Pesticide Applicator Training Program:

Vegetable & Fruit Insect Management News




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November 2016

The Ohio State University

Topics

- **Insecticides**
  - New products
  - New uses
  - Cancelled products
- **Pests of concern**
- **Information resources**

Sivanto Prime

- A.I.: flupyradifurone
- IRAC group 4D (butenolides)
  - ‘cousin’ to neonicotinoids (4A)
- Systemic action
- Liquid: 1.67 lbs a.i./gal
- By Bayer
- Federal label: January 2015
- New uses: Sept. 2016

Sivanto: target pests

Veg:

- leafhoppers
- aphids
- whiteflies
- squash bug
- Colorado potato beetle

Fruit:

- leafhoppers
- aphids
- San Jose scale
- pear psylla
- vine mealybug
- blueberry thrips
- blueberry maggot

Sivanto: Pre-harvest interval

Crop	PHI (days)	
	foliar	soil
Brassica head & leafy	1	√
Cucurbits	1	21
Fruiting veg.	1	45
Leafy veg.	1	√
Legumes	7	-
Root veg.	7	-
Tuber/corm veg.	7	-

Sivanto: Pre-harvest interval

Crop	PHI (days)	
	foliar	soil
Blueberry	3	-
Strawberry	0	-
Grape	0	30
Apples, pears	14	-
Hops	21	-
Peaches	√	
Brambles	√	

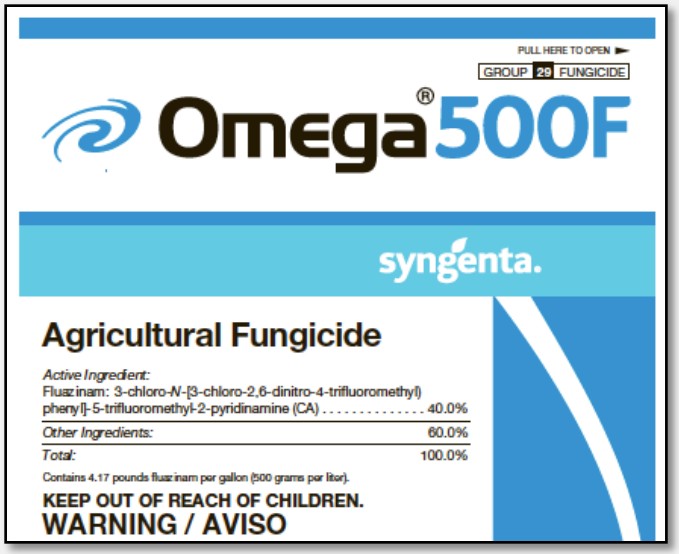
Closer & Transform

- **Re-established October 2016**
  - registered May 2013
  - suspended Sept. 2015
  - cancelled November 2015
- **A.I.: sulfoxaflor**
- **IRAC group 4C:**
  - **‘cousins’ of neonicotinoids (4A)**
  - **different subgroup than Admire**

sulfoxaflor

Product	Crop	Pest
Closer	pome fruit, stone fruit, grape, ~~strawberry~~, brassica leafy veg, ~~cucurbits,~~ fruiting veg, leafy veg, leaves of root/tuber crops	plant bugs aphids leafhoppers whiteflies
Transform	potato root/tuber (radish, beet, carrot) beans (succulent)	plant bugs aphids leafhoppers whiteflies

Omega



- fluazinam
- primarily a fungicide
- also kills spider mites
- apples: 28-day PHI
- by Syngenta

New uses

- **Portal XLO**
  - **Peach, potato, beans, cucumbers**
    - **On main label**
    - **No longer on supplemental label**

Products re-named

- Portal XLO
  - Replaced Portal 0.4EC
  - Same rates
- Sivanto Prime
  - Replaced Sivanto 200SL
  - Same rates

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**

Cancellation: Calypso 4F

- thiacloprid
- voluntary cancellation announced by Bayer, Dec. 2013
- state registrations being phased out
- still registered in Ohio for 2017
- growers can use product per label
  - Apple, pear
  - Stone fruit
  - Peppers

