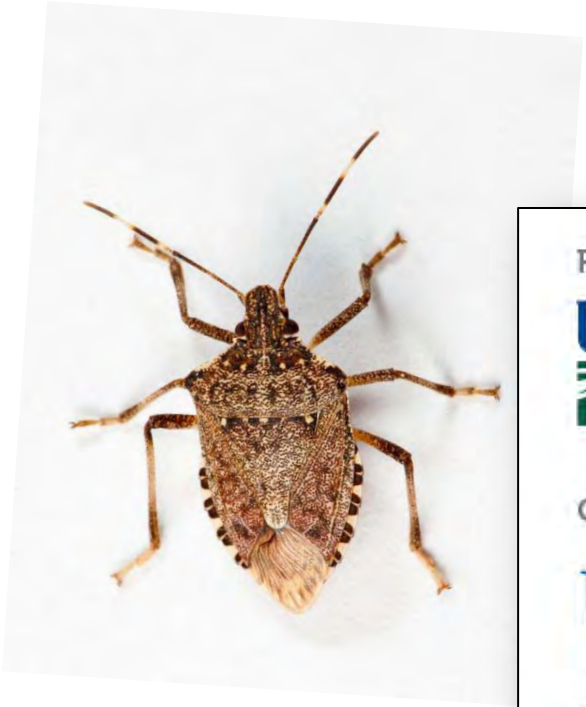
3.1 IPM in Orchard Crops



Funding

USDA United States Department of Agriculture

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Specialty Crop Research Initiative

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Collaborating Institutions

University of Delaware

ars

Penn State

The State University of New Jersey Rutgers

Northeastern IPM Center

Washington State University

Cornell University

University of Maryland

VirginiaTech

OSU Oregon State University

NC State University

StopBMSB.org

Integrated **P**est **M**anagement in many eastern orchards has been severely impacted

- At present, IPM is mainly about Integrated Pesticide Management to: 1) mitigate BMSB effects, 2) manage other pests, 3) manage insecticide resistance, & 4) minimize 2^{o} pest outbreaks
- Some pre-BMSB recommendations still relevant
- New/revised recommendations regarding product selection & timing predicated on new information from BMSB research & observations in the field
- Differences between pome & stone fruit

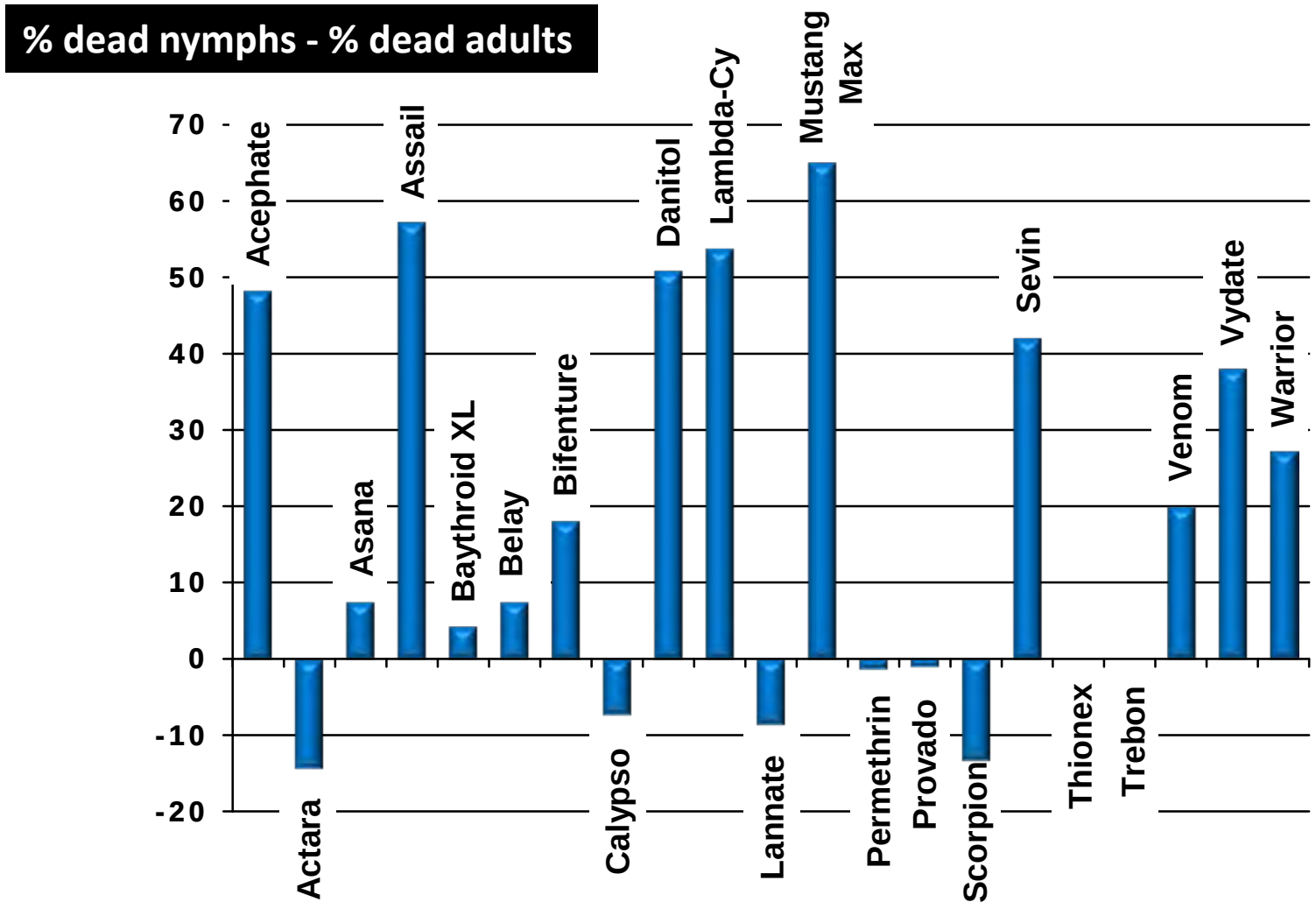
1:

Target mite eggs, San Jose scale and woolly apple aphid in prebloom

2:

In pome fruit, target first wave of overwintered adults & their progeny starting late May (in a “normal” year)

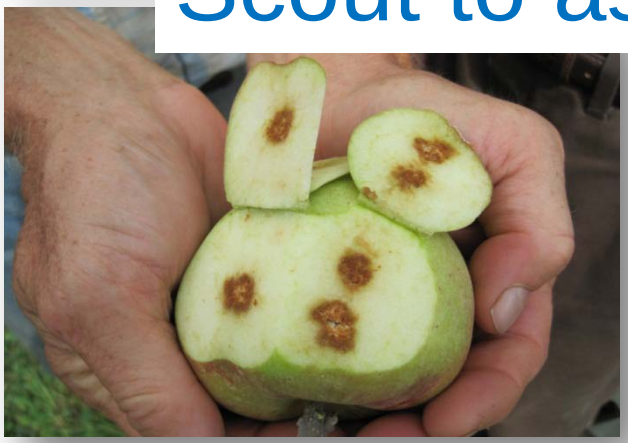
- Overwintered adults may be more susceptible to insecticides than later generation(s)
- Nymphs generally more susceptible than adults

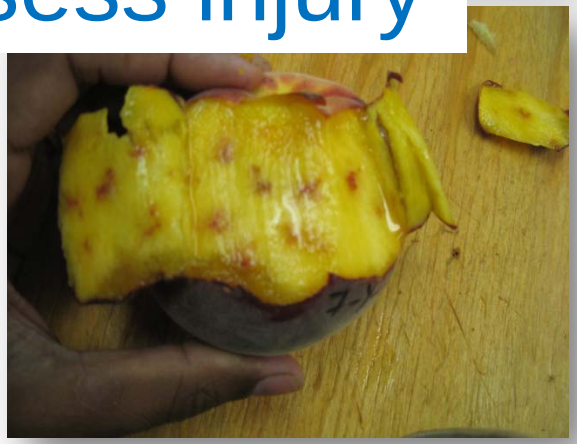


From T. Kuhar, 2011

3:

Scout to assess injury

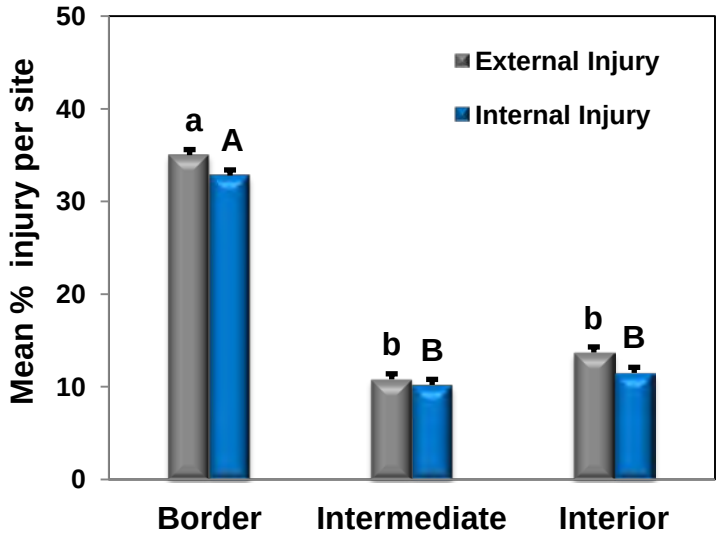


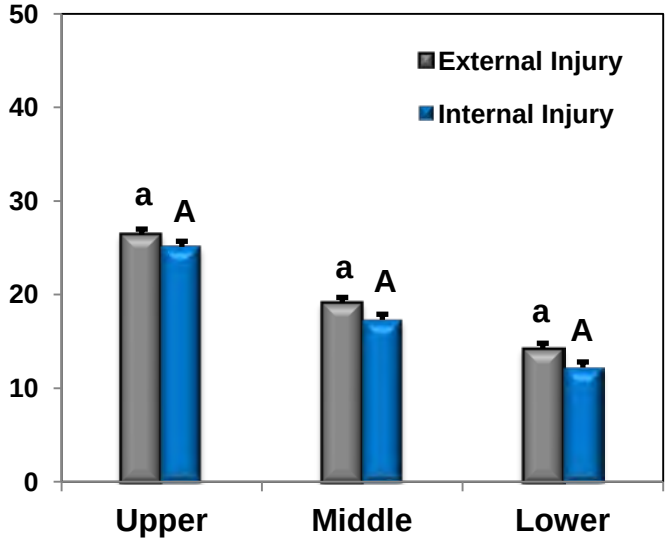


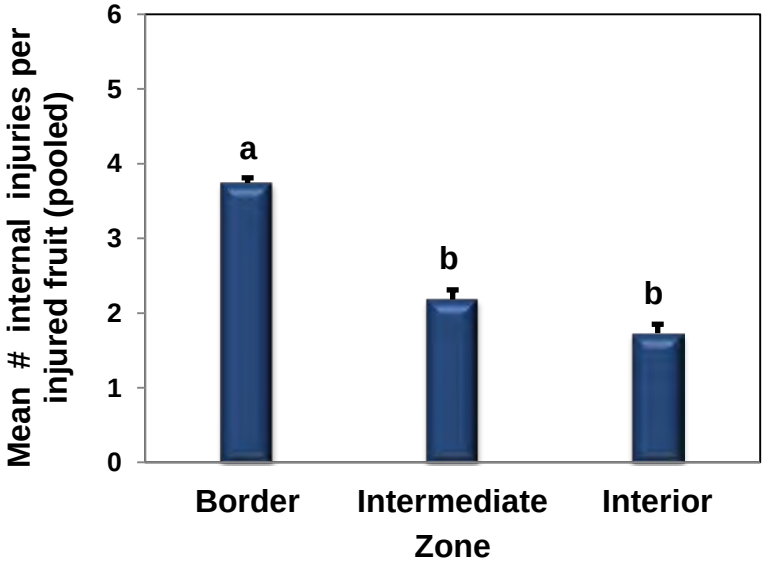
- Start late June
- Monthly thereafter?
- Assess outside & inside of fruit

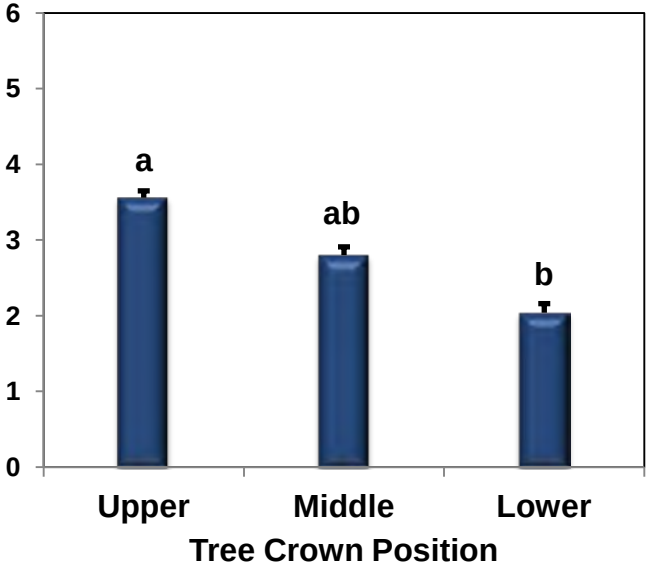
- Start mid- to late May
- Gummosis from early injury
- Bi-weekly thereafter?
- Later injury may not show externally

