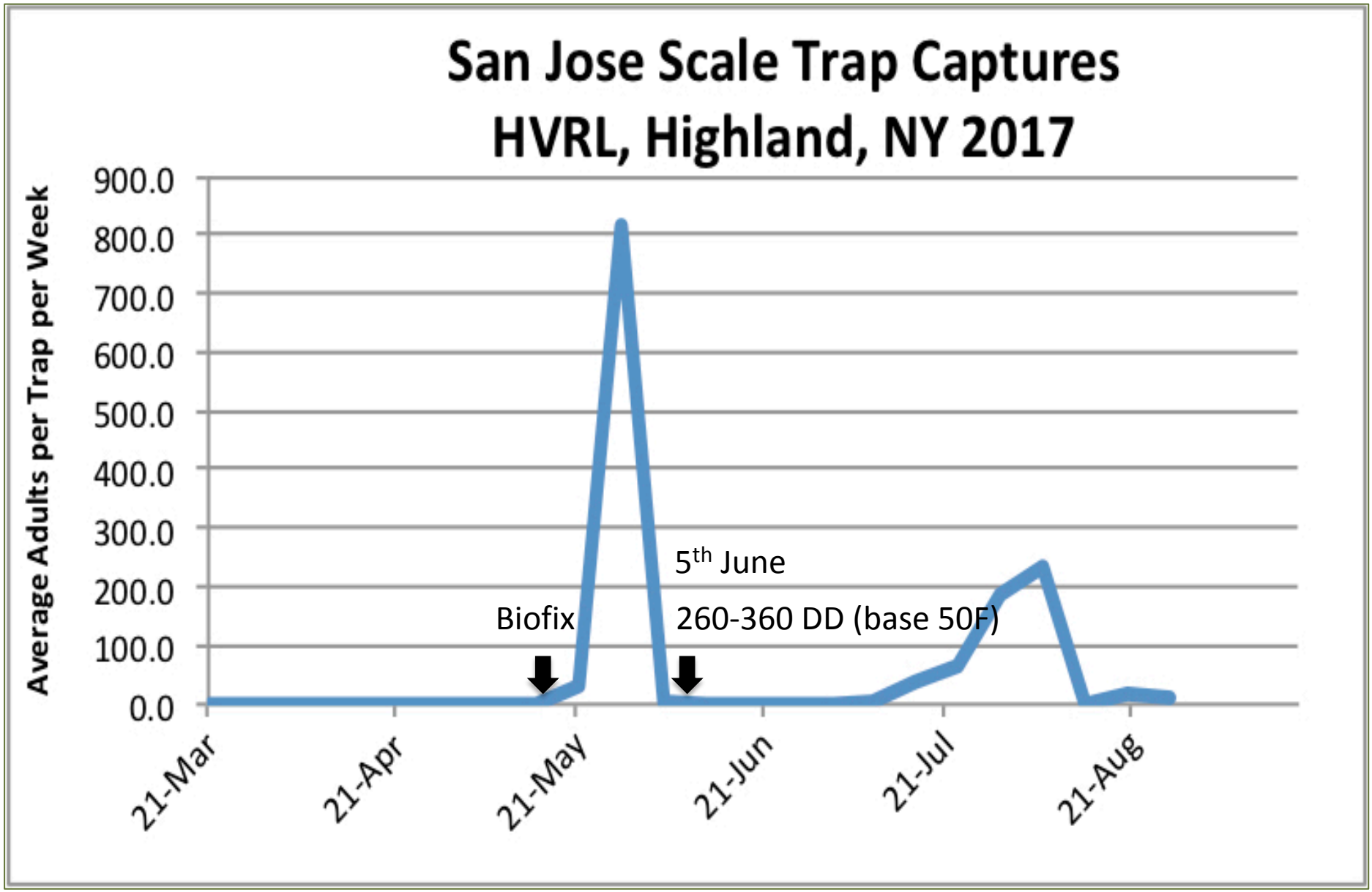
- = Unknown, unlabeled, or does not apply **0** = not effective **1** = poor **2** = fair **3** = good

San Jose Scale

- *OW on bark as 'black-cap'*
- *Does not lay eggs - produce live crawlers*
- *Crawler production by OW stage occurs 4-6 wk post bloom*
- *'white cap' → 'black cap' → adult*

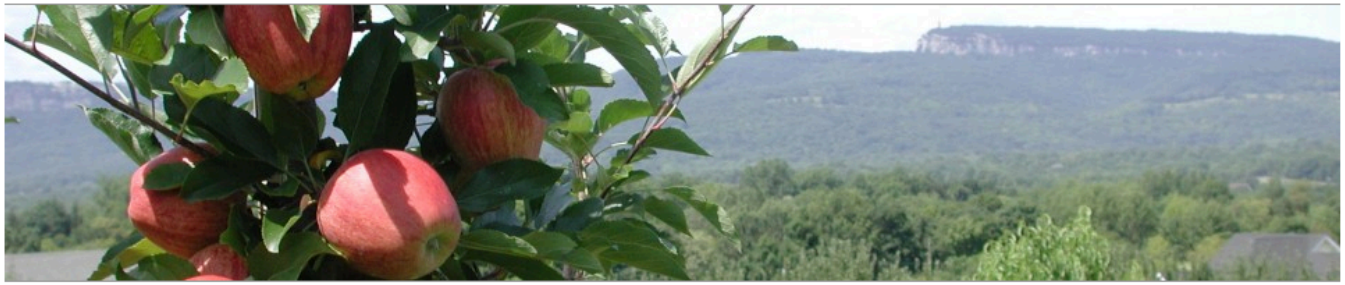


GT	TC	P	Bloom	PF	1C	2C	3C	4C	5C	6C	7C	8C
21 March	21 April	27 April	1 May	14 May	28 May	10 June	25 June	5 July	15 July	1 Aug.	15 Aug.	1 Sept.