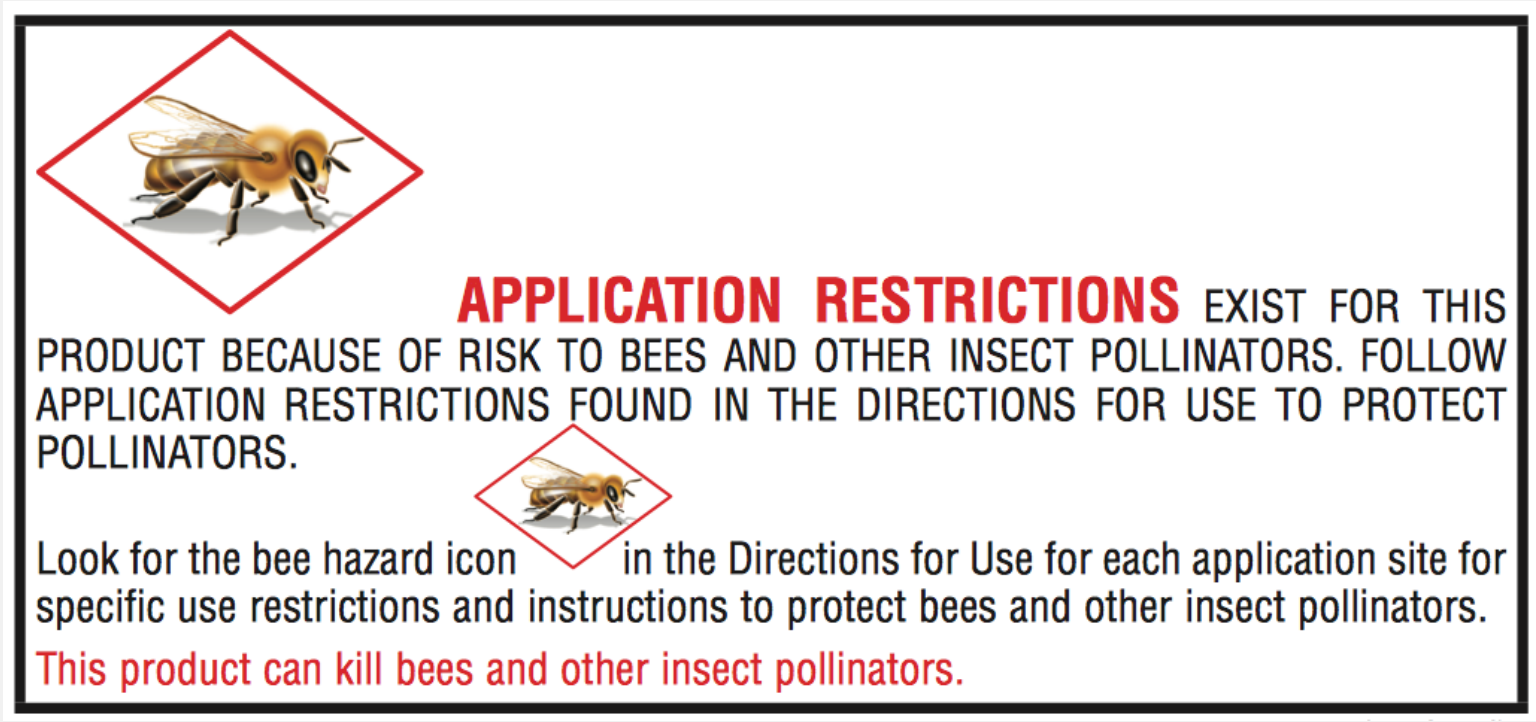
Phase-out of endosulfan (Thionex)

Date for final use	*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)

Deletions from midwest spray guides

- **Carzol** (formetanate hydrochloride)
  - **restricted to nectarines in Pacific NW**
- **Applaud** (buprofezin)
  - **for grapes**
  - **still exists, not registered in Ohio or most other midwest States**
- **Courier** (buprofezin)
  - **registered in Ohio but not in most other midwest States**

