

Arthropod Management for Turf and Ornamentals

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Fall armyworm (FAW)

Spodoptera frugiperda

- Native from the Americas
- Problematic in the tropics
 - Do not overwinter in VA
- Moved by hurricane / storm
- Problem in late summer & fall





Scouting



1) Digging



2) Floating



3) Drenching



4) Visual Inspection

Scarab Beetles

Common in Virginia

Green
June
beetle

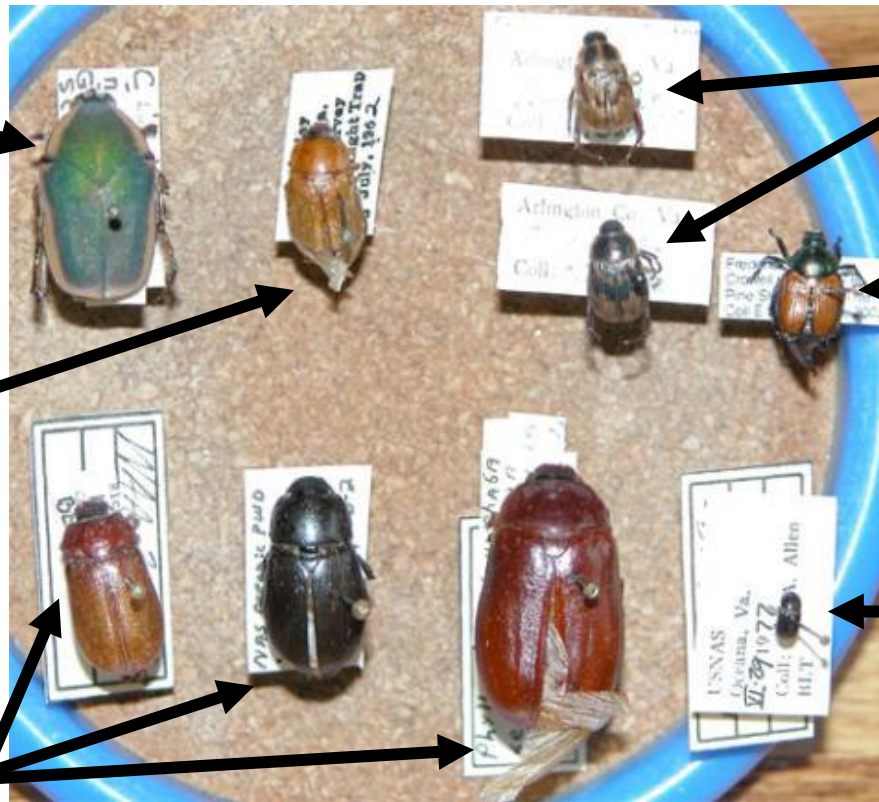
Oriental beetle

Japanes
e beetle

Masked chafer

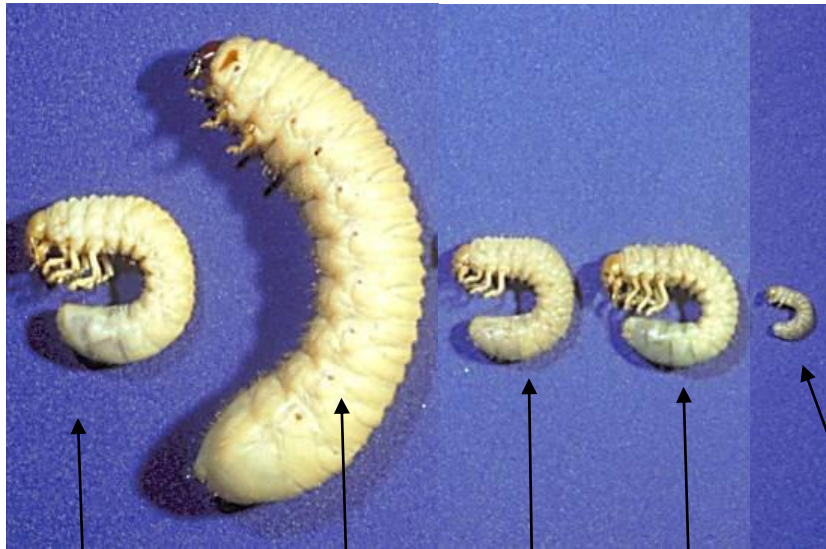
Black
turfgrass
Ataenius

May/June Beetles



(Slide adapted from T. Kuhar)

Grub complex in Virginia



May/June Beetle

green June beetle

Japanese beetle

Masked chafer

Ataenius

- “C” shaped
- Only prothoracic legs (true legs)
- Has mandibles
- Feeds on roots

Ants

- Field ants



- Little black ant



- Pavement ants





totallawnncareinc.com



D. Shetlar

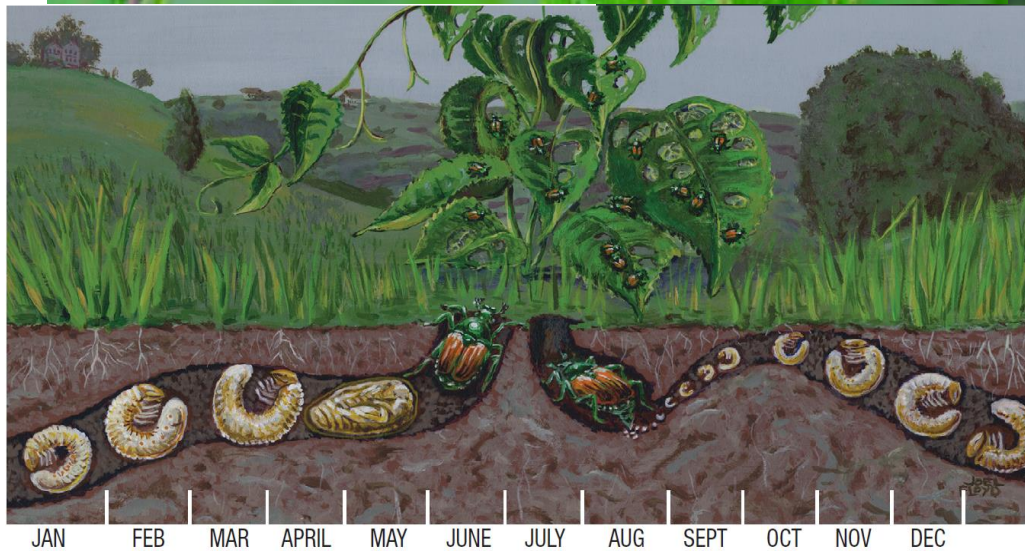


terminix.com



W. Tyson

Japanese beetle, *Popillia japonica*



The Japanese beetle life cycle. (Illustrated by APHIS employee Joel Floyd.)