San Jose Scale Trap Captures
HVRL, Highland, NY 2017
Average Adults per Trap per Week
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
21-Mar
21-Apr
21-May
21-Jun
21-Jul
21-Aug
Biofix
5th June
260-360 DD (base 50F)

THE JENTSCH LAB

INSECT BIOLOGY, ECOLOGY, AND MANAGEMENT IN HUDSON VALLEY AGRICULTURAL COMMODITIES



← ARRIVAL: CODLING MOTH EMERGENCE IN THE MID-HUDSON VALLEY

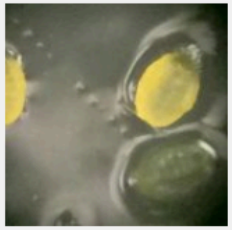
SCALE EMERGENCE UPDATE. CRAWLER DEVELOPMENT CONTINUING. NO OBSERVATION OF EMERGENCE TO DATE →

Taking Flight: SJS and OBLR Management As We Near 1st Emergence

by PETER J JENTSCH posted on JUNE 1, 2018 [EDIT]

Brief:

San Jose Scale (SJS) have been on the wing since the 18th of May. **We expect crawlers to emerge in southern sites beginning on the 5th of June.** Management for SJS include contact insecticides directed against the emerging crawlers can be found in a prior post (linked here). Black electrical tape on infested limbs with a thin coating of Vaseline will capture emerging nymphs and provide precise emergence timing for insecticide application.



SJS 2ND GEN. NYMPHS ON BLACK ELECTRICAL TAPE (2017)

Obliquebanded leafroller (OBLR): We are also at the period of the season when obliquebanded leafroller (OBLR) adults are beginning to emerge and are now in flight with first trap captures in Milton and Walden. They will soon begin their egg laying in earnest next week with egg hatch not too far behind. **Based on NOAA weather forecasts, predicted emergence date for the 1st generation OBLR larva is the 16th of June.**

Search

2017 BLOG PAGES

- Last chance sign up today (or walk-in tomorrow) for the 'Pre-Bloom Decision Making for Your Orchard' Workshop.....This Friday, March 8th, 2019, From 2-5 PM; Free for HVRL members! March 7, 2019
- Sign up today for the 'Pre-Bloom Decision Making for Your Orchard' Workshop.....This Friday, March 8th, 2019, From 2-5 PM; Free for HVRL members! March 4, 2019
- Workshop Announcement: 'Pre-Bloom Decision Making for Your Orchard' Friday March 8th 2019, 2-5PM; HVRL February 22, 2019

SURROUND WP INEFFECTIVE AT MANAGING SJS.

The Cornell fact sheet describes in depth San Jose Scale life cycle and biology.

San Jose scale	1B	*Imidan 70W	2.13-5.75 lb/acre 0.75-1.0 lb/100 gal water	7	96	Moderate	[29.4]
	4A	*Admire Pro 4.6SC	2.8 fl.oz./acre	7	12	Moderate	[29.4]
	4A	Assail 30SG	8 oz/acre	7	12	Moderate	[29.4,29.4a]
	7C	Esteem 35WP	4-5 oz/acre	45	12	High	[29.4]
	9C	Beleaf 50SG	2.8 oz/acre	21	12	Moderate	[29.4,29.4c]
	16	*†Centaur 0.7WDG	34.5 oz/acre	14	12	High	[29.3,29.4]
	23	Movento 240SC	6-9 fl.oz./acre	7	24	High	[29.4,29.4b]
	3A/28	*†Voliam Xpress	6-12 fl.oz./acre	21	24	High	[1.00]
	4A/3A	*†Endigo ZC	5-6 fl.oz./acre	35	24	Moderate	[1.00,15.4,29.4]
	4A/3A	*Leverage 360	2.4-2.8 fl.oz./acre	7	12	Moderate	[1.00,29.4]

CORNELL GUIDELINES FOR SJS MGT.

San Jose Scale

Pre-Bloom

*Oil - alone
*Esteem (w/o oil)
*Centuar (w oil)

1C & 3C

*Movento + 0.25% NIS (LI700; oil…)

Crawler Stages

(2 appls. @ 3-4C; 2 appls @ 5-6C)

*Admire Pro 4.6SC at (2.8 fl.oz./A) a feeding toxicant,
*Assail 30SG (8.0 oz./A) a translaminar feeding and contact
*Centaur 0.7WDG (34.5 oz./A) IGR
*Esteem 35WP (4-5 oz./A) IGR
*Imidan 70WP 70WS (2.13-5.75 lb./A), contact insecticide

Pre-mix insecticides: contact and feeding activity

*Endigo ZC (5-6 fl.oz./A),
*Leverage 360 (2.4-2.8 fl.oz./A)
*Voliam Xpress EC (6-12 fl.oz./A)

