Pesticide Applicator Training Program:

Vegetable & Fruit Insect Management News






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THE OHIO STATE UNIVERSITY

Topics

- Insecticide product news
- Insect pests of concern

New insecticide: Harvanta

- A.I.: cyclaniliprole
- IRAC group 28 (diamides)
  - Related to Altacor & Coragen
- Formulation: 50SL
- 50 grams/liter = 0.42 lb a.i./gal
- By Summit Agro USA
- Federal label: September 2017

Harvanta

Crop	Pre-harvest interval (PHI), in days	Target
Leafy veg.	1	caterpillars, flea beetles, dipteran leafminers, pepper weevil, cucumber beetle, some thrips, some aphids
Brassica veg.	1	
Fruiting veg.	1	
Cucurbits	1	

Re-entry interval (REI): 4 hours
Limit 4 applications at high rate
Limit 6 applications at low rate

New insecticide: BeetleGONE!

- **A.I.: *Bacillus thuringiensis galleriae***
- **By Phyllom BioProducts**
- **Targets adults of:**
  - Japanese beetle
  - Green June beetle
  - Asiatic garden beetle
  - strawberry root weevil
  - pepper weevil


C. Welty


Emmy Engasser, Hawaiian Scarab ID, USDA APHIS ITP, Bugwood.org


Emmy Engasser, Hawaiian Scarab ID, USDA APHIS ITP, Bugwood.org


Steve Nanz, via BugGuide.net


Pest and Diseases Image Library, Bugwood.org

New insecticide: BeetleGONE!

- Allowed on all fruit & veg crops
- 0-day pre-harvest interval
- 4-hour re-entry interval
- Allowed for organic production
- Beware, short residual activity

New insecticide: Trident

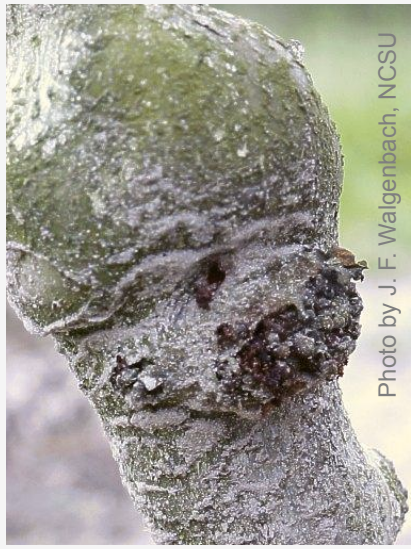
- A.I.: *Bacillus thuringiensis tenebrionis*
- Same a.i. as previous M-One & Novodor
- Targets Colorado potato beetle
- Most toxic to young larvae
- Treated leaves must be ingested
- Need thorough coverage
- Use on potato, eggplant, tomato

New insecticide: Trident

- A.I.: *Bacillus thuringiensis tenebrionis*
- By Certis
- IRAC group 11A
- 0-day pre-harvest interval
- 4-hour re-entry interval
- On OMRI list for organic production

Mating disruption product:

Isomate-DWB



- For dogwood borer on apples
- 100 - 200 dispensers / acre
- Start: 150 dispensers / acre
- Place at chest height
- Apply in spring, by end May
- Lasts full season (~ 4 months)

New uses: Exirel & Verimark

- a.i. = cyantraniliprole
- group 28, with Coragen & Altacor
- Exirel: foliar
- Verimark: soil

New uses: Exirel

Crops:

- potatoes & other tubers
- snap beans & other legumes
- radish, carrot, other root veg.
- greenhouse cucumbers
- strawberries

Pests:

- caterpillars
- aphids
- flea beetles
- whiteflies
- leafminers
- Colorado potato beetle
- thrips
- Japanese beetle
- plum curculio

New uses: Verimark

Crops:

- green onion, bulb onion & other bulb vegetables
- snap beans & other legume vegetables
- radish, carrot & other root vegetables

Pests:

- caterpillars
- leafminers
- whiteflies
- aphids
- thrips

New uses: Agri-Mek SC

for mite & leafminer control

New crops	Pre-harvest interval (PHI), in days
Caneberries	7
Sweet corn	7
Succulent beans	7
Greenhouse tomato	1
Green onions	7

New uses: Agri-Mek

- **Agri-Mek SC**
  - Supplemental label:
    - Broad mite on caneberries
- **Agri-Mek 0.15EC**
  - Now allowed on all stone fruit (21 day PHI)
- **Beware difference in labels of Agri-Mek SC & Agri-Mek 0.15EC**