Pollinator Protection:
new bee advisory box on label



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

Pests of current interest

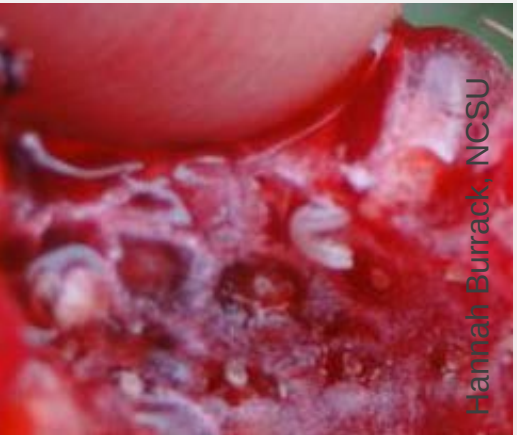
Old	**spider mites** 
Potential	**spotted lanternfly**  
New	**spotted wing drosophila** 
	brown marmorated stink bug

New invasive pests

Spotted wing Drosophila

Brown marmorated stink bug

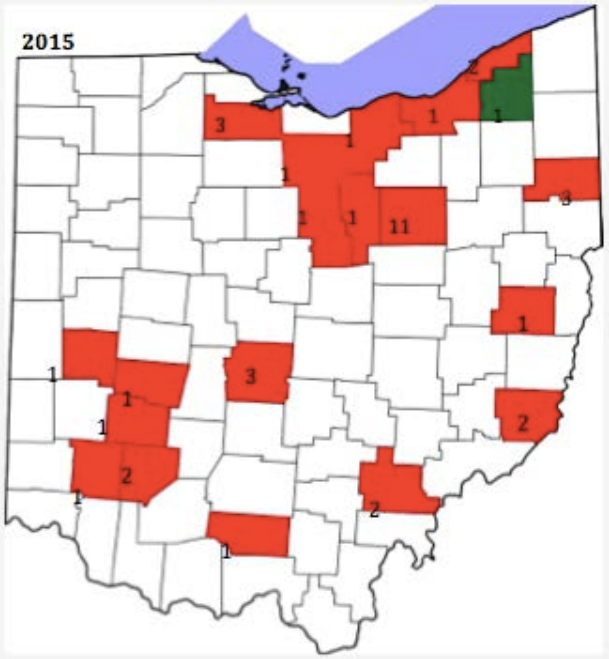
A new pest of fruit crops in Ohio:
Spotted wing Drosophila



- **Looks like common vinegar flies on overripe, fallen, decaying fruit**
- **The new species attacks <u>healthy</u> ripening fruit**
- **Larvae feed inside fruit**

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 (cyantraniliprole)**
	spinosyns: Delegate, Radiant (spinetoram) **Entrust (spinosad) [OMRI]**
	organophosphates: Imidan, Diazinon, Malathion
	pyrethroids: Mustang Maxx, Brigade, Pounce, Hero, Danitol, Baythroid, Warrior, Asana
	a carbamate: Lannate (methomyl)
Moderat-ely eff.	**a neonicotinoid: Assail (acetamiprid)** **a carbamate: Sevin (carbaryl)**
Slightly	**Pyganic (pyrethrins) [OMRI]**

Chart for SWD on all fruit crops

(u.osu.edu/pestmanagement/)

Efficacy	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	X	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
Slightly eff.	3A	Pyganic [OMRI]	1-3	0 days	0 days	0 days	0 days	0 days	0 days	0 days
Not effective	4A	Actara	1-3	3 days	3 days	X	5 days	14 days	14 days	14 days
	4A	Admire Pro	1-3	3 days	3 days	7 days	0 days	7 days	0 days	7 days

! *Restricted-Use Pesticide*

§ *Not allowed in greenhouses or high tunnels*

X *means that the product is NOT ALLOWED for use on that crop.*

Beware of number of sprays allowed
Example: raspberries

Product	*Pre-harvest interval*	*Maximum number of applications allowed* *(if used at max rate)*
Delegate	**1 day**	**3**
Mustang Maxx	**1 day**	**6**
Malathion	**1 day**	**3**
Entrust [OMRI]	**1 day**	**4**
Danitol	**3 days**	**2**
Brigade	**3 days**	**2**
Hero	**3 days**	**2**