Pre-bloom - San Jose scale

Evaluation of insecticides for controlling San Jose scale on apple, N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-2005

% mortality per # of days post application

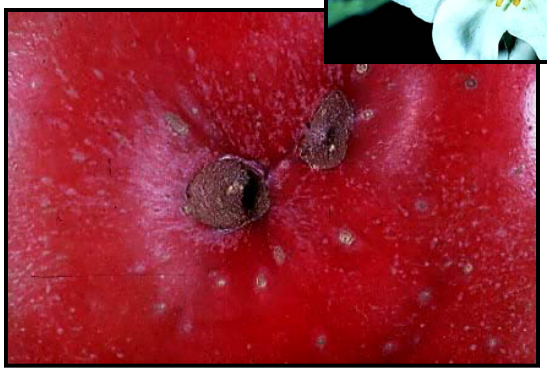
Treatment	Quantity	Timing	7 d	14 d	21 d	28 d	45 d
1. Damoil	3.0 gal. / 100	GT	100.0 c	100.0 c	100.0 c	100.0 c	100.0 c
2. Damoil	2.0 gal. / 100	HIG	100.0 c	100.0 c	100.0 c	100.0 c	100.0 c
3. Lorsban	1.0 pt. / 100	HIG	100.0 c	100.0 c	100.0 c	100.0 c	100.0 c
4. Esteem	1.25 oz./ 100	HIG	48.5 b	41.3 b	37.5 a	51.4 b	59.4 b
5. Assail	1.25 oz./ 100	HIG	51.6 b	44.6 b	78.4 b	94.1 c	99.9 c
9. Untreated	-	-	2.7 a	23.0 a	37.5 a	36.0 a	34.9 a

Pre-bloom - San Jose scale

Evaluation of insecticides for controlling San Jose scale on apple, N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-2005

Treatment	Formulation amt./100 gal.	Timing	% infested Fruit	Ave. # caps / Fruit	Live SJS caps / Fruit
1. Damoil	3.0 gal.	GT	0.0 a	0.0 a	0.3 a
2. Damoil	2.0 gal.	HIG	0.9 a	0.3 ab	1.3 a
3. Lorsban	1.0 pt.	HIG	3.0 ab	1.5 ab	1.2 a
4. Esteem	1.25 oz.	HIG	1.4 ab	1.3 ab	2.6 a
5. Assail	1.25 oz.	HIG	31.2 bc	29.6 cd	6.9 ab
9. Untreated	-	-	95.9 d	277.0 d	142.2 c

Tarnished Plant Bug - Management

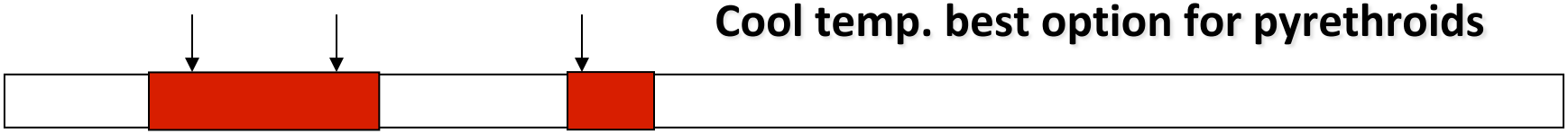


Begin scouting at tight cluster *and* note observation of TPB activity.

Treatment for TPB should be considered during periods of increasing and prolonged temperatures above 65°F.

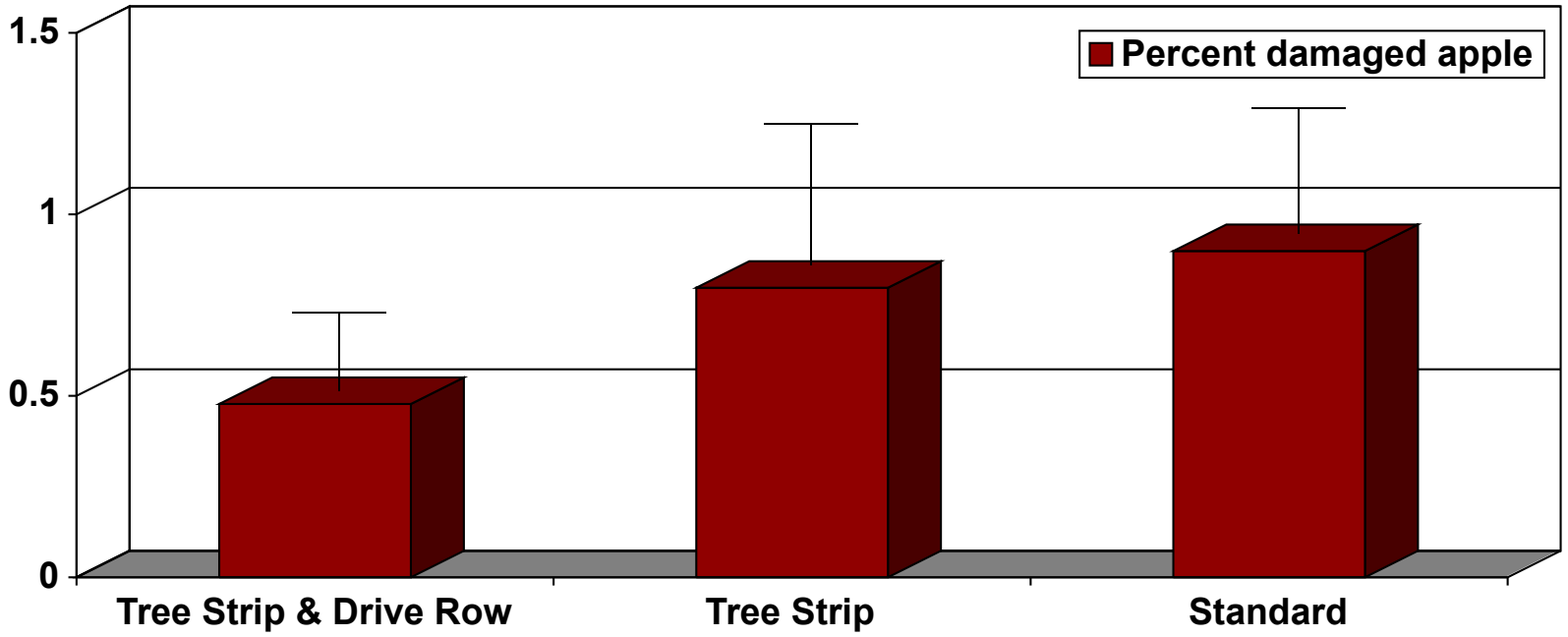
Neonicotinoids - Assail
(Calypso - registration.)
Excellent choice for T.pyri mgt.