Revised uses: Belay

- No longer for tomato, peppers, eggplant, other fruiting veg.
- For cucurbits:
  - Do not apply after 4th true leaf on main stem is unfolded
- For potato:
  - Do not apply between 50% row closure and petal fall
  - Do not make more than 1 application / year prior to 50% row closure
- For grapes:
  - New limit of 1 application/year

Closer & Transform

- **Re-established October 2016**
  - –Registered 2013
  - –cancelled November 2015
- **A.I.: sulfoxaflor**
- **IRAC group 4C:**
  - –'cousins' of neonicotinoids (4A)
  - –different subgroup than Admire (4A)
- **plant bugs, aphids, leafhoppers, whiteflies**

Cancellation: flubendiamide

- flubendiamide
  - Belt SC, made by Bayer
  - Synapse WG, made by Bayer
- flubendiamide + buprofezin
  - Tourismo, made by Nichino
- cancelled August 2016
- distributors can sell inventory
- growers can use product per label

Phase-out of endosulfan (Thionex)

Final use date	*Crop*
7/31/2012	cukes, melons, summer squash, eggplant, cabbage+, kale+, lettuce, peach, plum, cherry, strawberry (annual)
7/31/2013	pear
7/31/2015	pumpkin, winter squash, tomato, pepper, potato, sweet corn, apple, blueberry
7/31/2016	strawberry (perennial)

Pollinator Protection:

new bee advisory box on some labels

PROTECTION OF POLLINATORS

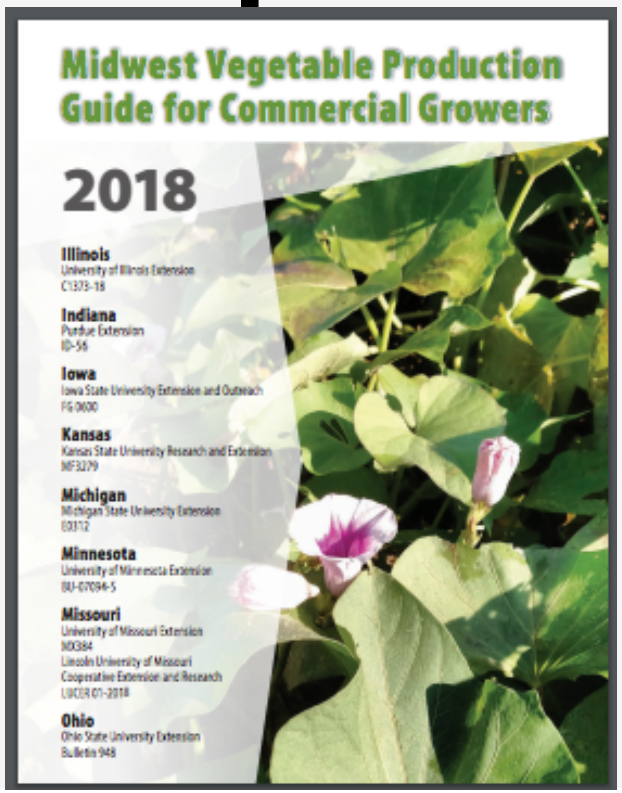
APPLICATION RESTRICTIONS EXIST FOR THIS PRODUCT BECAUSE OF RISK TO BEES AND OTHER INSECT POLLINATORS. FOLLOW APPLICATION RESTRICTIONS FOUND IN THE DIRECTIONS FOR USE TO PROTECT POLLINATORS.

Look for the bee hazard icon in the Directions for Use for each application site for specific use restrictions and instructions to protect bees and other insect pollinators.

This product can kill bees and other insect pollinators

- **Now on labels of neo-nics (Belay, Actara, Admire, Venom, Scorpion) & Exirel**

these & other changes put in 2018 production guides



Pests of current interest

Old	Japanese beetle 
Recent	silverleaf whitefly 
	pepper weevil 
	black stem borer 
	spotted wing drosophila 
	brown marmorated stink bug 
Potential	spotted lanternfly 

Japanese beetle

- Extra abundant in 2017
- Raspberry, peach, plum, grape, soybean, corn
- Good control from 2 old products:
  - carbaryl (Sevin)
  - pyrethrins + PBO (EverGreen EC 60-6)
- Control as soon as they arrive

