

RUTGERS

THE STATE UNIVERSITY
OF NEW JERSEY

Insect Pest Management Update

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Lorsban!

69080

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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 180

[EPA–HQ–OPP–2015–0653; FRL–9935–92]

Chlorpyrifos; Tolerance Revocations

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: On August 10, 2015, the U.S. Court of Appeals for the Ninth Circuit ordered EPA to respond to an administrative Petition to revoke all tolerances for the insecticide chlorpyrifos by October 31, 2015, by either denying the Petition or issuing a proposed or final tolerance revocation. At this time, the agency is unable to conclude that the risk from aggregate exposure from the use of chlorpyrifos meets the safety standard of section 408(b)(2) of the Federal Food, Drug, and Cosmetic Act (FFDCA). Accordingly, EPA is proposing to revoke all tolerances for chlorpyrifos. EPA is specifically soliciting comment on whether there is an interest in retaining any individual tolerances, or group of tolerances, and whether information exists to demonstrate that such tolerance(s) meet(s) the FFDCA section 408(b) safety standard. EPA encourages interested parties to comment on the

along with more information about dockets generally, is available at <http://www.epa.gov/dockets>.

FOR FURTHER INFORMATION CONTACT: Dana Friedman, Pesticide Re-Evaluation Division (7508P), Office of Pesticide Programs, Environmental Protection Agency, 1200 Pennsylvania Ave NW., Washington, DC 20460–0001; telephone number: (703) 347–8827; email address: friedman.dana@epa.gov.

SUPPLEMENTARY INFORMATION:

I. General Information

A. Does this action apply to me?

You may be potentially affected by this action if you are an agricultural producer, food manufacturer, or pesticide manufacturer. The following list of North American Industrial Classification System (NAICS) codes is not intended to be exhaustive, but rather provides a guide to help readers determine whether this document applies to them. Potentially affected entities may include:

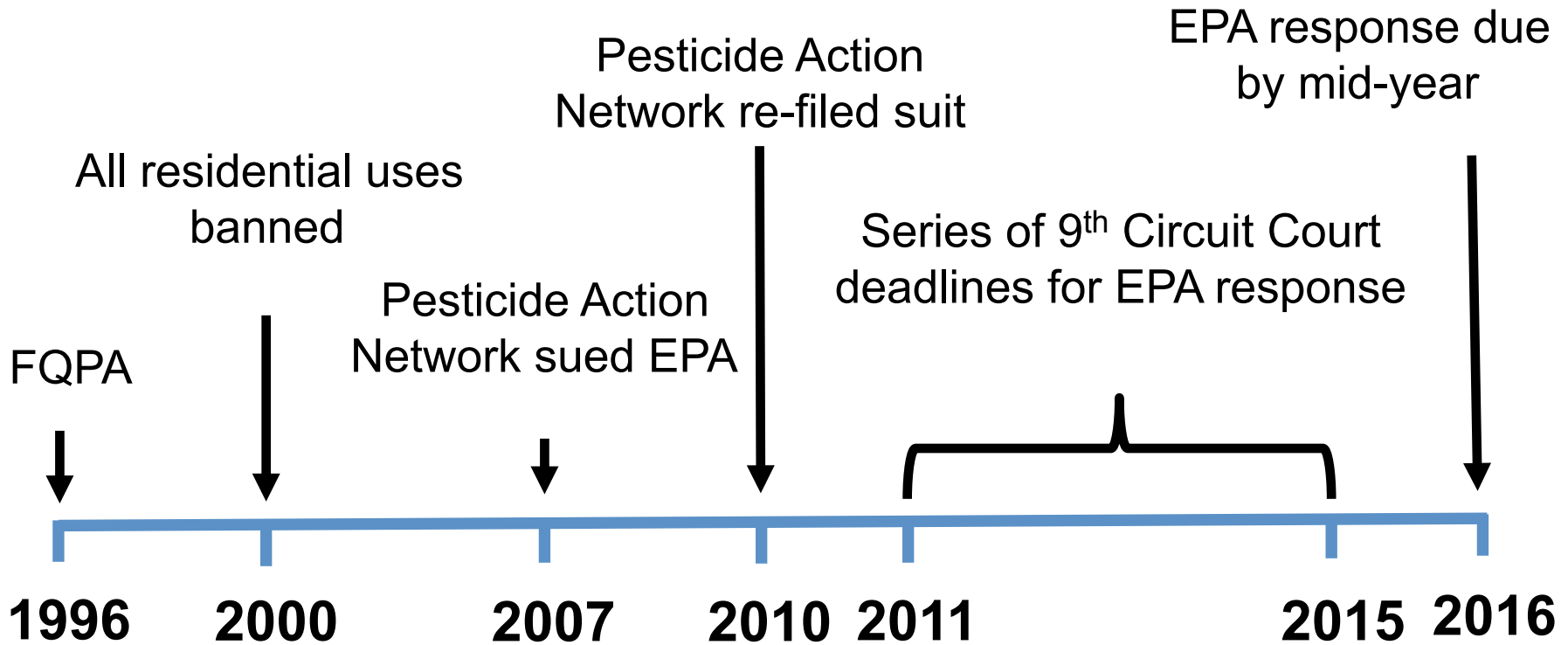
- Crop production (NAICS code 111).
- Animal production (NAICS code 112).
- Food manufacturing (NAICS code 311).
- Pesticide manufacturing (NAICS code 32532).