Cool temp. best option for pyrethroids



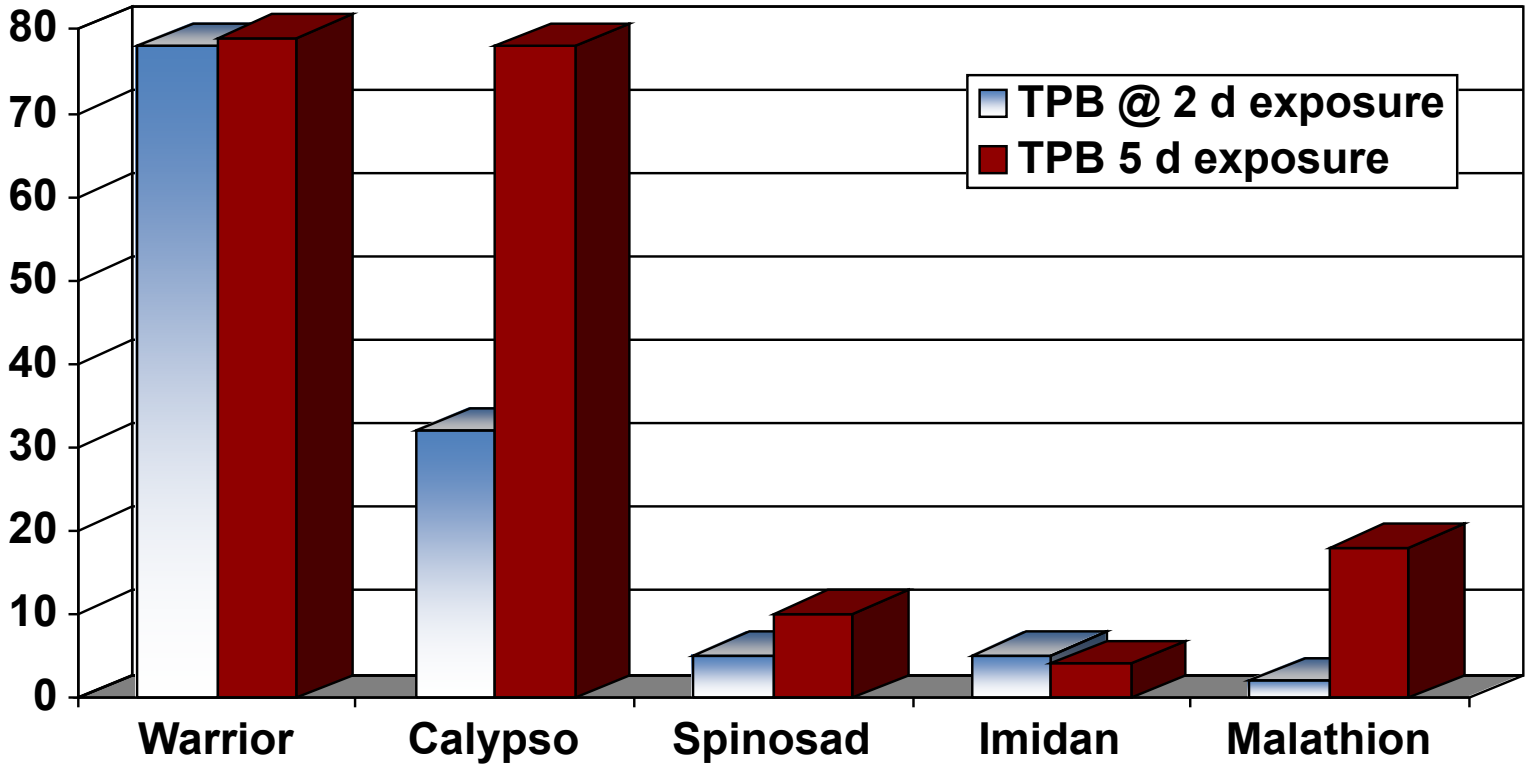
GT	TC	P	Bloom	PF	1C	2C	3C	4C	5C	6C	7C	8C
21 March	21 April	27 April	1 May	14 May	28 May	10 June	25 June	5 July	15 July	1 Aug.	15 Aug.	1 Sept.