Example: Management of 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)
    - Mustang Maxx (1-day PHI)
    - Malathion (1-day PHI)
- Do a salt test with ripe fruit, weekly
  - If find larvae: tighten to 5-day schedule

Brown marmorated stink bug


adult


nymph

- Attacks fruits & seed pods
- Invading Ohio since 2007

Brown marmorated stink bug: injury

apple

peach

pepper

corn

berries

tomato

Monitoring BMSB with traps

- **Improved lure by USDA-ARS**
- **Double lure for synergy**
  - ARS#20 (10 mg)
  - MDT (66 mg)
- **Available from several companies**
  - AgBio
  - Alpha Scents
  - Rescue
  - Trécé
  - Scentry
  - Bedoukian

Action threshold for BMSB on apples?

- Use 2 traps:
  - 1 on edge
  - 1 in interior
- Threshold = average 10 adults per trap
- Cumulative capture since last spray
- Once > threshold:
  - spray
  - re-set count to zero

Insecticides for stink bug

Product	*Apple*		*Peach*		*Raspberry*	
	PHI	*Limit*	*PHI*	*Limit*	*PHI*	*Limit*
Venom	-	-	3	1-2 ap.	-	-
Brigade, Hero	-	-	-	-	3	2-4 ap.
Belay	7	1 ap.	21	2 ap.	-	-
Leverage	7	1 ap.	7	2 ap.	-	-
Baythroid	7	1 ap.	7	2 ap.	-	-
Danitol	14	2-4 ap.	3	2-4 ap.	3	2-3 ap.
permethrin	Not after petal-fall	2 ap.	14	3 ap.	-	-
Assail	7	4 ap.	7	4 ap.	1	5 ap.
Actara	35	3 ap.	14	2 ap.	3	2-3 ap.

Potential pest of fruit crops in Ohio:

Spotted lanternfly

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

Spotted lanternfly

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

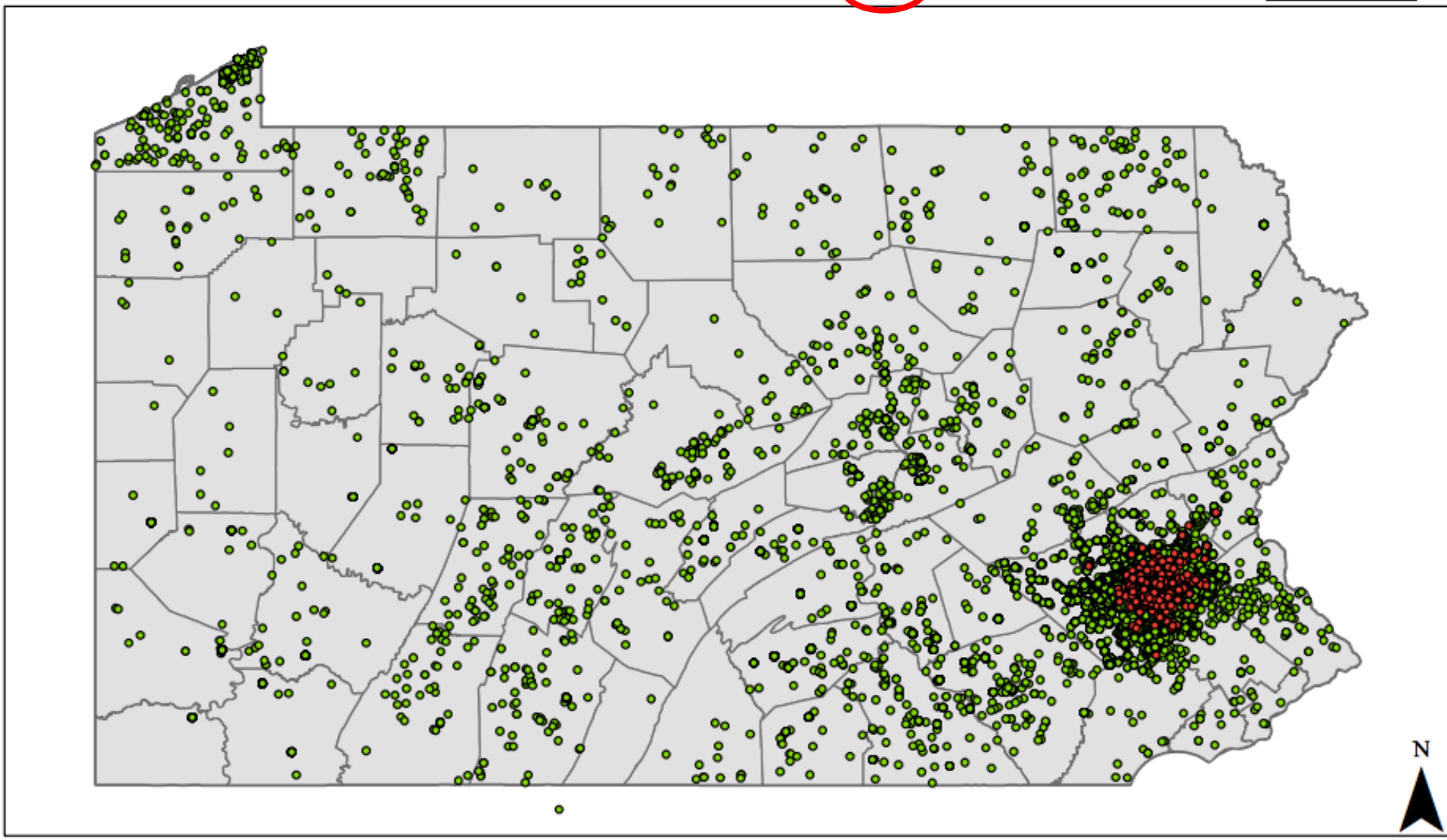
Spotted lanternfly: immatures

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

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

2014 -- 2016 Lycorma Detection Survey

Results through 4 October 2016



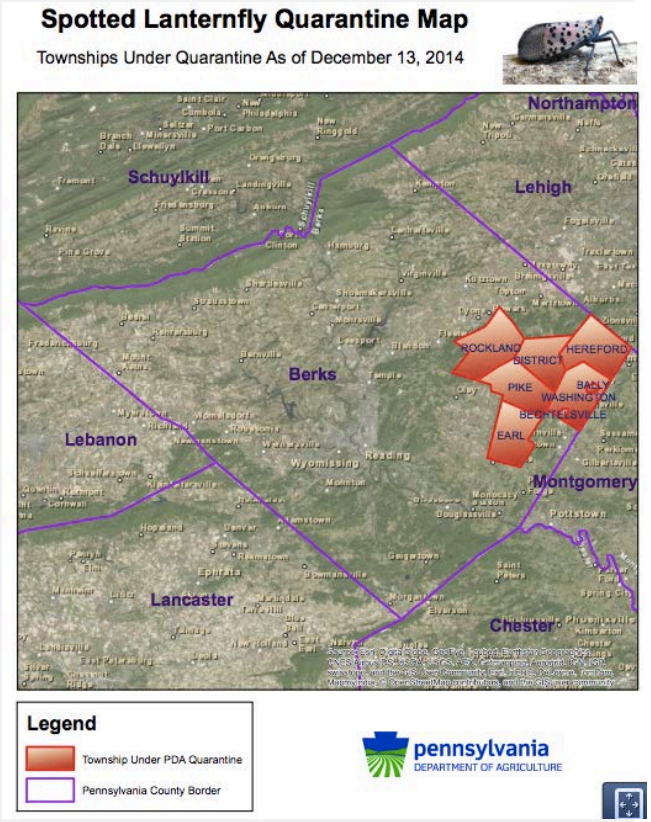
Spotted Lanternfly Presence

- Positive
- Negative

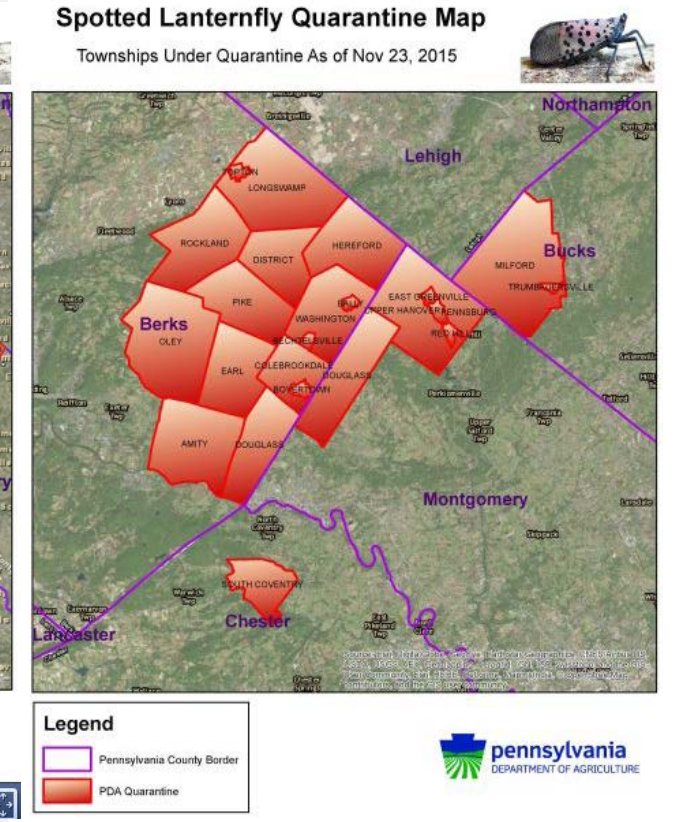
pennsylvania
DEPARTMENT OF AGRICULTURE

Qurantine for spotted lanternfly

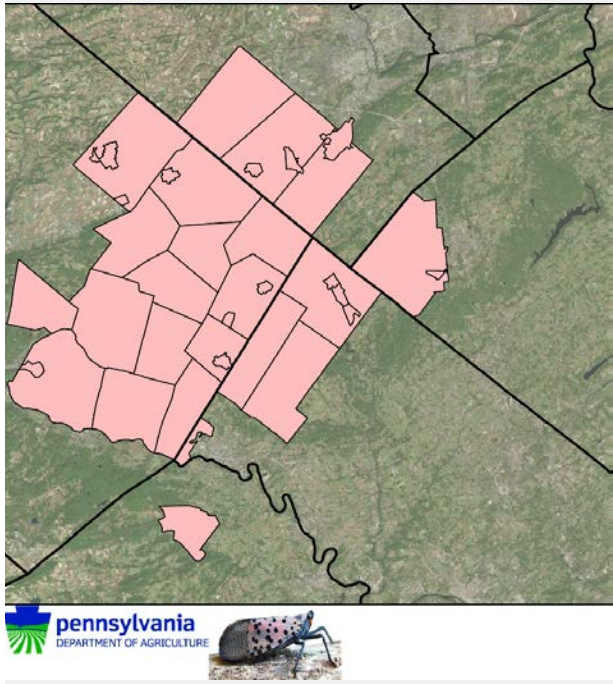
2014



2015



2016



Spotted lanternfly: hosts

- **Feeds on:**
  - Grape
  - Apple
  - Cherry
- **Hosts in fall:**
  - Tree of Heaven
  - Grapes

Spotted lanternfly: behavior

- **Congregate on trunk at base**

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: 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?

- Egg mass scraping
  - 643,160 killed as of 10/2016
- Tree banding
  - Sticky bands to catch nymphs
  - 511,197 killed as of 10/2016
- Quarantine

Recent problems with old pest: mites

- Two-spotted spider mite on vegetables

- European red mite on apples

Mites on apples

- **Flare-ups in 2016 after sprays for 17-year cicada**
- **See chart in handout on miticide choices**

Miticides on apples: 12 choices

Product	*Group*
Vydate (RUP)	1A
Agri-Mek (RUP)	6
Apollo	10A
Onager	10A
Savey	10A
Zeal	10B
Kanemite	20B
Nexter	21A
Portal	21A
Envidor	23
Nealta	25
Acramite	un