B. What should I consider as I prepare my comments for EPA?

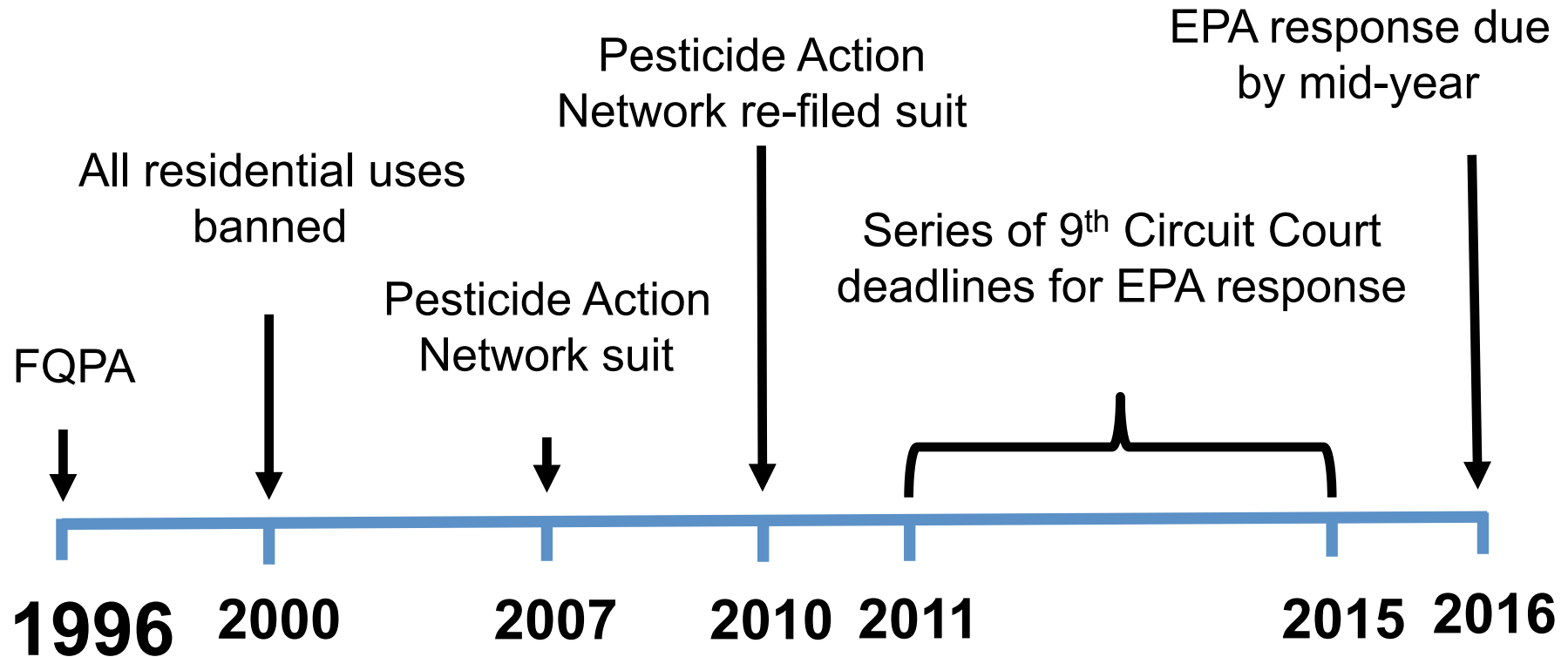
on the agency’s proposal. EPA will issue a final rule after considering the comments that are submitted. Comments should be limited only to the pesticide and tolerances subject to this proposal.

EPA’s finding that it cannot determine if aggregate exposure from all existing uses of chlorpyrifos are safe, does not necessarily mean that no individual tolerance or group of tolerances could meet the FFDCA 408(b)(2) safety standard and be maintained. EPA’s risk assessment supporting this proposed rule indicates that the primary source of risk comes from chlorpyrifos and chlorpyrifos oxon in drinking water in highly vulnerable watersheds (generally small watersheds where the land is agricultural and could be treated with chlorpyrifos (*i.e.*, heavily cropped areas)). However, as explained in this proposed rule, some uses of chlorpyrifos do not by themselves present risks of concern from either food or drinking water and are only a concern when aggregated with all exposures to chlorpyrifos. EPA therefore invites comments that address whether some tolerances or groups of tolerances can be retained. In that regard, in addition to information related to the safety of such tolerances, use site specific information pertaining to the pests targeted by chlorpyrifos, and the alternatives to chlorpyrifos for these pests, may help to

What's happening with chlorpyrifos? A bit of history



What's happening with chlorpyrifos?



“Highly likely” that all tolerances for chlorpyrifos on food crops will be revoked by about mid-2016

USDA Response (January 5, 2016)

- Extremely valuable tool for managing a wide array of insect pests
- Most critical uses in non-citrus tree fruit east of the Mississippi are for tree-boring insects
- Apple: dogwood borer, American plum borer, & ambrosia beetles (e.g. black stem borer)
- Stone fruit: American plum borer, lesser peachtree borer & peachtree borer

Lesser Peach Tree Borer

- *Synanthedon pictipes*
- Adults are ½” clear-winged moths
- Metallic blue with yellow/white stripes
- Indirect pest of peach
- Wounding sites or canker
- Primarily among scaffold limbs and upper trunk
- OW as larvae under tree bar
- Resume feeding around pink – shuck fall
- Two generations
 - Shuck split
 - July - August



Peach Tree Borer

- *Synanthedon exitiosa*
- Clear-winged metallic moths
- Males have narrow yellow bands
- Can establish in a healthy tree
- Pupate at soil surface
- Flight occurs June – Sept.
- 1 generation
- Larvae feed on cambium
- Can girdle young trees within a year
- Feeding on older trees weakens them