Caterpillars



Fall webworm



Azalea caterpillar



Orangestriped oak worm



Saddleback caterpillar



Canker worms



Bag worm

Aphids

- Piercing mouthparts
- Honeydew
- Reduce vigor
- Many different species and hosts
- Tended by ants



Scales

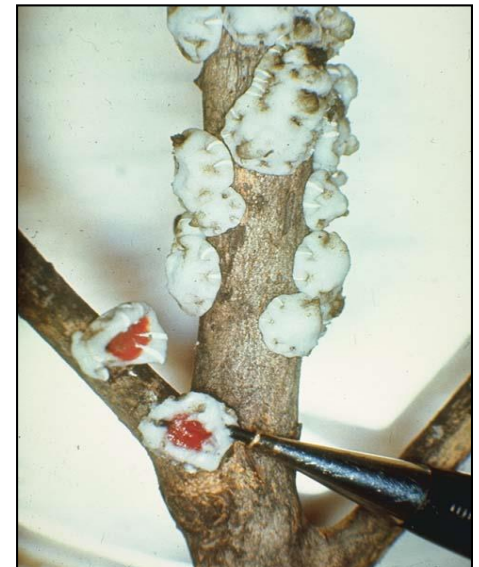
Armored

- Small, inconspicuous, irregular
- No honeydew
- Waxy cover is not attached



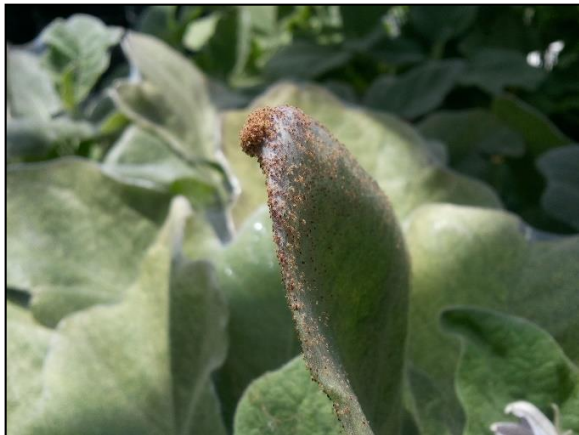
Soft

- Prominent, cylindrical
- Honeydew
- Waxy layer cannot be separated



Spider Mites

- Common pests of evergreens including holly
- Red spider mites (southern red mite, spruce spider mite) are most damaging in cool, dry weather
- Two-spotted spider mite found in hot, dry weather



(Slide adapted from E. Day)

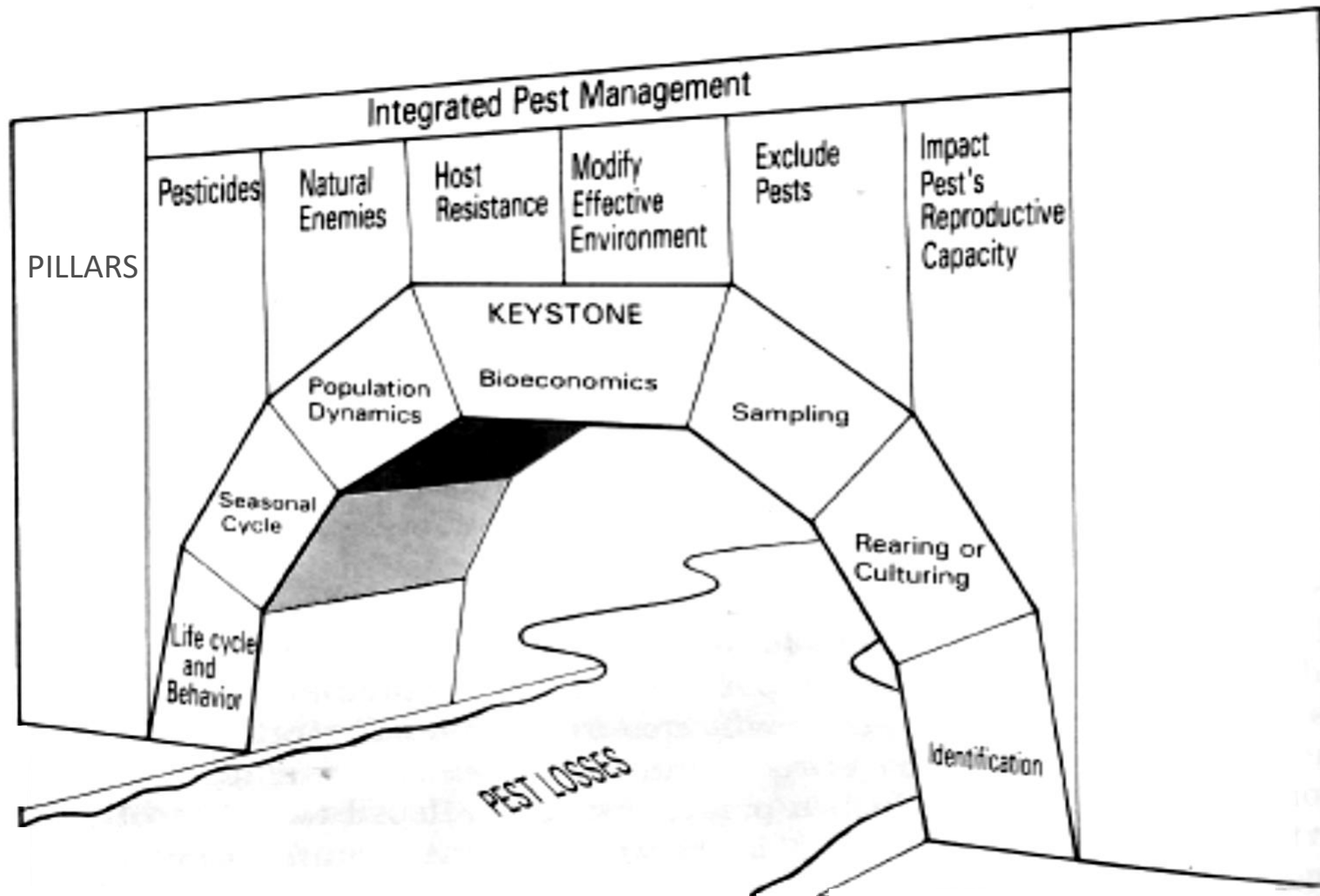
Integrated Pest Management



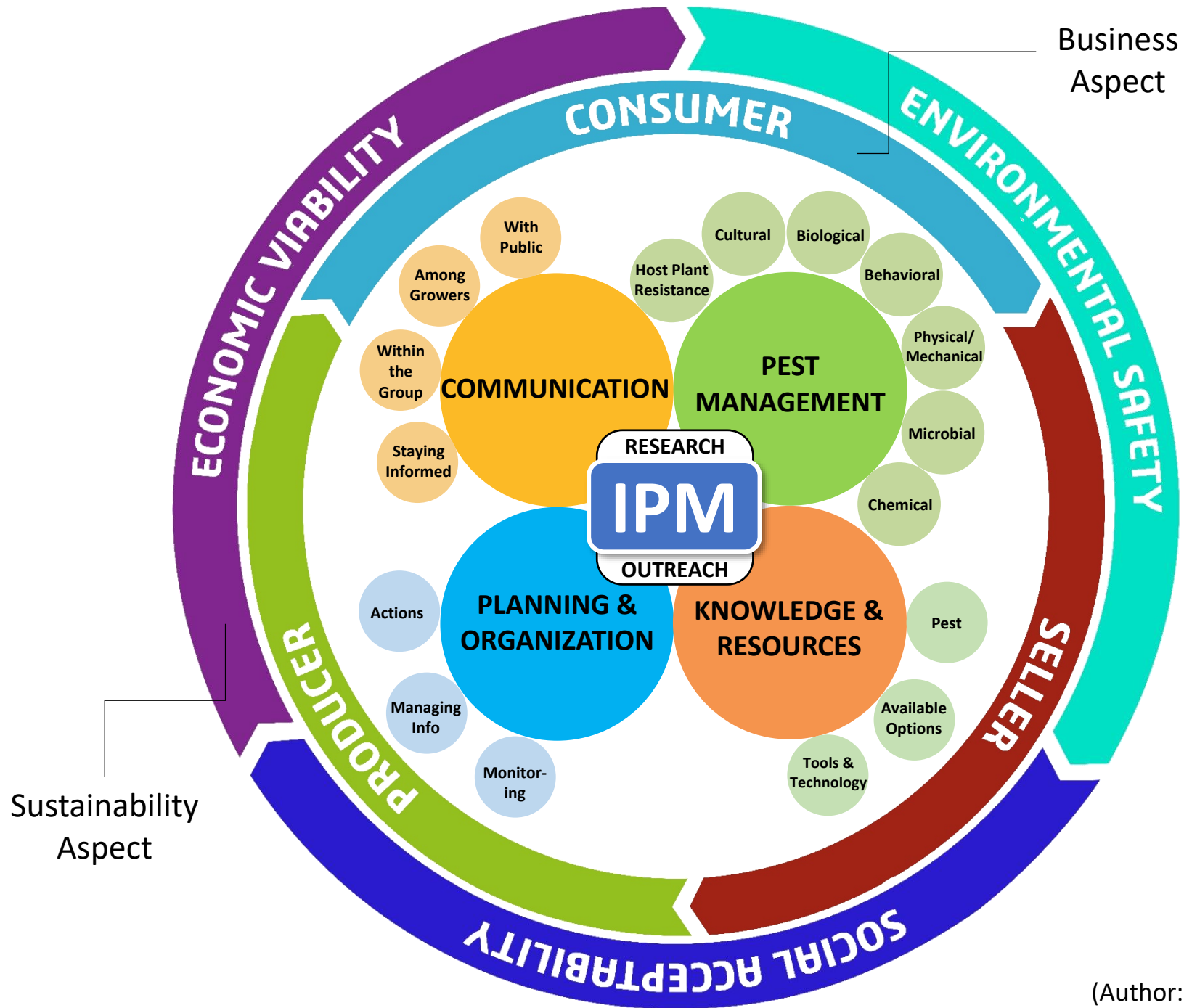
(Deguine et al 2021)