Whiteflies: several species

- **Greenhouse whitefly**
  - Less common than past
- **Banded-wing whitefly**
  - Common outdoor species
  - Susceptible to insecticides
- **Silverleaf whitefly**
  - Now common in greenhouses
  - Resistant to many insecticides

Silverleaf whitefly

(also known as sweetpotato whitefly)

- **Common greenhouse pest**
- **Abundant outdoors in 2017**

tomato

squash

beans

lettuce

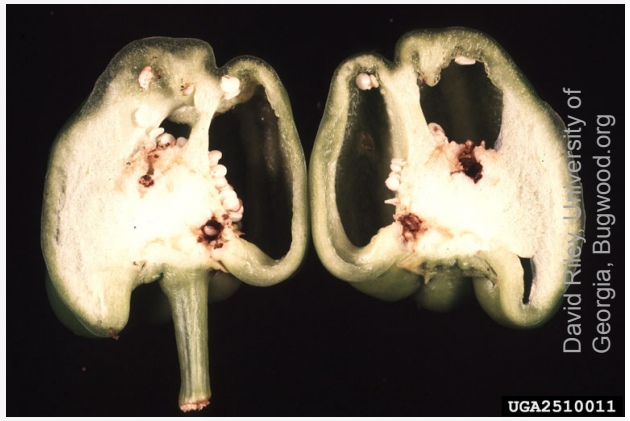
Silverleaf whitefly

- **Need magnifier to see immatures on underside of leaves**

Silverleaf whitefly

- **Damage:**
  - Leaf scorch
  - Sooty mold
- **Best controlled by neonicotinoids**
  - Assail
  - Venom

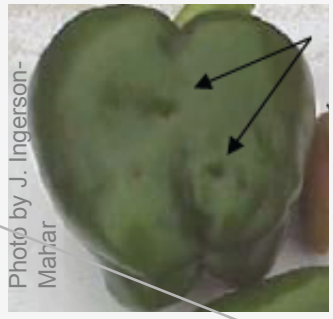
Pepper weevil

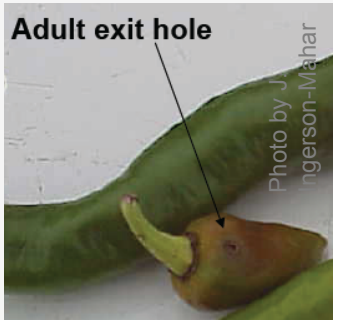


- **Serious pest of peppers**
- **Common in deep south**
- **Not tolerant of cold**
- **Recent outbreaks**
  - Ohio fields in 2015, 2016, 2017
  - Ontario greenhouses, since 2010
  - New Jersey fields, since 2004

Pepper weevil

- **Adult: small (3/16”) weevil**
- **Larvae: small grubs**
- **Symptoms:**
  - Small fallen fruit
  - Dimples from egg-laying
  - Small exit holes
- **Insecticides:**
  - Multiple applications
  - Assail, Actara, Vydate, Rimon





Pepper weevil in Ohio

- **Any sightings other than Celeryville (Huron County)?**
- **Please let us know!**
  - Your OSU county extension educator
  - OSU Dept. of Entomology

Black stem borer

***Xylosandrus germanus,* an ambrosia beetle**

Pennsylvania Department of Conservation and Natural Resources - Forestry , Bugwood.org

- **In USA since 1932**
- **Attack apple trees under stress**
  - Extreme winter cold
  - Flooding or drought
- **In nursery or orchard**
- **Symptoms**
  - Bark discolored, peeling or blistering
  - 'Toothpicks' of frass tubes on trunk
  - Wilting, death

Photograph by Russ F. Mizell, University of Florida

Black stem borer: management

- **Diagnose & relieve the stress**
- **Insecticide**
  - Preventive, not curative
  - Apply permethrin to bark in May