Dogwood Borer

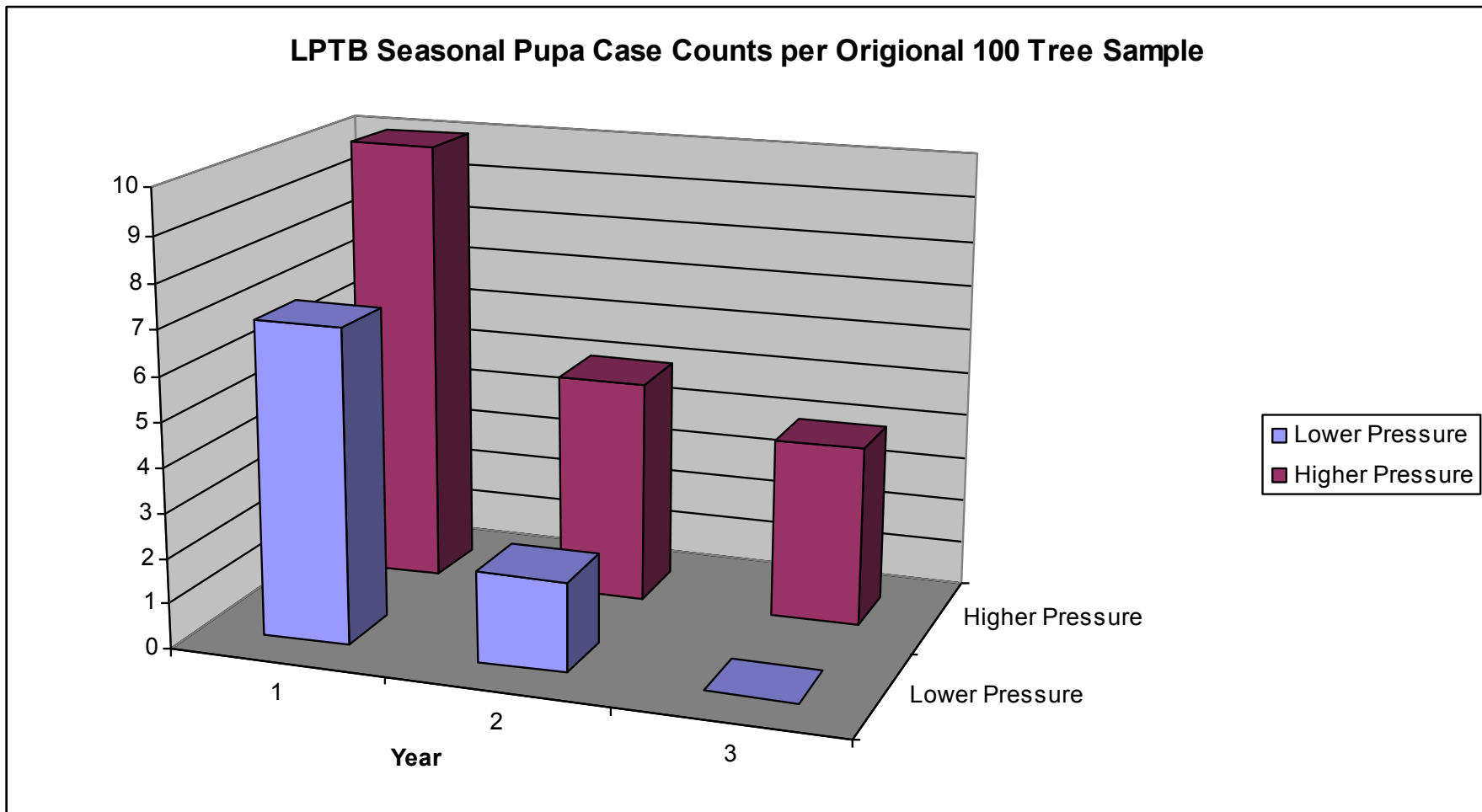
- *Synanthedon scitula*
- Blue/black body with yellow stripe
- Wide host range including apple and plum
- Flight occurs in mid-late May with a second peak July – August
- Eggs are laid in wounds or burr knots
- Larvae form galleries beneath the bark
- 1-2 years to develop
- Tree decline and reduced yield