- Integrated Control – back in the 60s (Stern et al 1959)
- Up to 67 definitions (Bajwa and Kogan 2002)

Integrated Pest Management (IPM)

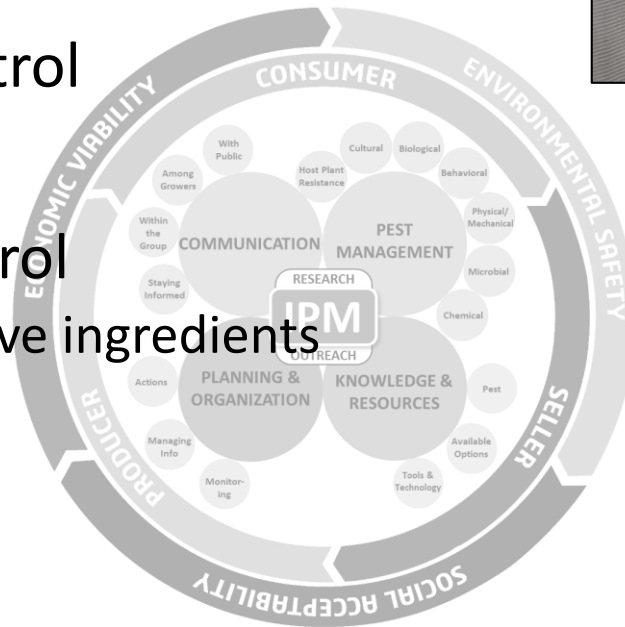


(Author: Larry Pedigo)



IPM for Turfgrass & Ornamentals

- Cultural Control
 - Different practices
- Biological Control
- Chemical Control
 - Different active ingredients



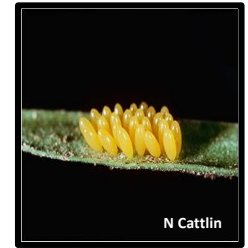
Cultural Control

- Variety selection
- Irrigation & fertilization
- Mowing height
- Pruning
- Sanitation:
 - Remove clippings, dead branches



Biological Control

- Naturally occurring beneficials



Biopesticide options for grub control

Bacillus popilliae –
soil bacteria that
kills grubs



Entomopathogenic fungi

- *Metarhizium* - green muscardine disease
- *Beauveria bassiana* – white muscardine disease



(Slide adapted from T. Kuhar)

Insecticides: the most widely-used tactic



(Slide adapted from T. Kuhar)

Horticultural Oils

- Timing of applications
 - Dormant applications: before bud swelling and bud break
 - Summer applications: all year round

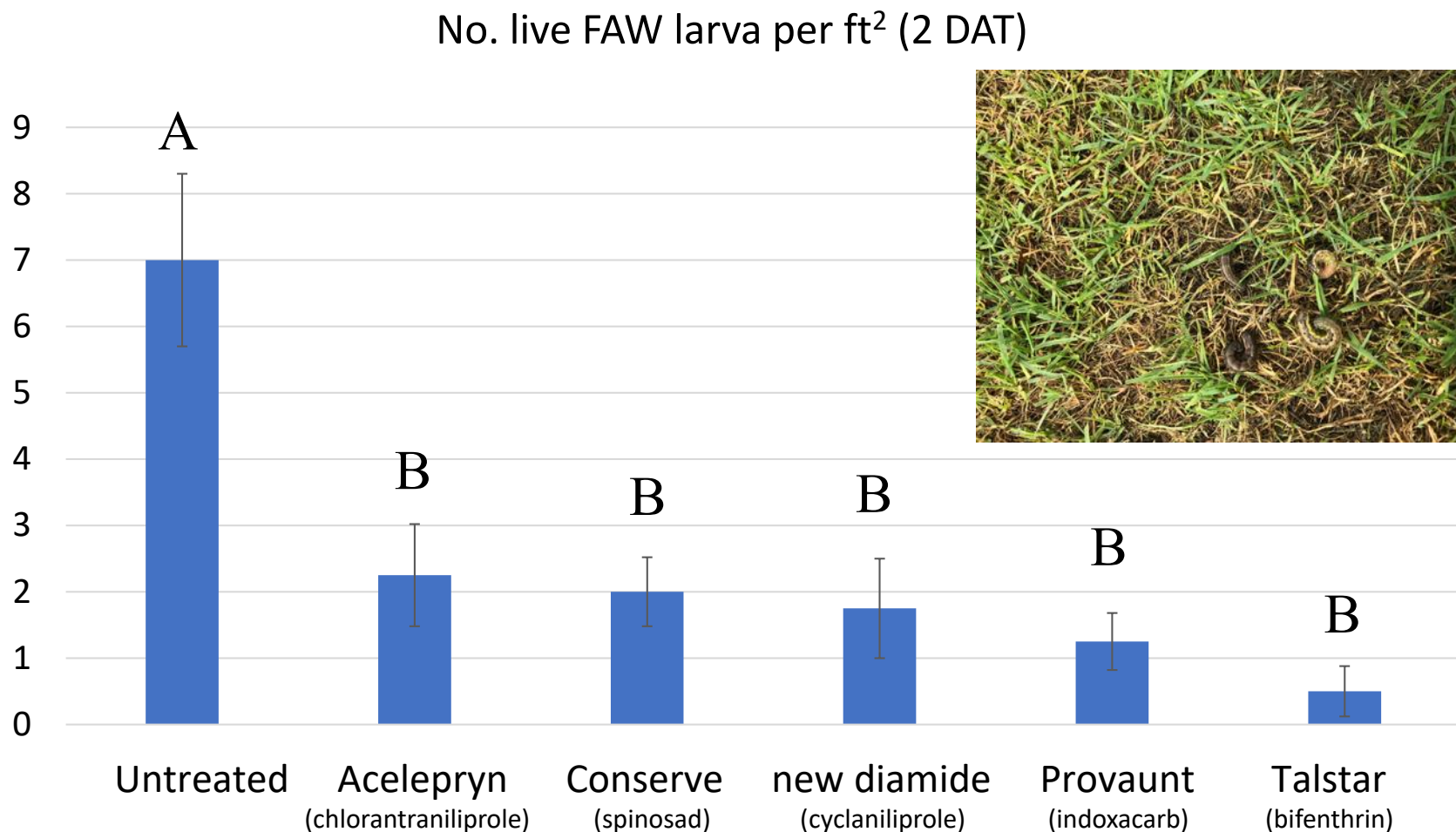


Precautions for using oils (Cranshaw & Baxedale 2005)