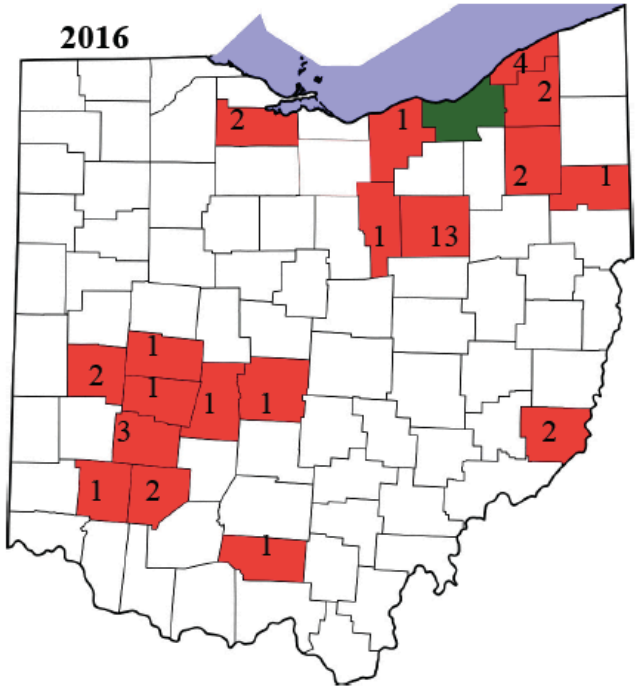
A new pest of fruit crops in Ohio:
Spotted wing Drosophila

- **The new species attacks <u>healthy</u> ripening fruit**
- **Similar to common vinegar flies on over-ripe, decaying fruit**
- **Larvae feed inside fruit**
- **In Ohio since 2011**

Fruit injury by Spotted wing Drosophila

Spotted wing Drosophila in Ohio

- **Bad news**
  - Widespread
  - Severe damage
- **Good news**
  - Under control if insecticide program used
  - **Traps*** help determine need
  - **Salt water test*** helps determine control success



* Details on website: u.osu.edu/pestmanagement/

Insecticide choices for SWD

Category	*Product*
Most effective	a diamide: Exirel
	spinosyns: Delegate, Radiant Entrust [OMRI]
	organophosphates: Imidan, Diazinon, Malathion
	pyrethroids: Mustang Maxx, Brigade, Pounce, Hero, Danitol, Baythroid, Warrior, Asana
	a carbamate: Lannate
Moderately effective	a neonicotinoid: Assail a carbamate: Sevin
Slightly eff.	Grandevo, Pyganic [OMRI]

Insecticide choices

- **Beware:**
  Each product on each crop:
  - **Different PHI**
  - **Different number of applications allowed**

Chart for SWD on all fruit crops

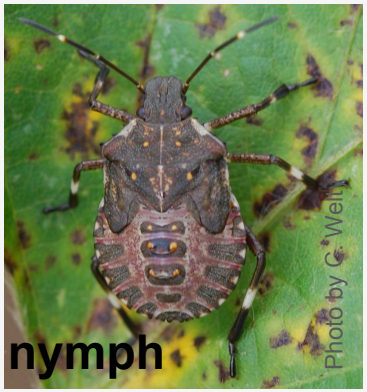
(u.osu.edu/pestmanagement/)

Efficacy on SWD	Mode of action group	Product	Residual activity (days)	Pre-harvest interval (PHI)						
				raspberry, blackberry	blue-berry	straw-berry	grape	cherry	peach	plum
Very effective	5	§ Delegate	5-7	1 day	3 days	X	7 days	7 days	14 days	7 days
	5	§ Radiant	5-7	X	X	1 day	X	X	X	X
	28	§ Exirel	5	X	3 days	1 day	X	3 days	3 days	3 days
	3A	! Mustang Max	7-10	1 day	1 day	X	1 day	14 days	14 days	14 days
	3A	! Brigade	7-10	3 days	1 day	0 days	30 days	X	X	X
	3A	! Hero	7-10	3 days	1 day	X	30 days	X	X	X
	3A	! Danitol	7-10	3 days	3 days	2 days	21 days	3 days	3 days	3 days
	3A	! Asana	7-10	7 days	14 days	X	X	14 days	14 days	14 days
	3A	! Baythroid	7-10	X	X	X	3 days	7 days	7 days	7 days
	3A	! Warrior	7-10	X	X	X	X	14 days	14 days	14 days
	3A	! Pounce	7-10	X	X	X	X	3 days	14 days	X
	1B	Imidan	7	X	3 days	X	14 days	7 days	14 days	7 days
	1B	!§ Diazinon	7	7 days	7 days	5 days	X	21 days	21 days	21 days
	1A	! Lannate	3-6	X	3 days	X	X	X	4 days	X
Effective	1B	Malathion	5-7	1 day	1 day	3 days	3 days	3 days	7 days	X
	5	Entrust [OMRI]	3-5	1 day	3 days	1 day	7 days	14 days	14 days	7 days
Moderately effective	1A	Sevin	10	7 days	7 days	7 days	7 days	3 days	3 days	3 days
	4A	§ Assail	1-3	1 day	1 day	1 day	3 days	7 days	7 days	7 days