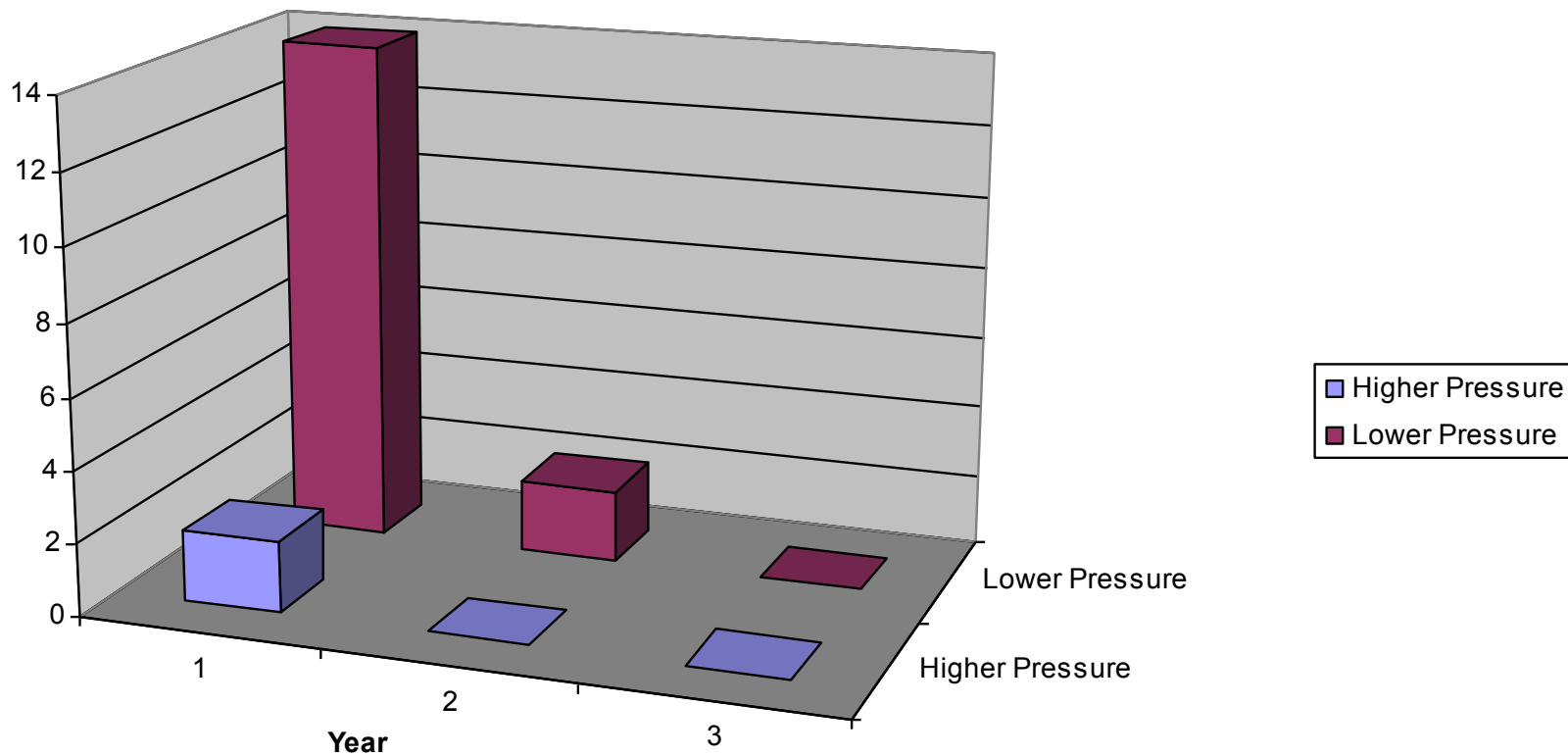
Alternatives to chlorpyrifos

- *Mating disruption*
- *Works through competitive attraction*
- *Can be affected by immigration of mated females from wild hosts or untreated blocks*
- *The larger scale MD is applied to the better*
- *Catches in traps will decline*
- Isomate PTB-Dual (Pacific Biocontrol/CBC America)
 - Season-long disruption of LPTB and PTB
 - 150 - 200 ties/acre at chest height
 - Economic analysis suggested cost savings compared to Lorsban
- Isomate DWB in apple
- Deploy uniformly throughout treated area





GPTB Seasonal Pupa Case Counts per Original 100 Tree Sample



Mating disruption for peach borers in small block orchards

Objective: Effectiveness of PB mating disruption in orchards <5 acres

Methods:

- Commercial peach orchard in Hampshire, Co. WV
- Post-harvest application of Lorsban Advanced (3 qt/100 gal)
- Isomate PTB-Dual applied prior to LPTB emergence (150 ties/A)
- PTB and LPTB monitored weekly using pheromone traps
- Tree infestation by PTB and LPTB evaluated on May 4 and Nov 5



**Lorsban 2
(4.75 A)**

**Disrupted 1
(2.26 A)**

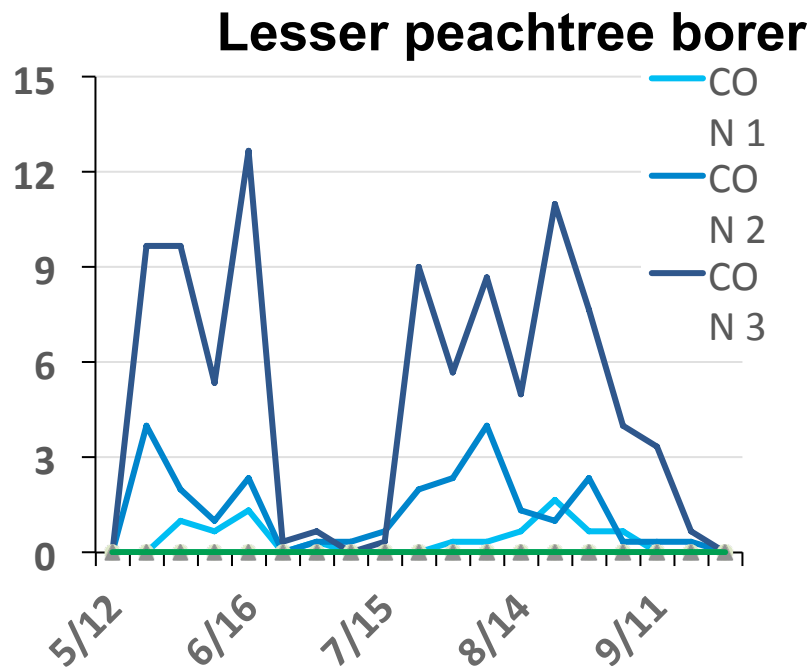
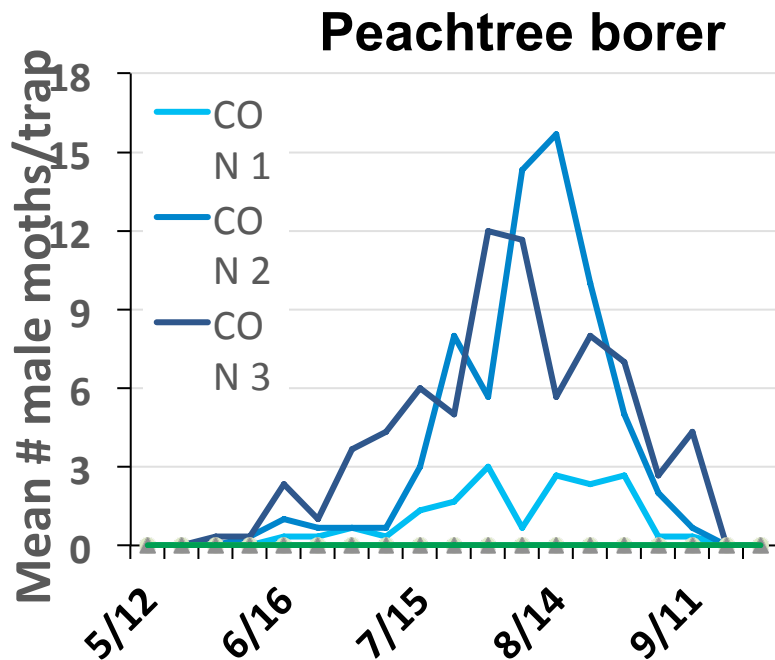
**Lorsban 1
(1.5 A)**