Percent of Apples at Harvest Injured by Tarnished Plant Bug in Three Types of Groundcover Plots.



* Hardman et al., Kentville N.S. Canada 2002

Efficacy of Insecticides on TPB placed on apple 6d post application



* Hardman et al., Kentville N.S. Canada 2002

Effects of Pre-bloom Applications on TPB Damage on Apple
Cornell's Hudson Valley Lab - 2005

Treatment	Rate	Timing	% TPB Fruit Damage
Calypso	4.0 oz. /A	LTC	0.1 a
Calypso	6.0 oz. /A	P	2.5 bcde
Assail 70WP	2.5 oz./A	LTC	0.8 abc
Untreated	-	-	3.3 cde

Late tight-cluster (LTC) on 22 April

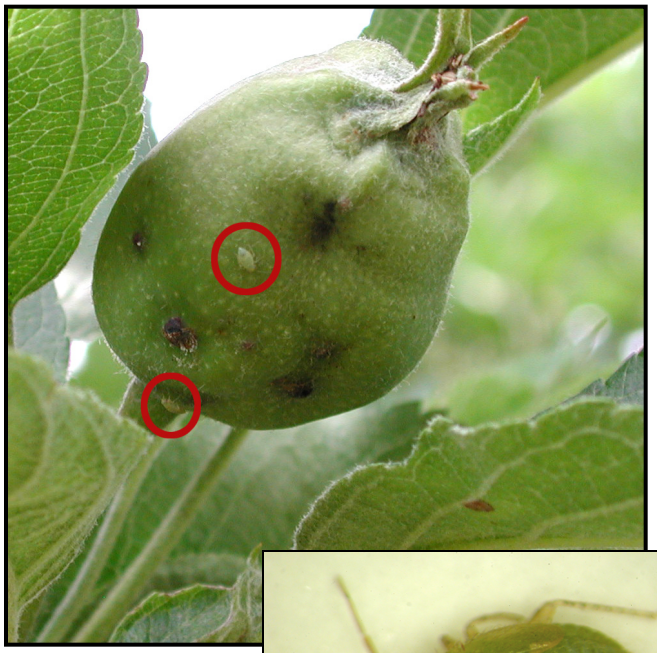
Pink (P) on 26 April

Effects of Pre-bloom Applications on TPB Damage on Apple
Cornell's Hudson Valley Lab - 2003

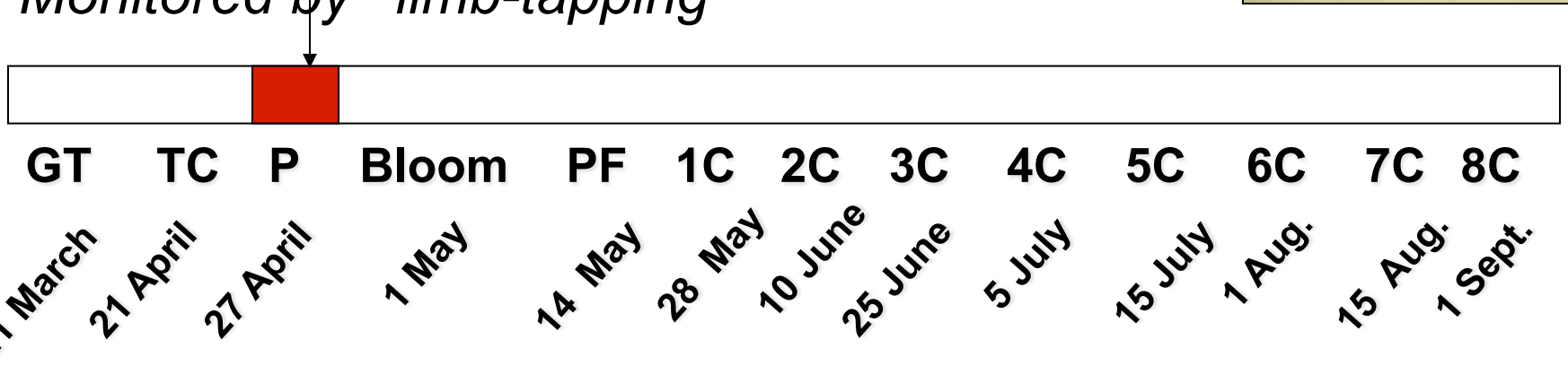
Treatment	Rate	Timing	% TPB Fruit Damage
Asana XL	5.8 oz. /100	TC, P	0.0 a
Warrior ZT	1.7 oz. /100	TC	1.1 bcd
Assail 70WP	1.1 oz./100	TC	0.4 abc
Actara 25WP	1.7 oz./100	TC	0.2 abc
Calypso	1.0 oz. /100	P	3.5 de
Untreated	-	-	3.3 cde

Late tight-cluster (LTC) on 25 April
Pink (P) on 29 April

Mullen Plant Bug (MPB)



- Pre-bloom management
- *OW as eggs under bark*
- *Peak hatch at full bloom, completed by petal fall*
- *Nymphs are mite egg predators (Beneficial)*
- *Monitored by 'limb-tapping'*



Mullen Plant Bug

Hudson Valley Observations:

- 2004 Pest - Fruit damage
- 2005 Beneficial - mite reduction

Red Delicious. Ardonia, NY 2004

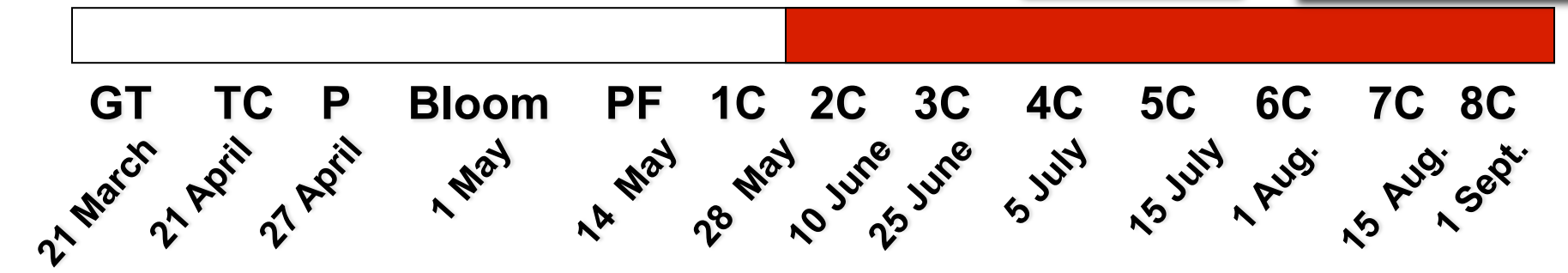
Susceptible varieties:
Empire, Red & Golden Delicious, Sparten, Northern Spy.

<u>Late pink application.</u>

Lorsban 4E	1.5 qt./100
Actara 25WDG	4.5 oz./A.
Assail 70WP	1.7-3.4 oz./A.
Warrior 1CS	2.6-5.1 fl oz/A.
Asana XL 0.66EC	2.0-5.8 oz./100 gal

Wooly Apple Aphid (WAA)

- Sporadic pest on apple & pear; infesting fruit
- *Wingless females produce live young on apple*
- Nymphs undergo 4 instars, crawlers carried by wind from tree to tree.
- Establish root colonies of susceptible rootstock (M.9, M.26…)
- Parasitized by *Aphelinus mali*



Wooly Apple Aphid (WAA)

Beers, E.H.,Talley, R.R, WA State, 2008

WAA colonies/1.5 min search

Treatment	Rate/acre	5-Aug	11-Aug	18-Aug	26-Aug	2-Sep	11-Sep
Pyrifluquinazon 15EC	**27 fl oz**	**37a**	**40abc**	**54b**	**43ab**	**135abc**	**186bc**
Tolfenpyrad 20SC	**3.19 fl oz**	**53a**	**50abc**	**69ab**	**58b**	**93c**	**114cd**
BeLeaf 50SG	**5 oz**	**34a**	**29bc**	**59ab**	**62ab**	**117bc**	**147c**
Diazinon 50W	**4 lb**	**37a**	**5d**	**1d**	**4c**	**3d**	**6d**
Check ---		**42a**	**75a**	**98a**	**94a**	**277a**	**324a**

Means within columns not followed by the same letter are significantly different, Waller-Duncan *k*-ratio *t*-test, *k*-ratio=100.
Treatments applied **6 August**; Treatment 5 had a second application on **22 August**.
xData transformed log(x+0.5).
zTreatment included an adjuvant (Silwet, 0.025%).

Wooly Apple Aphid (WAA)

NY: Reissig, H. Combs, D., 2009

Material	Rate/A	Timing	% Term w/WAA colonies 16 July	4 August
Calypso 480SC + Movento 240SC[1]	4.0 fl oz 9.0 fl oz	PF	4.0a	10.7b
Movento 240SC[1]	9.0 fl oz	PF + 2C	1.7a	14.7b
Movento 240SC[1]	9.0 fl oz	2C	4.7a	23.3bc
Lorsban 75WG Movento 240SC[1]	1.5 lb 9.0 fl oz	TC 4C	6.7a	1.3a
Lorsban 75WG Esteem 35WP	1.5 lb 4.5 oz	TC 4 sprays	12.0ab	13.3b
Untreated Check			26.0b	41.3c

1. LI700 @ 0.5% v/v

Means within a column followed by the same letter are not significantly different (Fisher's Protected LSD Test, $P \leq 0.05$). Data were transformed arcsine (sqrt *x*) prior to analysis

Wooly Apple Aphid (WAA)