Example: SWD on raspberries

- **Use traps for adults, check weekly**
- **If any SWD in traps:**
  - **Start spray program when berries color**
  - **Spray every 7 days until final harvest**
  - **Alternate:**
    - **Delegate (1-day PHI; 3 applications max)**
    - **Mustang Maxx (1-day PHI; 6 apps max)**
    - **Malathion (1-day PHI; 3 apps max)**
- **Do a salt test with ripe fruit, weekly**
  - **If find larvae: tighten to 5-day schedule**

Brown marmorated stink bug



- Attacks fruits & seed pods
- Invading Ohio since 2007

Brown marmorated stink bug: injury

Monitoring BMSB with traps

- **Improved lure by USDA-ARS**
  - **Double lure (2 pieces)**
    - ARS#20 (10 mg)
    - MDT (66 mg)
  - **Several companies:**
    - Trécé
    - AgBio
    - Alpha Scents
- **Trap**
  - **Standard: tall black pyramid**
  - **New: Clear sticky card**

Action threshold for BMSB on apples?

- Developed by USDA in WV
- Use 2 black pyramid traps:
  - 1 on edge
  - 1 in interior
- Track cumulative capture since last spray
- Threshold = average 10 adults per trap
- Once > threshold:
  - spray
  - re-set count to zero

Insecticides for stink bug

Product	Apple		Peach		Raspberry	
	PHI	Limit	PHI	Limit	PHI	Limit
Brigade	-	-	-	-	3	2 - 4 ap.
Venom, Scorpion	-	-	3	1 - 2 ap.	-	-
permethrin	Not after petal-fall	2 ap.	14	3 ap.	-	-
Baythroid	7	1 ap.	7	2 ap.	-	-
Belay	7	1 ap.	21	2 ap.	-	-
Lannate	14	5 ap.	4	6 ap.	-	-
Mustang Maxx	14	6 ap.	14	6 ap.	1	6 ap.
Assail	7	4 ap.	7	4 ap.	1	5 ap.
Warrior	21	5 ap.	14	5 ap.	-	-
Danitol	14	2 ap.	3	2 ap.	3	2 - 3 ap.
Actara	35	3 ap.	14	2 ap.	3	2 ap.