**Disrupted 2
(3.76 A)**

**Lorsban 3
(4.58 A)**

**Disrupted 3
(3.65 A)**

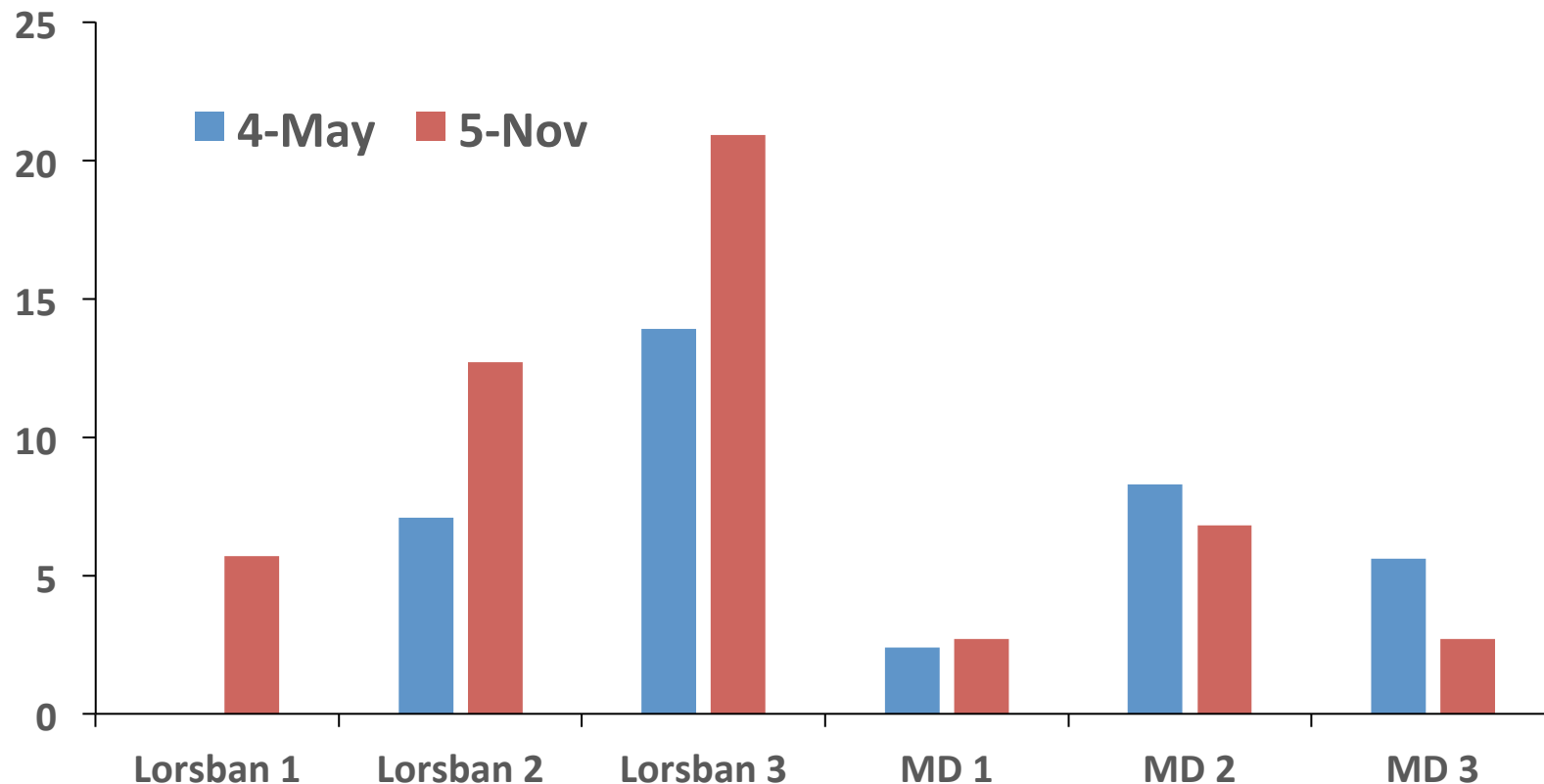
Moth captures



Mating disruption eliminated captures of male borers

Damage evaluations

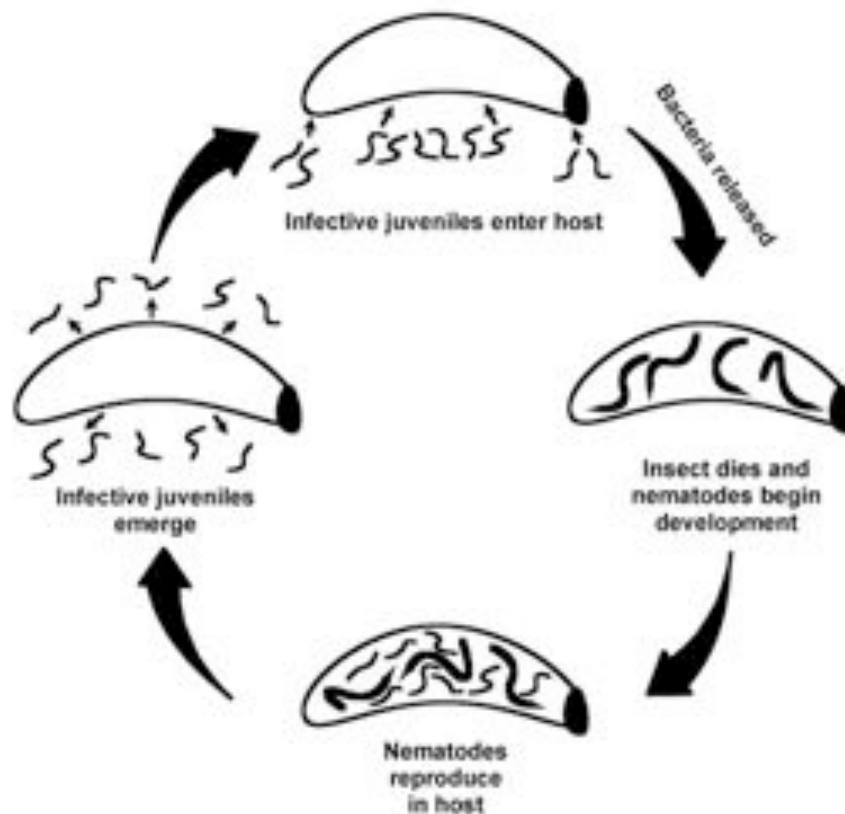
% trees infested with PTB and/or LPTB



Alternatives to Lorsban

Entomopathogenic nematodes

- Naturally occurring in soils throughout the US
- Commercially available “bio-insecticides”
- Exempt from EPA registration
- Two genera: *Steinernema* & *Heterorhabditis*