- Sensitive plants
- High Temps >100°F or freezing Temps
- Wet or upcoming rain – inhibit evaporation
- Growing shoots
- With sulfur or copper
- Agitation in the tank



Insecticide trial on FAW – Blacksburg, VA

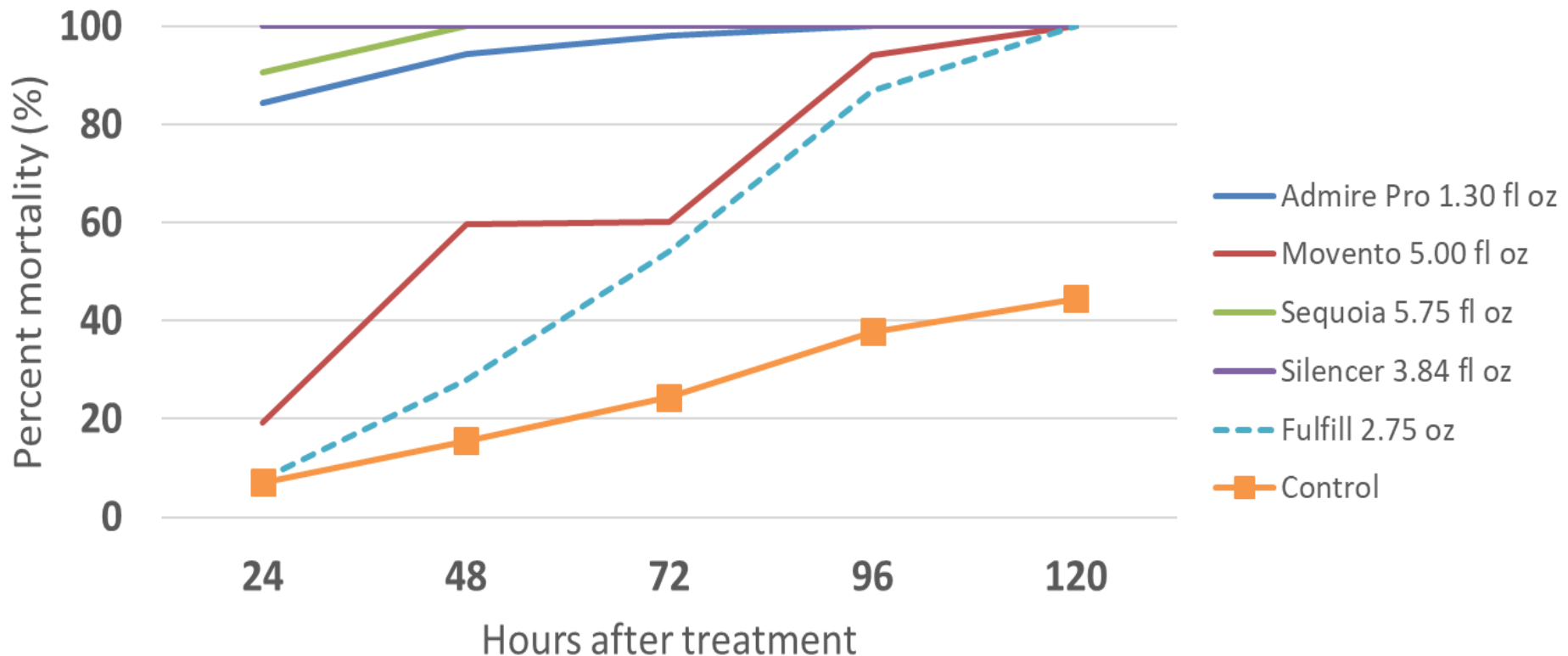


(Kuhar et al. 2019)