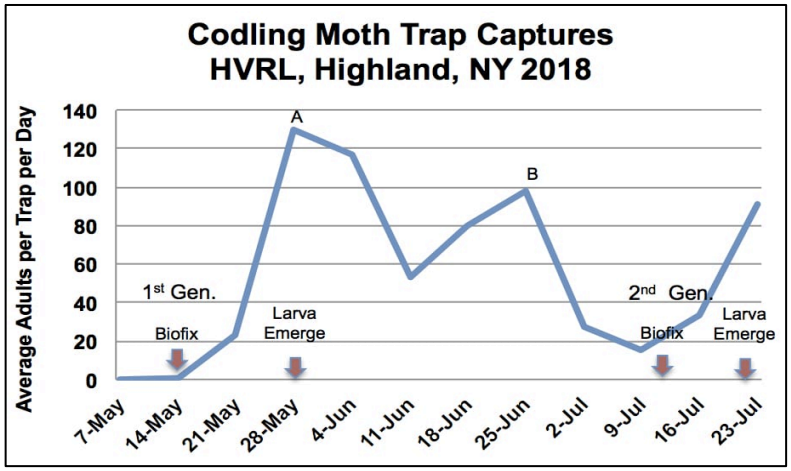
Wise, J. Mich. State, 2008

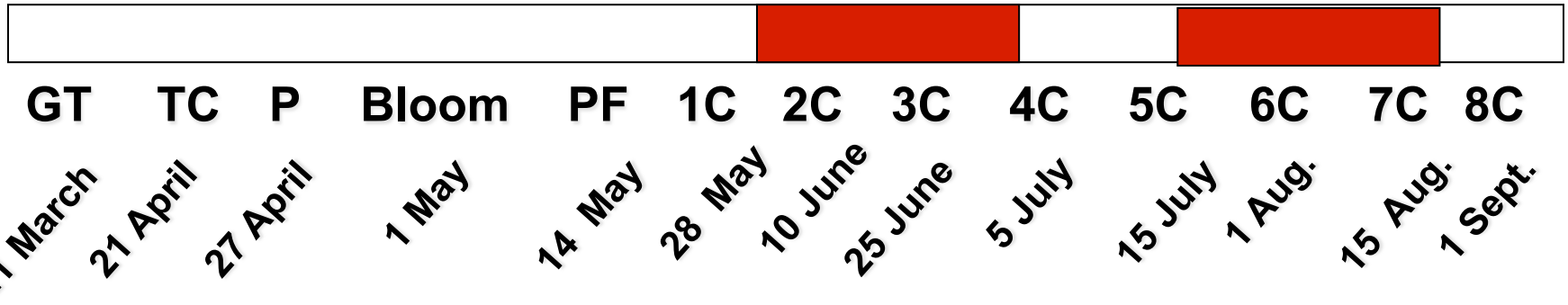
Material	Rate/A	Timing	% Survival w/WAA colonies 12 DAT	34 DAT
Movento 240SC Stl-tac	9.0 fl oz 1 % v/v	10 Sept.	3.3 b	0.0 a
Movento 240SC R-11	9.0 fl oz 0.25 % v/v	10 Sept.	6.7 b	0.0 a
Movento 240SC Damoil	9.0 fl oz 1 % v/v	10 Sept.	3.3 b	6.7 a
Provado 1.6F	8.0 fl oz	10 Sept.	6.7 b	3.3a
Thiodan 50WP	4.0 lb	10 Sept.	10.0 b	6.7 a
Untreated Check			80.0a	3.3a

Means within a column followed by the same letter are not significantly different (Fisher's Protected LSD Test, $P \leq 0.05$).
Data were transformed arcsine (sqrt *x*) prior to analysis

Codling Moth(CM)

- Endemic pest of pome fruit
- Causing severe injury to HV tree fruit
- Larva emerge at Biofix plus 220DD$_{50}$
- NEWA (http://newa.cornell.edu)