- Can be applied using standard agricultural equipment

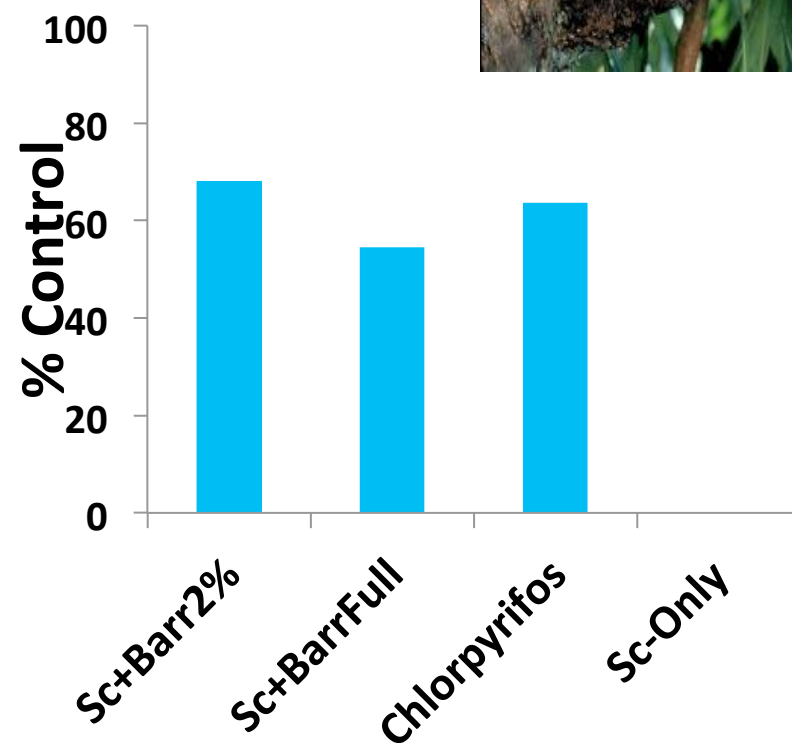
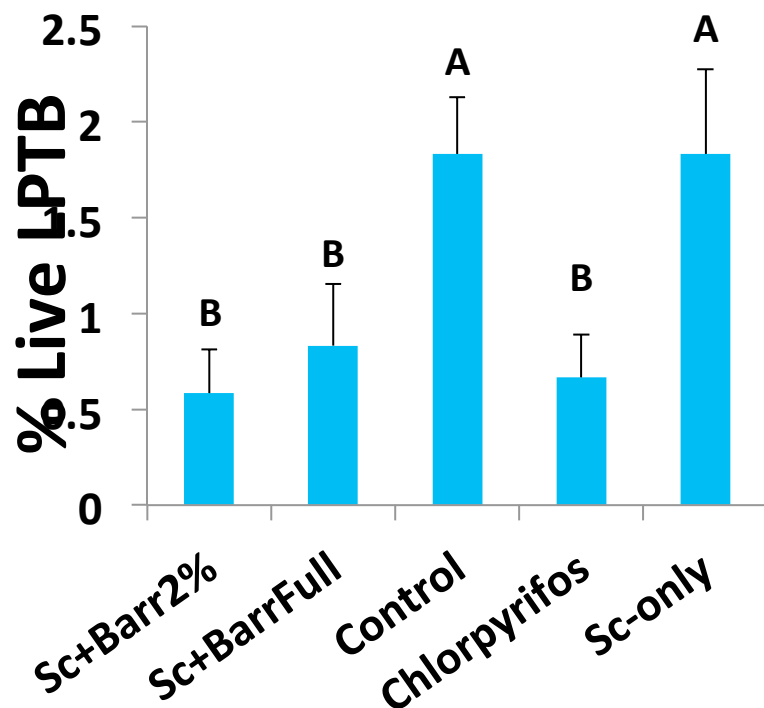


Nematodes vs. LPTB: Quincy, FL

- Treatments:
 1. *S. carpocapsae* (Sc) + 4% Barricade firegel
 2. *S. carpocapsae* + 2% Barricade firegel
 3. *S. carpocapsae* alone
 4. chlorpyrifos
 5. Water control
- Treatments applied with handgun to LPTB-infested wounds on Nov. 5, 2013
- Assess live/dead LPTB one week later
- Repeated in fall 2014