Apples from the upper canopy of trees in rows adjacent to woodland may show injury earliest



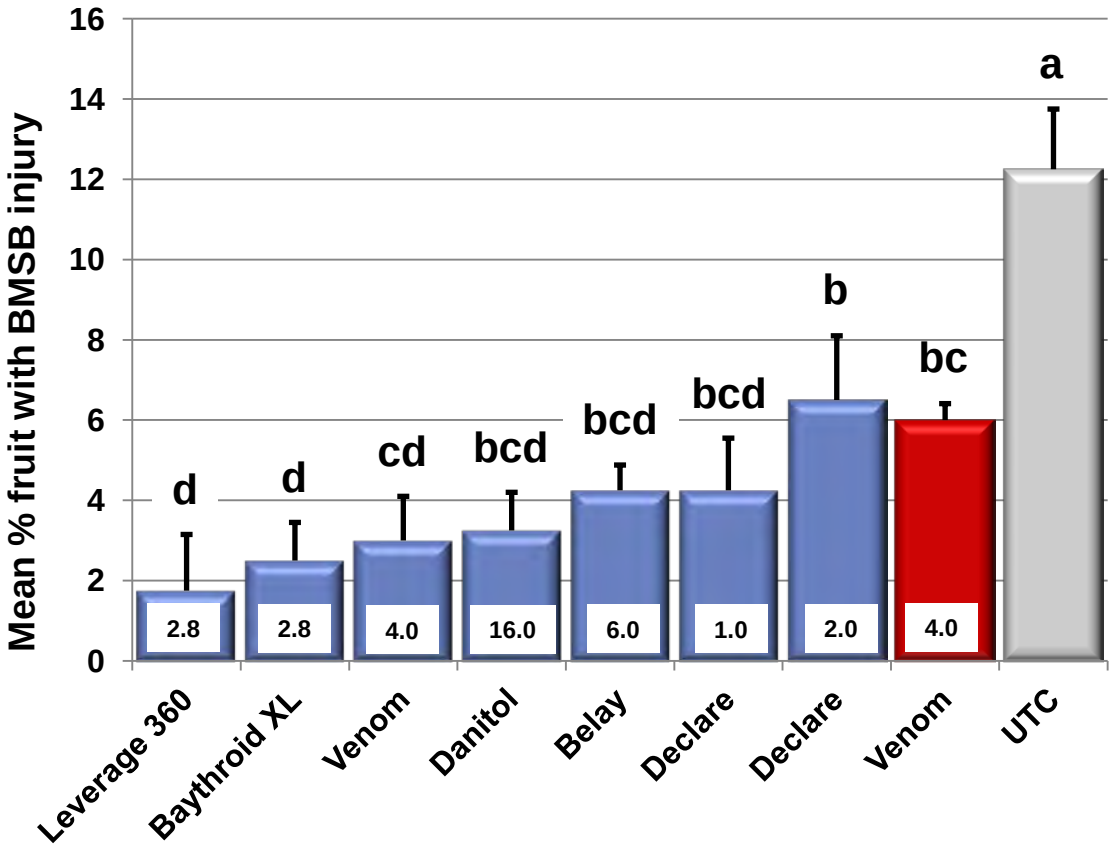






4:

Alternate-row-middle sprays through much of season



Rotate among classes

- BMSB may not be as prone to insecticide resistance due to extensive refugia, although other pests likely are
- Maintain effective programs against CM and/or OFM
  (According to thresholds, DD models, & spectrum of activity)
- Tank-mixed or premixed products

6:

In apples, reserve products most prone to incite 2^{o} pests (& most effective against BMSB) until late season

- Anecdotal reports of predatory mites tolerating pyrethroids
- Instances of San Jose scale and woolly apple aphid (late season) outbreaks
- Use Section 18 products (hopefully) wisely

Suggestions for future research

- Resistance monitoring in adult BMSB populations
  - Baseline susceptibility
  - Effects of selection pressure
  - Resistance stability
- Generational changes in susceptibility within seasons
- Susceptibility of predatory mites to pyrethroids
- Management decisions based on BMSB monitoring & developmental models
- Tactics based on behavioral manipulation