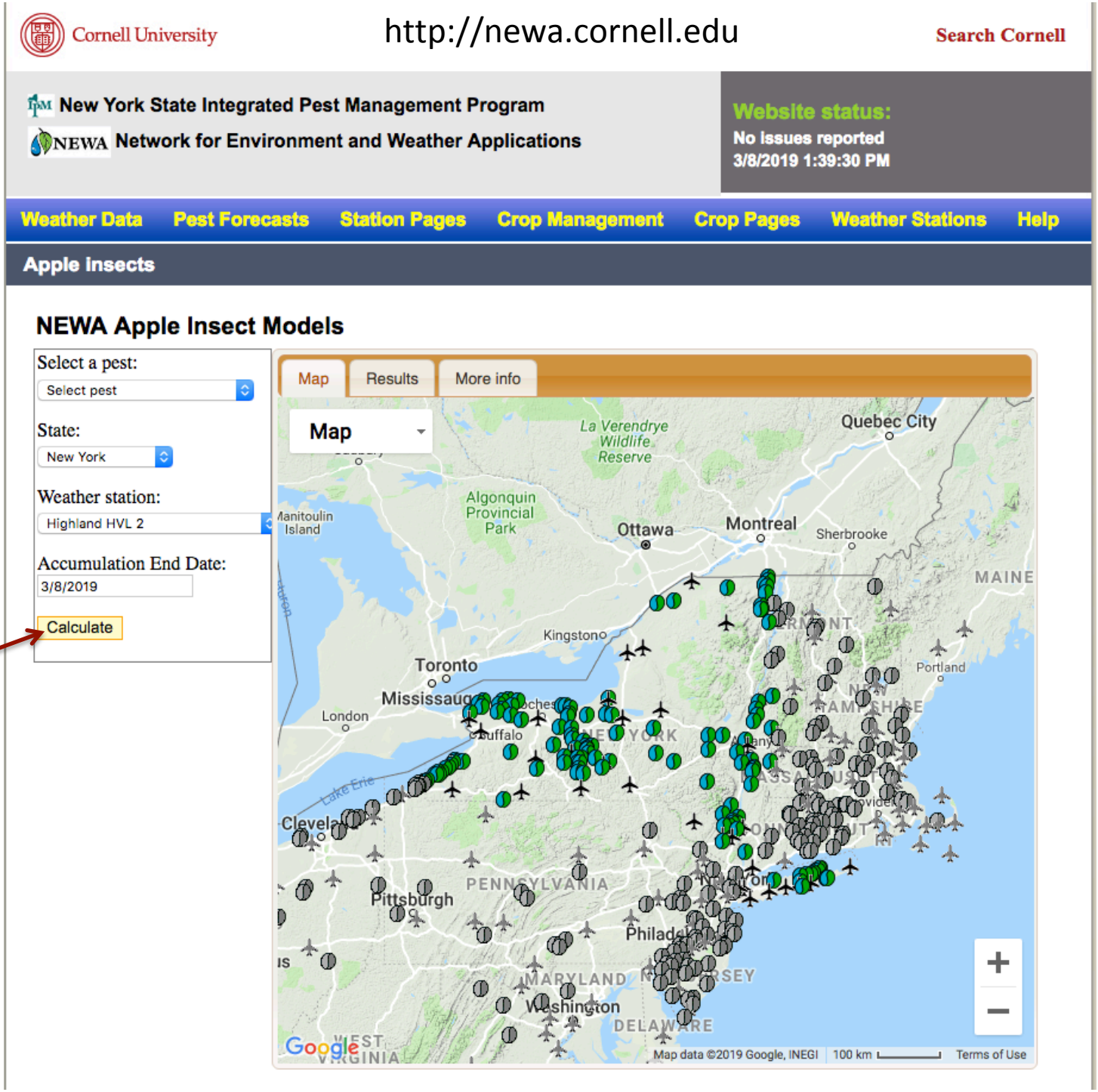
Insect species

State

Weather Station

Date

Enter



Insect species

State

Weather Station

Date

First sustained trap capture

Insect status

Cornell University

http://newa.cornell.edu

Search Cornell

New York State Integrated Pest Management Program

NEWA Network for Environment and Weather Applications

Website status:
No issues reported
3/8/2019 1:31:36 PM

Weather Data | Pest Forecasts | Station Pages | Crop Management | Crop Pages | Weather Stations | Help

Highland HVL 2

NEWA Apple Insect Models

Select a pest: Codling Moth

State: New York

Weather station: Highland HVL 2

Accumulation End Date: 05/29/2018

Calculate

Map | Results | More info

Codling Moth Results for Highland HVL 2

First Trap Catch: 5/24/2018

First Trap Catch date above is estimated based on degree day accumulations or user input. Enter the actual date for blocks of interest and the model will calculate the protection period after first trap catch more accurately.

Accumulated degree days (base 50°F) first trap catch through 5/29/2018: 121 (0 days missing)

	Past	Past	Current	Ensuing 5 Days			
Date	May 27	May 28	May 29	May 30	May 31	Jun 1	Jun 2	Jun 3
Daily Degree Days (Base 50BE)	14	11	26	23	16	26	23	12
Accumulation since January 1	482	493	519	542	558	584	606	618

Show Degree Day Graph

Pest stage: Moths flying & first eggs laid

The pest stage above is estimated. Select the actual stage and the model will recalculate recommendations.

Pest Status	Pest Management
First eggs are laid at about 50 DD and the first eggs usually hatch after about 220 DD.	Apply insecticides that need to be present before egg laying at about 50-75 DD. Apply insecticides that target early egg laying period at 100-200 DD. Pesticide information

Disclaimer: ***These are theoretical predictions and forecasts.*** *The theoretical models predicting pest development or disease risk use the weather data collected (or forecasted) from the weather station location. These results should not be substituted for actual observations of plant growth stage, pest*

Back to Highland HVL 2 Weather Station Page

Management Tools for Codling Moth and Obliquebanded Leafroller

With Highest Degree of Efficacy

CM		OBLR:	
Lannate 90SP	0.5-1 lb/acre	Entrust 2SP	6-10 fl oz/acre
Lannate LV 2.4L	1.5-3 pts/acre	Entrust 80 WP	2-3 oz/acre
Imidan 70W	2.13-5.75 lb/acre	Proclaim 5SG	3.2-4.8 oz/acre
Assail 30SG	4-8 oz/acre	Dipel 10.3DF	0.5-2 lb/acre
		Intrepid 2F	8-16 oz/acre
Delegate 25WG	**4.5-7 oz/acre**	**Delegate 25WG**	**4.5-7 oz/acre**
Altacor 35WDG	**2.5-4.5 oz/acre**	**Altacor 35WDG**	**2.5-4.5 oz/acre**
Exirel	**8.5-17 fl oz/acre**	**Exirel**	**8.5-17 fl oz/acre**
Besiege	**6-12 fl oz/acre**	**Besiege**	**6-12 fl oz/acre**
Leverage 360	**2.4-2.8 fl oz/acre**		
Voliam Flexi WDG	**4-7 oz/acre**	**Voliam Flexi WDG**	**4-7 oz/acre**
Minecto Pro	**8.0-12.0 fl oz/acre**	**Minecto Pro**	**8.0-12.0 fl oz/acre**

Conclusions

- Key pests such as codling moth are causing increasing injury to fruit

  Resistance management through rotation of insecticides is critical

  Insecticide efficacy (Altacor) for 1st generation emergence
  Delegate / Exirel / (Not Besiege)

  Timing at first hatch of CM also critical

Use of traps, monitoring and models becoming more important in narrow spectrum insecticides.

Changes in production technologies will be soon coming and dramatic