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Miticides on apples: 12 choices

Product	*Group*	*Target life stage*
Vydate (RUP)	1A	Nymphs & adults
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Onager	10A	Eggs & young nymphs
Savey	10A	Eggs & young nymphs
Zeal	10B	Eggs & young nymphs
Kanemite	20B	Nymphs & adults
Nexter	21A	Nymphs & adults
Portal	21A	Nymphs & adults
Envidor	23	Eggs, nymphs, adult females

Miticides on apples: 12 choices

Product	*Group*	*Target life stage*	*Predators*
Vydate (RUP)	1A	Nymphs & adults	harsh
Agri-Mek (RUP)	6	Nymphs & adults	moderate
Apollo	10A	Eggs & young nymphs	slight
Onager	10A	Eggs & young nymphs	slight
Savey	10A	Eggs & young nymphs	slight
Zeal	10B	Eggs & young nymphs	moderate
Kanemite	20B	Nymphs & adults	slight
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Portal	21A	Nymphs & adults	slight *
Envidor	23	Eggs, nymphs, adult females	moderate

Two-spotted spider mite

- Often overlooked
- Often mistaken for disease
- Build up in hot dry weather

Two-spotted spider mite: identification

- Tiny (1/60 inch)
- White with 2 black spots
- 8 legs

Two-spotted spider mite: hosts & symptoms

- **Tomato**
  - Yellow blotches
- **Bean**
  - White stippling

Two-spotted spider mite: hosts & symptoms

- **Watermelon**
  - –Yellow blotches
  - –Brown lesions

Two-spotted spider mite: hosts & symptoms

- **Sweet corn**
  - **Flag leaf**

Two-spotted spider mite: diagnosis

- Fine webbing on leaf underside
- Scout by tapping leaf over paper, look for moving specks
- Early diagnosis for good control

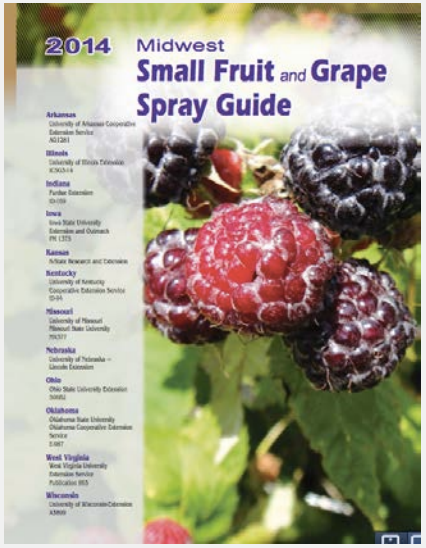
Spider mite management

- Tolerable at low density
- Conserve natural predators
- Overhead irrigation can help
- Soft control:
  - Insecticidal soap
  - Horticultural Oil
- Chemical control:
  - Agri-Mek or others

Insecticides for spider mites

- **Organophosphates**
  - Dimethoate
  - MSR (Metasystox-R) RUP
- **Miticides (newer)**
  - Agri-Mek RUP
  - Acramite
  - Oberon
  - Zeal
  - Portal
- **Miticides (older)**
  - Dicofol, Kelthane
  - Vydate RUP

News on fruit spray guides



- **2015 & earlier:**
  - Midwest Small Fruit & Grape Spray Guide, 88 pp (~$10)
  - Midwest Tree Fruit Spray Guide, 72 pp (~$10)
  - buy from OSU
- **2016:**
  - Midwest Fruit Pest Management Guide, 168 pp (~$15)
  - buy directly from Purdue University

Resources on website u.osu.edu/pestmanagement/

- **Reports on Ohio insecticide trials**
  - **Apples: 2003-2016**
  - **Bell pepper: 2013, 2014, 2016**
  - **Cabbage: 2010, 2012, 2013, 2015**
  - **Sweet corn: 2007-2015**
- **IPM guidelines**
  - **Sweet corn**
  - **Apples**
- **Trap reports from Ohio locations**
- **Pictures of pests**

the end

Info on fruit & veg. pests
u.osu.edu/pestmanagement/

Questions?
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