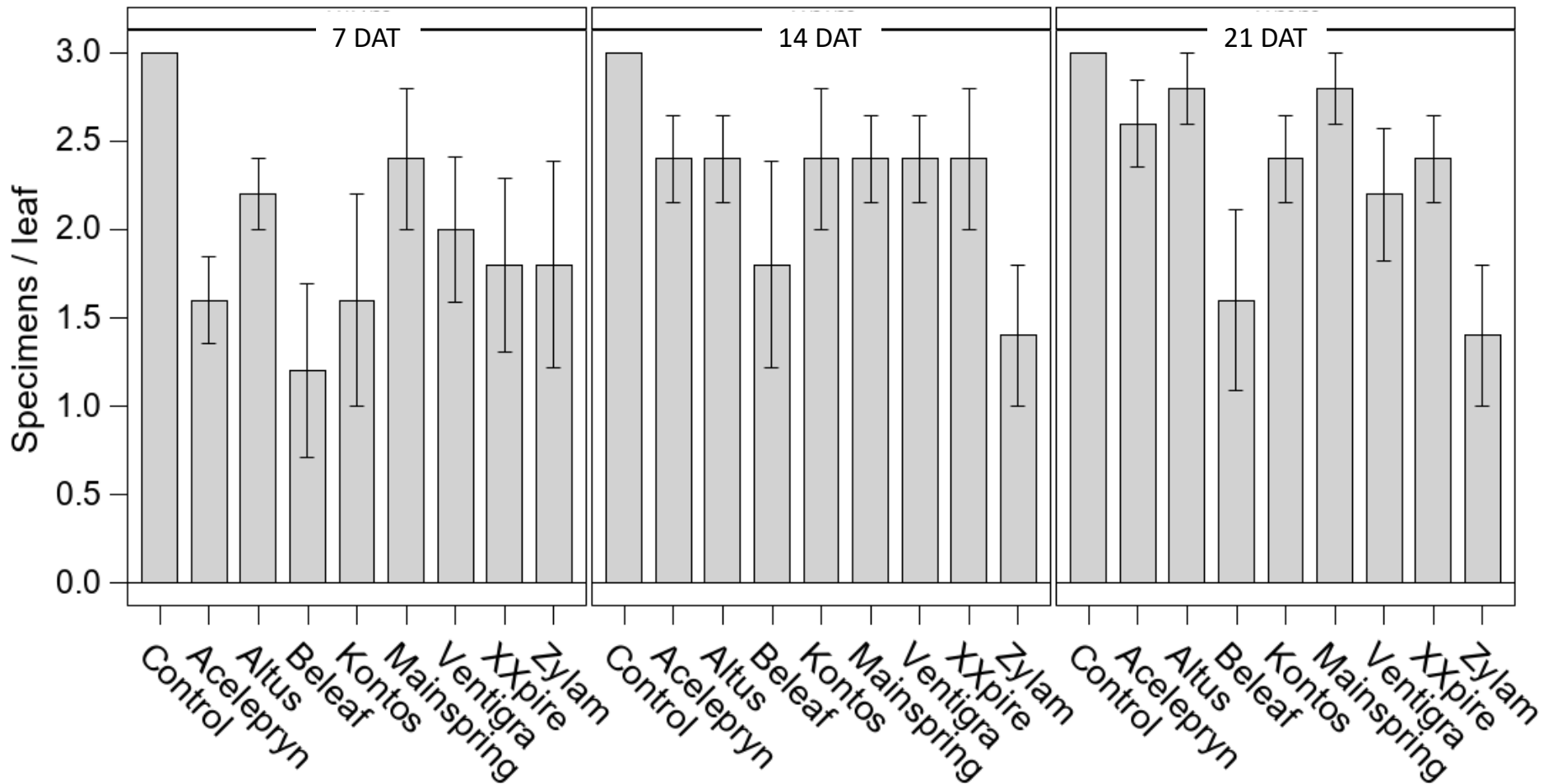
Potato aphid



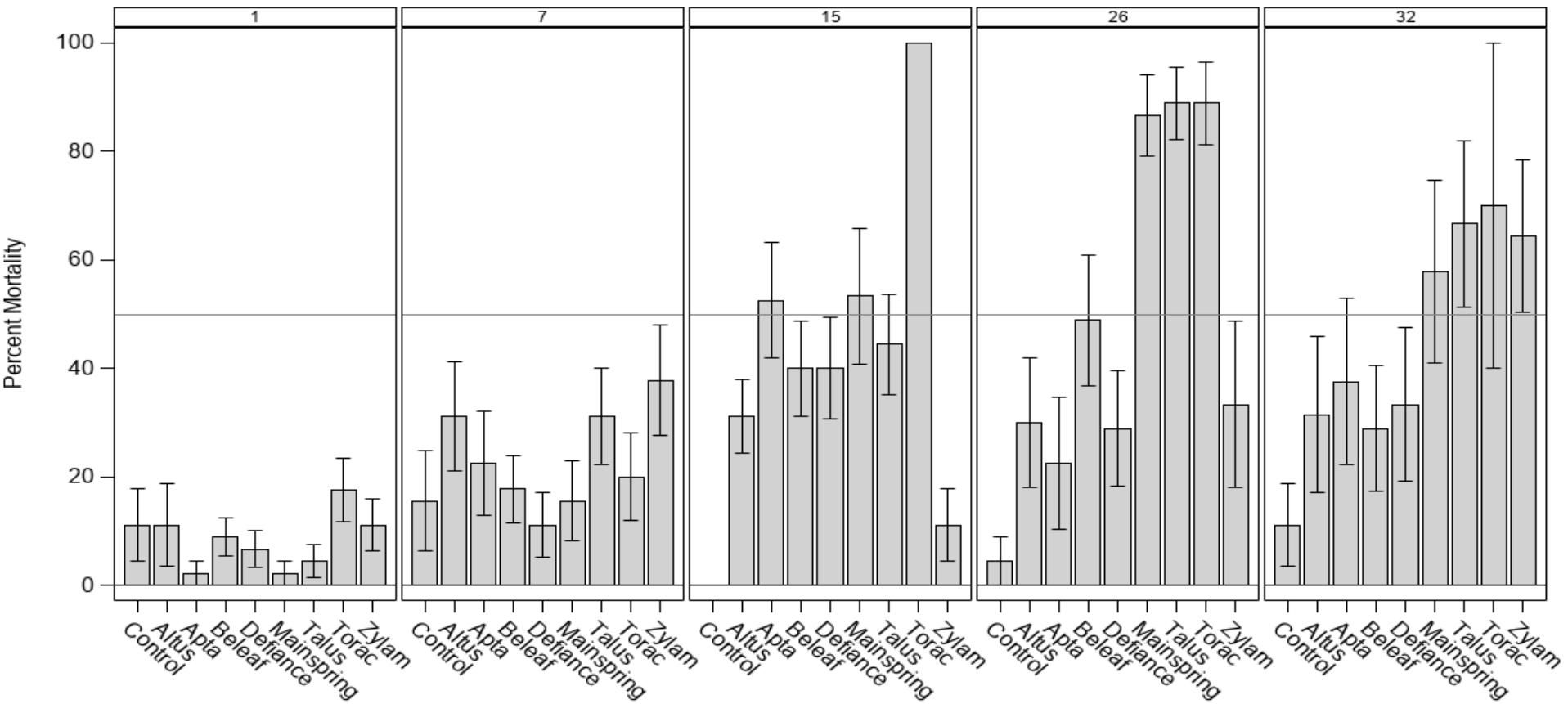
2019 lab bioassays: maximum label rates



Mealybugs in Poinsettias - drench



Japanese maple scale - bioassays



New active ingredients

- Afidopyropen (Ventigra) – Group 9D
- Combos
 - Spinetoram + Sulfoxaflor (XXpire) – Group 5 + 4

Update on the environmental and economic costs associated with alien-invasive species in the United States

David Pimentel*, Rodolfo Zuniga, Doug Morrison

In the US: Up to \$120 billion per year (losses + damage, cost of control)
By 2004: 50,000 invasive species

High and rising economic costs of biological invasions worldwide

Christophe Diagne^{1✉}, Boris Leroy², Anne-Charlotte Vaissière¹, Rodolphe E. Gozlan³,
David Roiz⁴, Ivan Jarić^{5,6}, Jean-Michel Salles⁷, Corey J. A. Bradshaw⁸ & Franck Courchamp^{1✉}

Worldwide from 1970 to 2017: Minimum reported \$1.288 trillion (cost of control)

Worldwide from 2000 – 2009: 83.3 billion per year

Tendency to increase costs

Red Imported Fire Ant (RIFA)

Solenopsis invicta

Identification:

About 1/16 to 1/4 inch

Stinger

Two-segmented waist

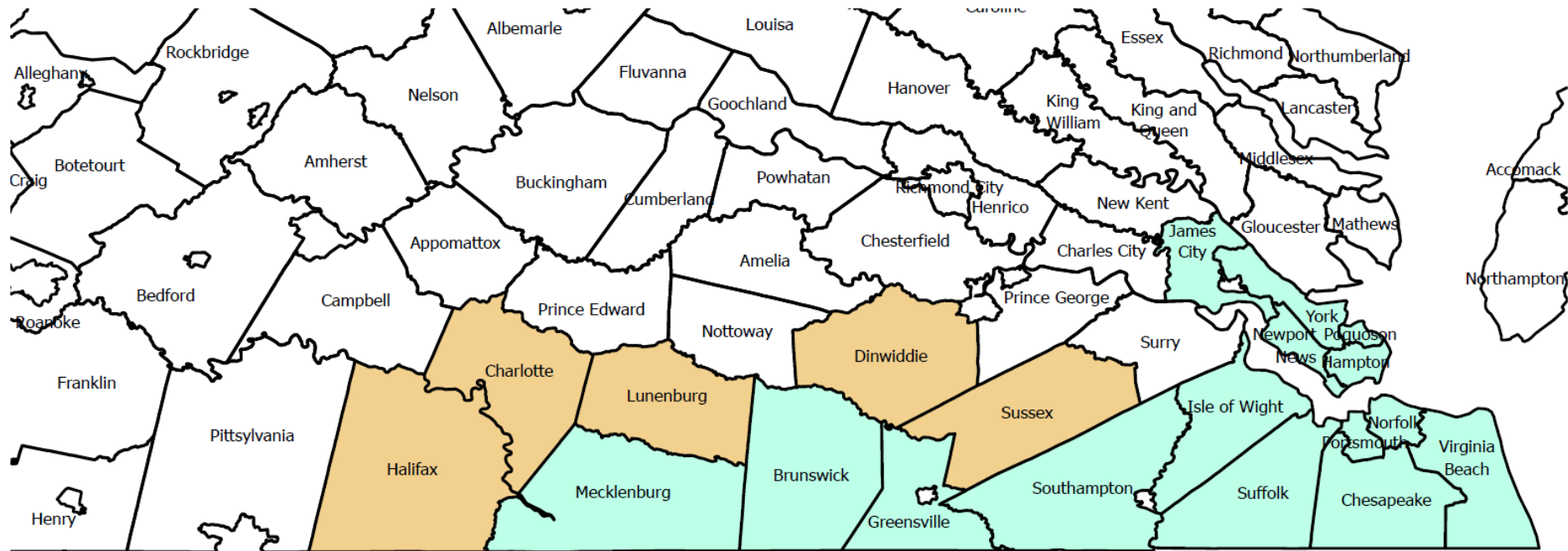


A. Wild



B. Drees

RIFA quarantine map



Additions in 2022



From 2009 to 2019

(VDACS 2022)

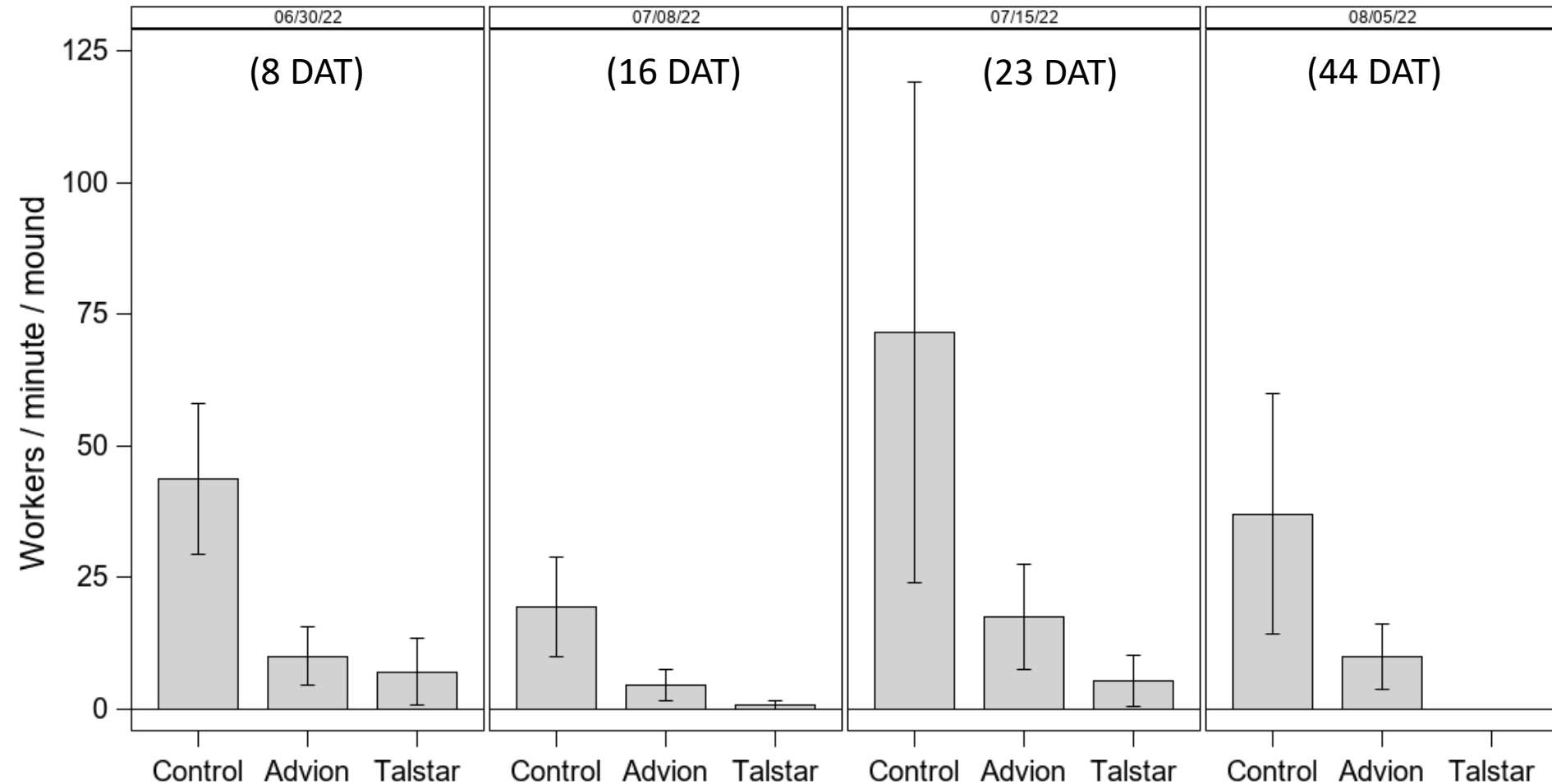
Red Imported Fire Ant Control

- Baits = Advion – Oxadiazine, Group 22, Indoxacarb
- Drenches = Talstar – Pyrethroid, Group 3, Bifenthrin

- Several mounds along a hiking trail
- Treatments deployed on 06/22/22
- Baits placed around mounds
- Drenches poured into mound entrance



Red Imported Fire Ant Control - 2022



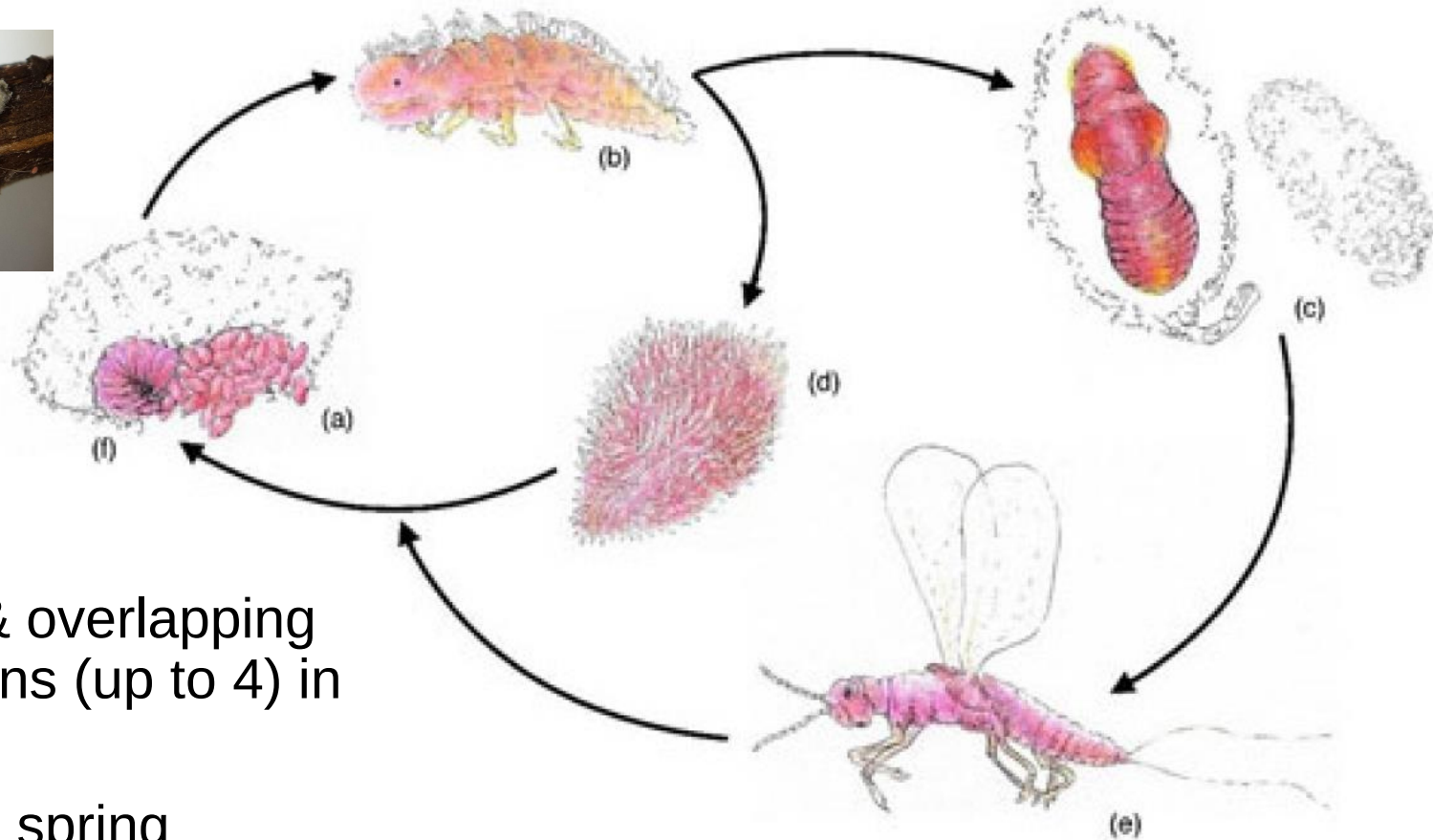
Crapemyrtle Bark Scale (CMBS)