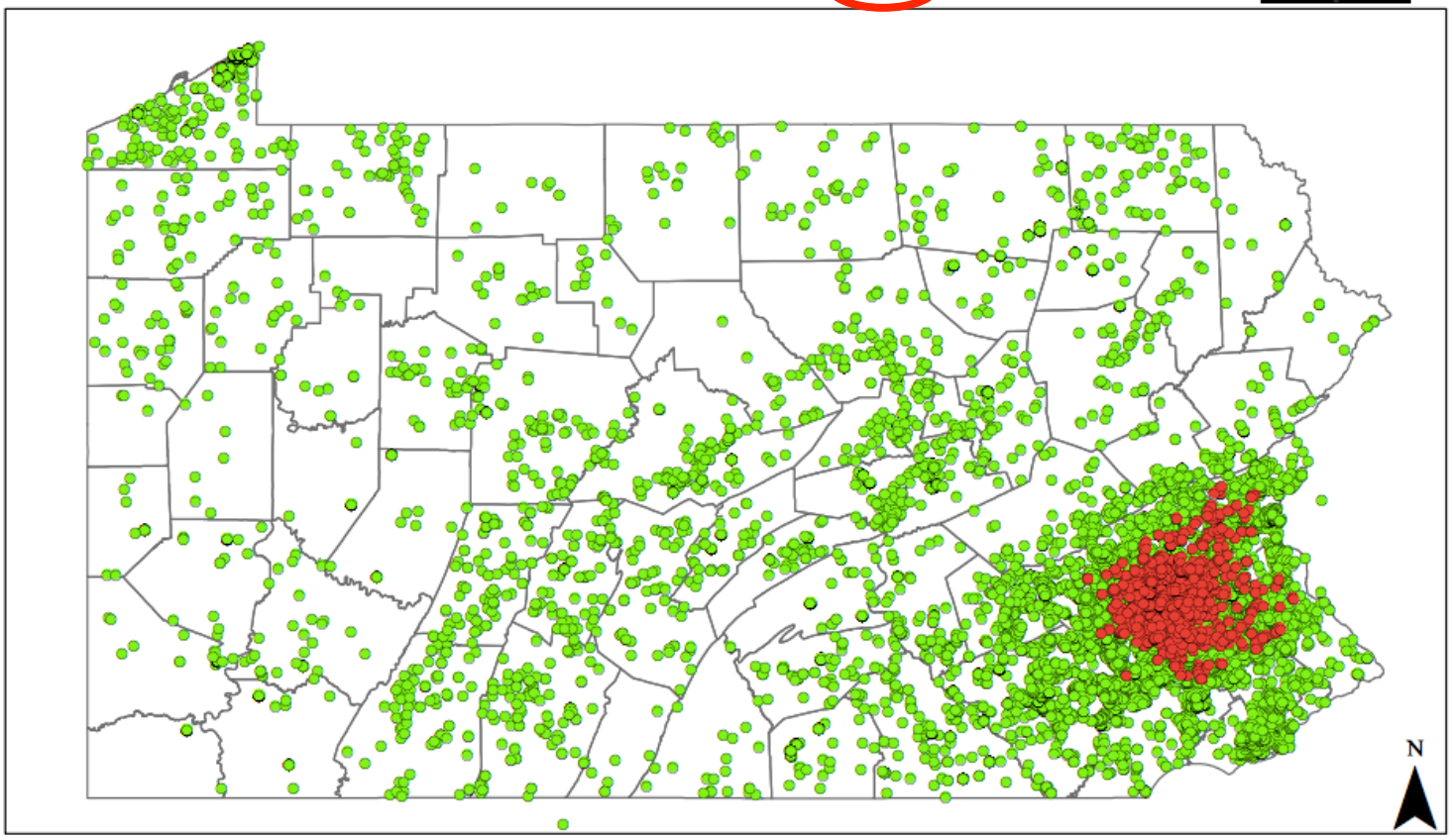
Potential pest of fruit crops in Ohio:

Spotted lanternfly

- **Found Sept. 2014, Berks Co., PA (NW of Philadelphia)**
- **Native to China**

2014 -- 2017 Lycorma Detection Survey

Results through 24 October 2017



Spotted Lanternfly Presence

- Positive
- Negative

pennsylvania
DEPARTMENT OF AGRICULTURE

Spotted lanternfly: spread?

- 1 find in State of Delaware, 11/20/2017
- 1 find in New York, 11/29/2017

Spotted lanternfly: hosts

- **Feeds on:**
  - Grape
  - Apple
  - Cherry
- **Key host in fall:**
  - Tree of Heaven
- **Congregate on trunk at base**

Spotted lanternfly

- A planthopper
- Sucks sap
- 1” long
- Poor flier
- Strong jumper

Lawrence Barringer, Pennsylvania Department of Agriculture, Bugwood.org

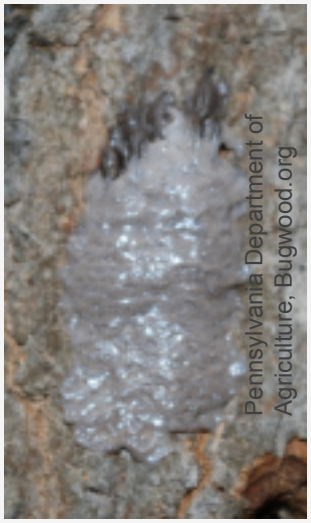
USGS Bee Inventory and Monitoring Lab, Beltsville, Maryland

Spotted lanternfly: damage

- Weeping wounds of sap on bark
- Excrete large amounts of fluid
- Mold grows on sweet fluid

Spotted lanternfly: egg masses

- **Laid in September**
- **New masses: gray**
- **Older masses: brown**
- **On trees, stones, furniture**



Spotted lanternfly: immatures

- **Young nymphs:**
  black with white spots

- **Older nymphs:**
  red with white spots

Spotted lanternfly: where to look?

- In evening or night: on trunk
- In day: at base of plant
- Eggs: on smooth surfaces (bark, brick, stone, dead plant tissue)

Spotted lanternfly: control?