LPTB Field Trial Results: 2013



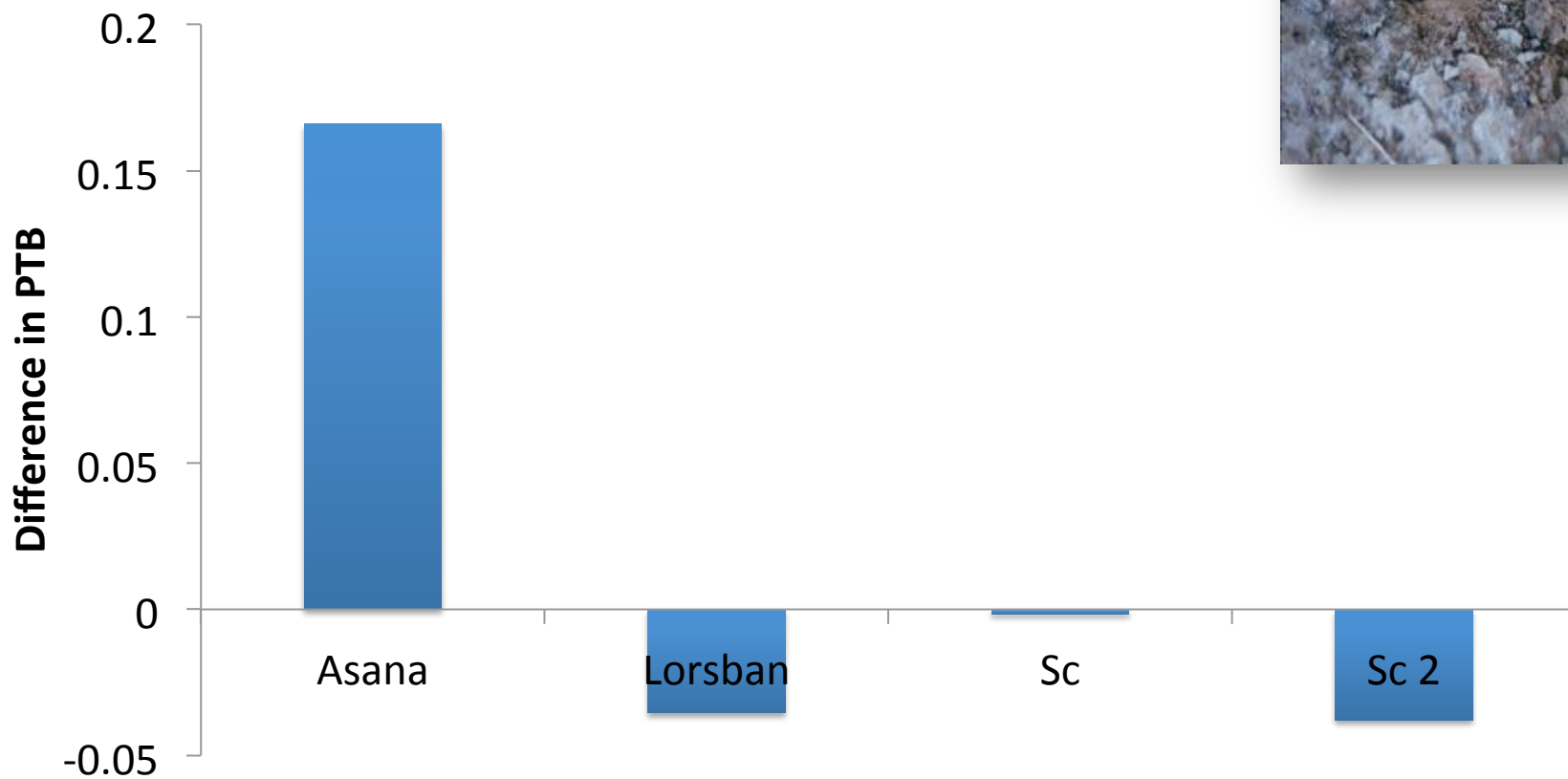
Sc + Barricade at full and 2% rates provided equal control to chlorpyrifos

Nematodes vs. PTB

- Alternative management for PTB
- Commercial farm (2012, 2013)
- Commercial strain of *S. carpocapsae*
- Applied in Fall (post-harvest) with hand-gun



Peachtree borer trial: 2013



Conclusions

Lesser peachtree borer:

- One spray of Barricade can enhanced nematode persistence aboveground
- Control similar to chlorpyrifos
- Enhance formulation further with adjuvants (sunscreens)?

Peachtree borer:

- Fall applications of *S. carpocapsae* equal to chlorpyrifos
- Curative spring applications of *S. carpocapsae* equal to or better than chlorpyrifos
- Trunk sprayer, boom sprayer, handgun all effective
- Barricade could replace need for irrigation in treated areas
- Nematodes ~\$15/A; Barricade ~\$5 more

Slide courtesy of David Shapiro-Ilan, USDA
ARS, Byron, GA

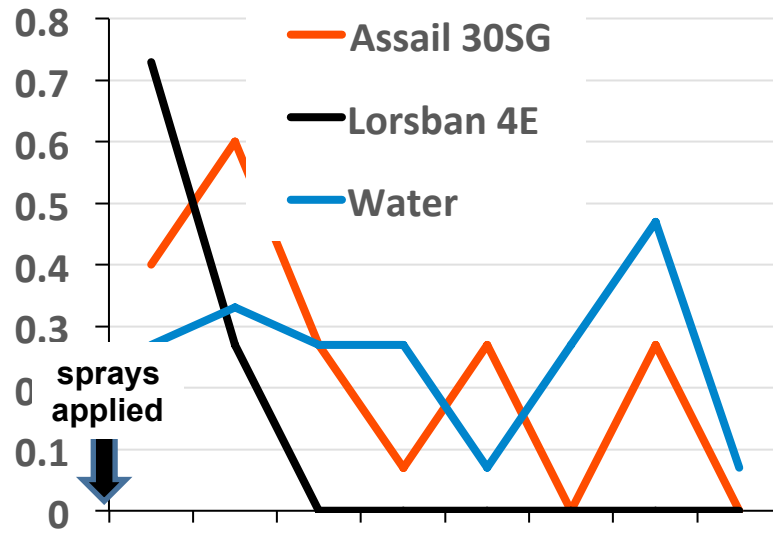
Alternatives to chlorpyrifos: Dogwood borer

- Assail 30SG is the only other insecticide labelled for trunk sprays against DWB
- “Apply spray to tree trunks. Time first application after moth emergence, to coincide with egg-laying period. Make a second application 14 to 21 days later.”