Acanthococcus lagerstroemiae

Felt Scale: Family Eriococcidae
Native to east Asia



CMBS life history

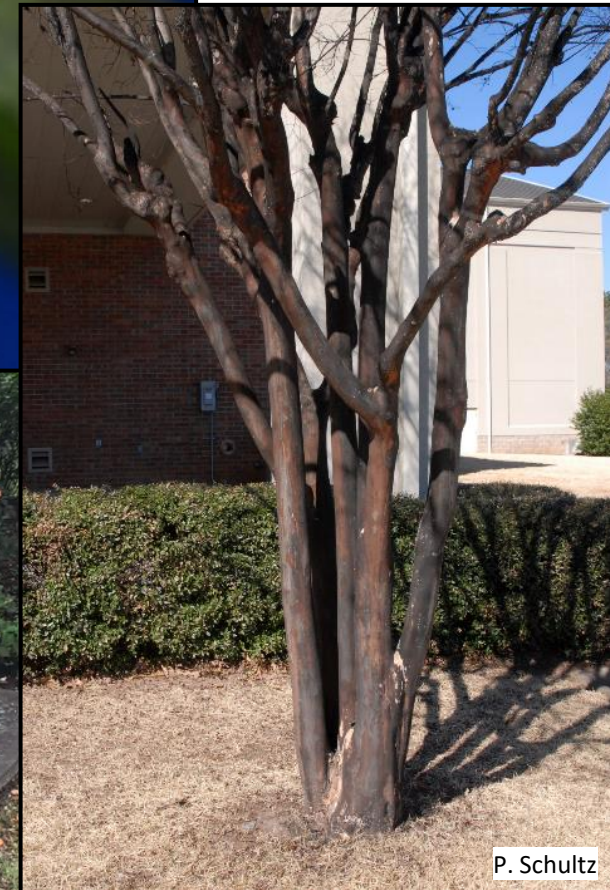


- Multiple & overlapping generations (up to 4) in Texas
- Crawlers: spring
- Sexual dimorphism
- Overwinter as nymphs

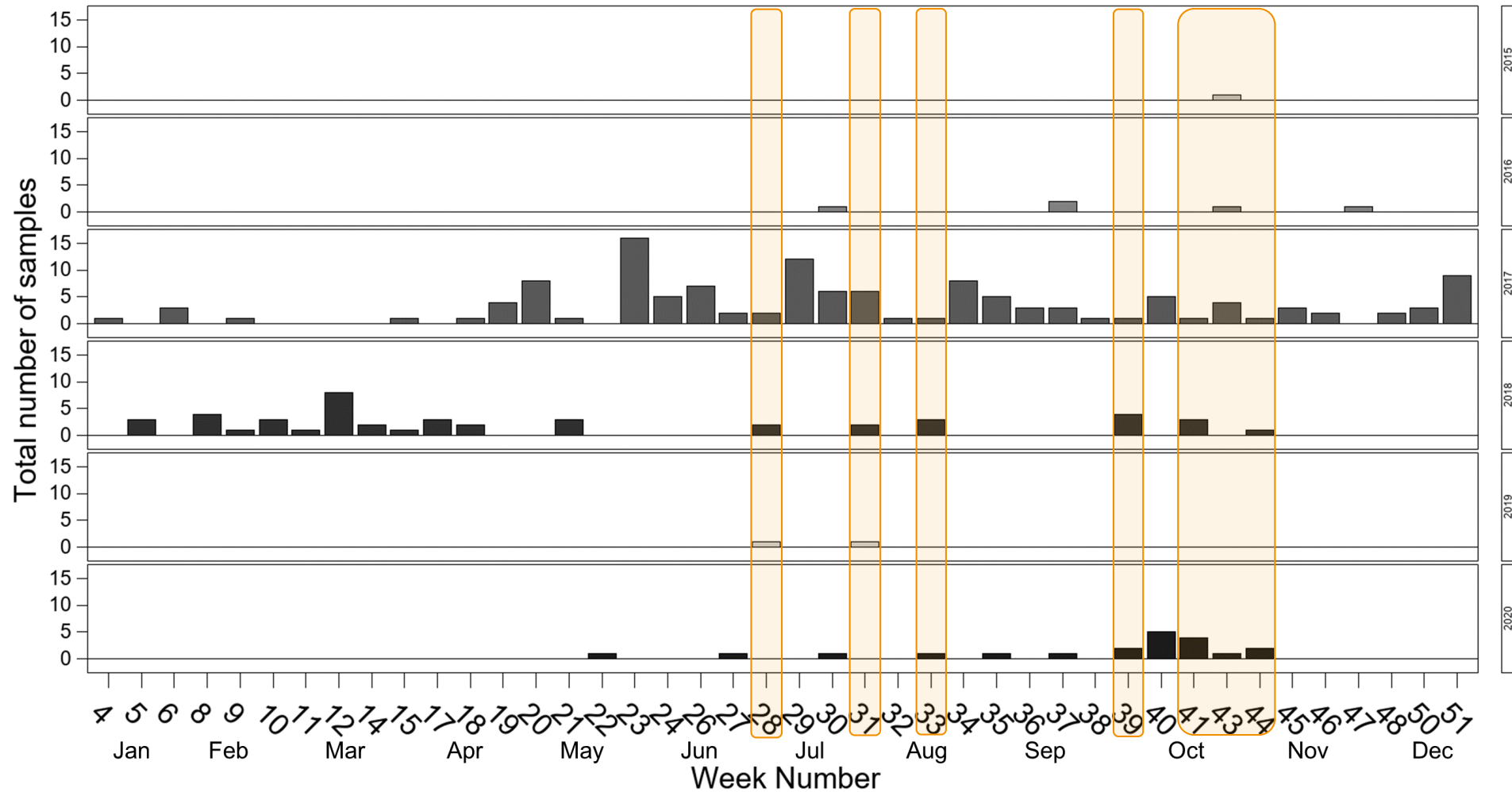
(A. Martin & X. Martini)