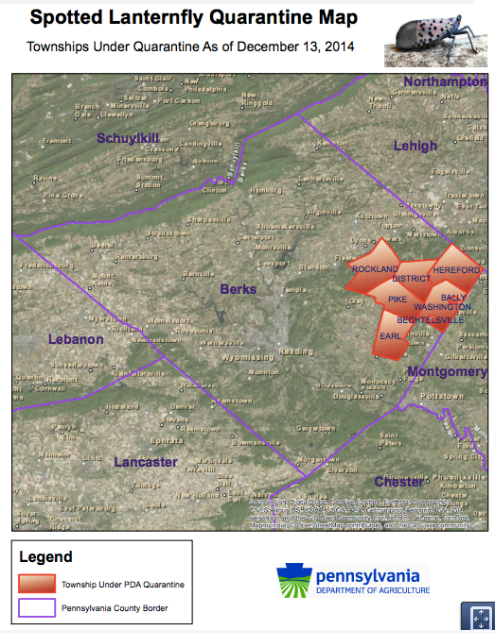
- Quarantine
- Egg mass scraping
  - 1,526,770 killed as of 5/2017
- Tree banding
  - Sticky bands to catch nymphs
  - 932,922 killed as of 8/2017

Spotted lanternfly: control?

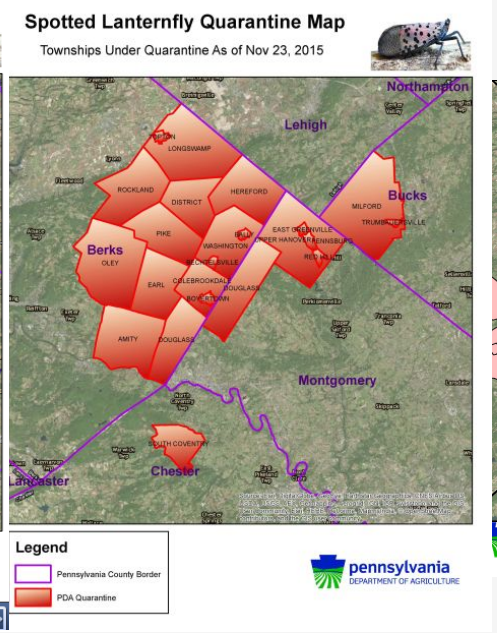
- **Insecticides**
  - **dinotefuran (Venom, Scorpion)**
  - **imidacloprid (Admire)**
  - **carbaryl (Sevin)**
  - **bifenthrin (Brigade)**

Quarantine for spotted lanternfly

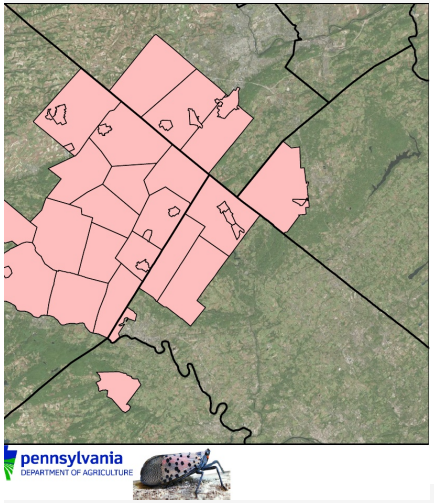
2014



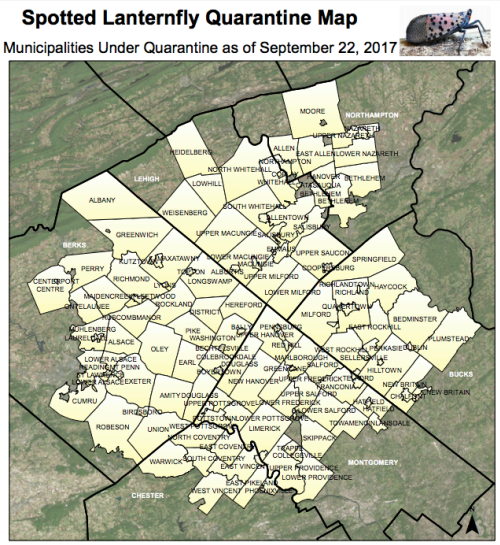
2015



2016



2017



Spotted lanternfly: Ohio?

- **Any sightings or suspicions?**
  - **Please let us know!**
  - **Your OSU county extension educator**
  - **OSU Dept. of Entomology**

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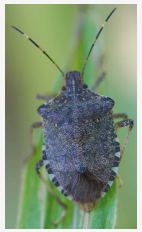

Info on fruit & veg. pests

u.osu.edu/pestmanagement/

Questions?

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