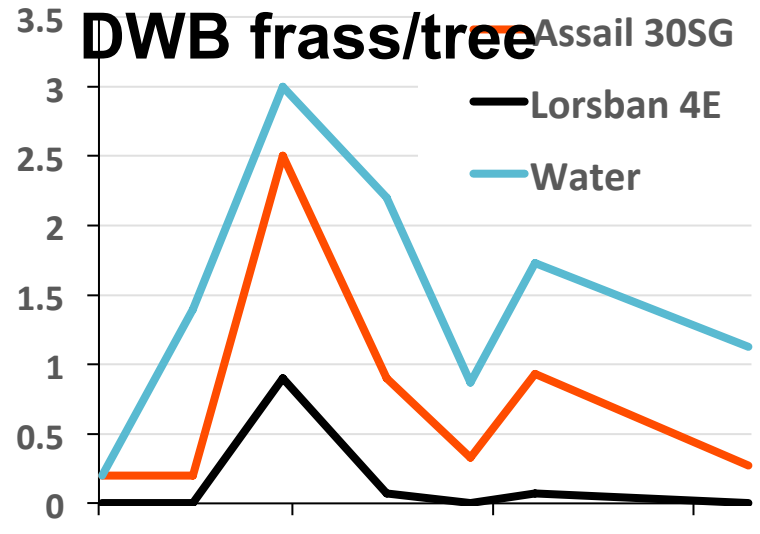
Assail vs dogwood borer in Idared & Golden Delicious: 2004

Mean # of DWB pupal cases/tree



Only Lorsban prevented larvae from developing into moths

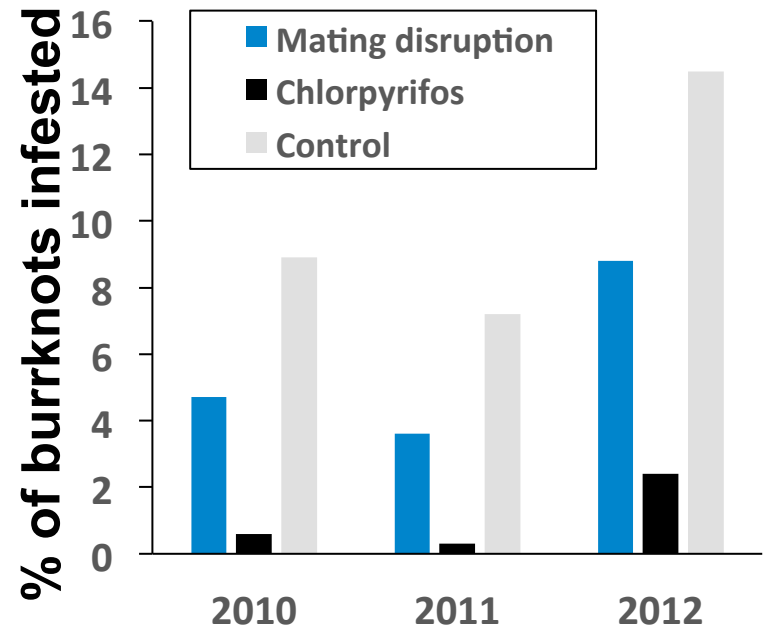
Mean # of sites of fresh DWB frass/tree



Lorsban reduced the number of infestation sites compared with Assail

Dogwood borer management with mating disruption

- Isomate DWB (Pacific Biocontrol/CBC America)
- Twist-tie dispenser containing DWB pheromone
- 100-150 ties/acre, depending upon pressure
- Apply before the end of May (prior to adult DWB emergence)
- Place on branches at chest height





Modena, Italy

- Primary control option is chlorpyrifos

Quali prodotti impiegare su pomacee?

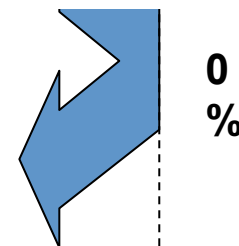
Gruppo chimico	Sostanze attive	Vincoli da DPI (n. massimo interventi ammessi)
Esteri fosforici	Clorpirifos metile (*) Clorpirifos (max 2) Fosmet (max 2)	5
Neonicotinoidi	Acetamiprid (max 2)	2
Piretroidi	Etofenprox(**)	1

Modena, Italy

- Primary control option is clorpyrifos
- Investigated hail netting
- Permanent structure
- Placed over trees post bloom

NET

2.2 mm x
5.4 mm





Results from Modena, Italy

N.Azienda Località	Management	Specie/ Cultivar	% Damage NET	% Damage No NET
1. Spilamberto (Mo)	Agricoltura Biologica	Pear – Abate F.	8	50
2. Ravarino (Mo)	Produzione Integrata	Apple –Fuji	3	10 *
3. Cento (Fe)	Produzione Integrata	Apple– Fuji	9	23*

* Insecticides against *H.halys*

In conclusion:

- Revocation of tolerances for chlorpyrifos is likely by mid-2016
- Will require the use of alternative tools for some pests
- Some pests should be effectively controlled with alternative tools
- Others may become more difficult to manage
- Mating disruption and EPNs are viable option for peach borers
- Mating disruption for DWB