CMBS – Presence & Damage

- Crushing scales determines if alive
 - Pink hemolymph
- Direct:
 - Stress
- Indirect:
 - Honeydew
 - Sooty mold



CMBS in Hampton Roads, 2015-2020



Biological Control

- Lady beetle

Hyperaspis bigeminata
larvae and adults

Misidentified as CMBS



HUGE REWARD

Chemical Control

- Last resource
- Insecticidal soaps & oils
- Residential
 - Imidacloprid (Bayer Tree & Shrubs)
- Commercial
 - IGRs (Talus, Fulcrum) at crawler stage
 - Imidacloprid (Various Products)
 - Dinotefuran (Zylam, Transtect)



google.com



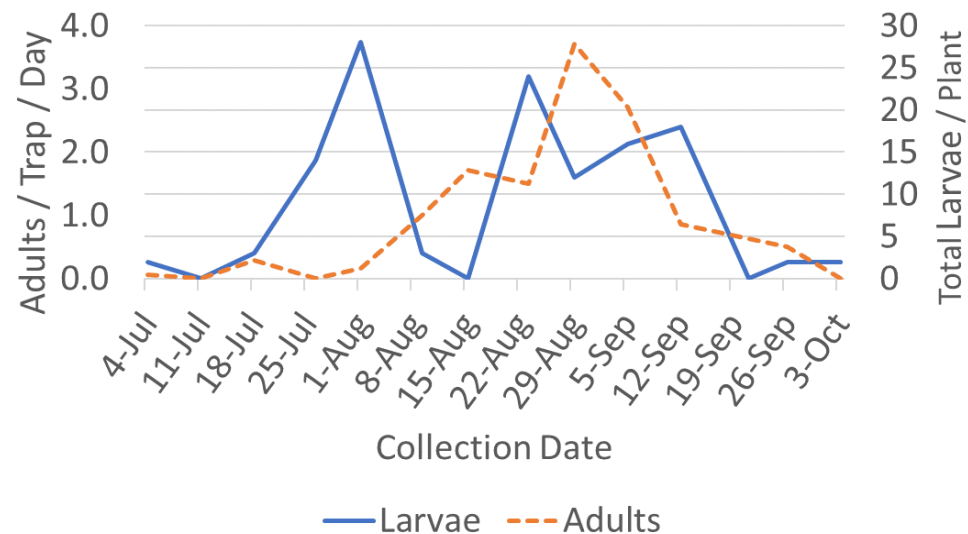
DoYourOwnPestControl.com

The Invader: Box Tree Moth



Box Tree Moth

- *Cydalima perspectalis* (Walker)
Lepidoptera: Crambidae
- Native to east Asia
- Germany: 2006
- Toronto, Canada: Aug 2018
- New York, US: Jul 2021
- 2 – 3 generations / year
- Overwinters as 3rd instar



The brown marmorated stink bug

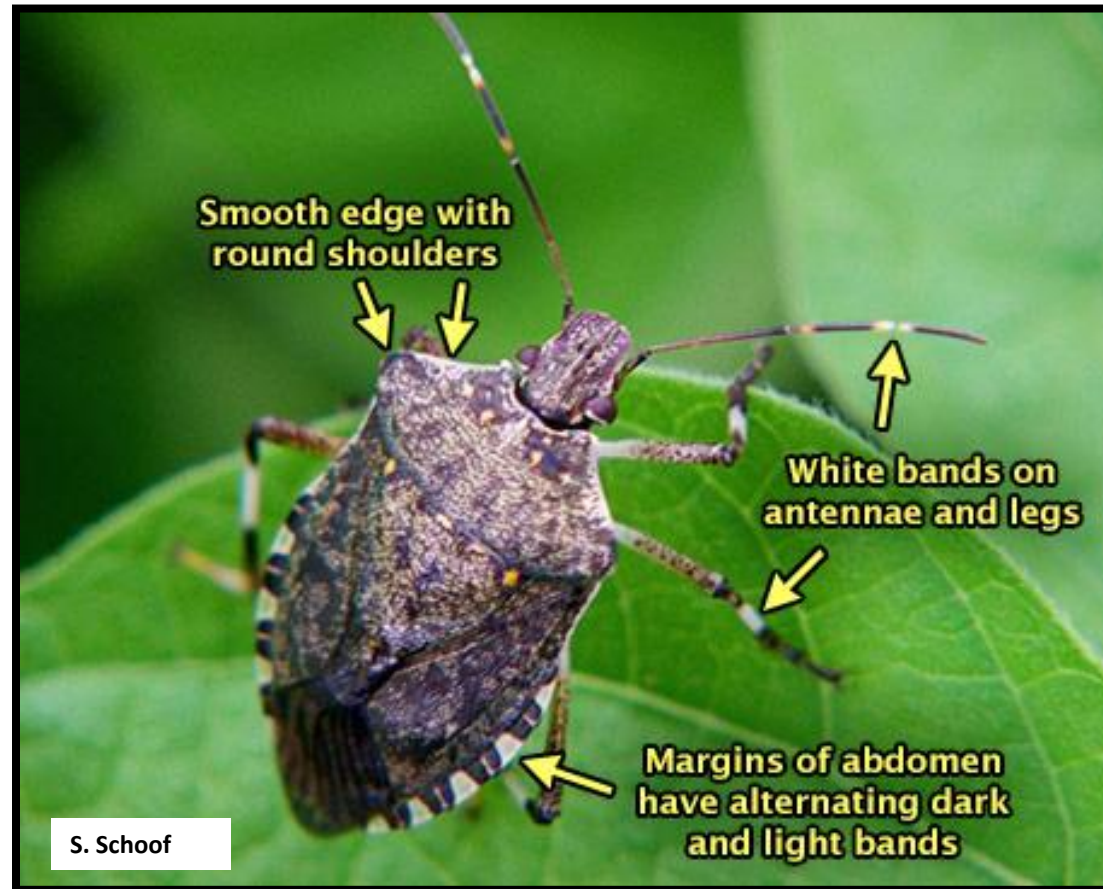
Halyomorpha halys

Phloem feeders

Introduced in 1998

Up to two generations

Overwinters leaf litter
man-made buildings



BMSB as nuisance



Lower image courtesy University of Illinois Extension

Get out of my home!

- NO. Do not use insecticides
- Seal cracks, crevices
- Change window screens
- Use shop-vac with soapy water



Elm Zigzag Sawfly (EZS)



Aproceros leucopoda

Hymenoptera

Native of east Asia



Final Thoughts

- Several groups of insects present in the landscape
 - Biology and natural history inform our decisions
- Fluctuations of insect populations influenced by several factors
 - Environmental Conditions
 - Available Food
 - Management Practices
- Invasive species are costly
- IPM aid to reduce both environmental and economical risks
 - Chemical Control
 - Cultural / Alternatives

A photograph of a well-maintained garden. In the background is a two-story yellow brick house with blue shutters and a white porch. The porch has a small table and chairs, and red flowers are hanging from the railing. A large green vine covers the wall to the left of the porch. In the foreground, there is a lush green lawn. To the left and right of the lawn are flower beds filled with red, pink, and yellow flowers. A white picket fence runs along the back of the garden, and a large green tree stands behind it.

Questions?

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