



U.S. DEPARTMENT OF AGRICULTURE
Agricultural Research Service



Invasive and Emerging Pests and Pathogens





- **Critical Issues**
 - Trunk Diseases
 - Brown Marmorated Stink Bug
 - Exotic Pests





- **Trunk diseases** (Eutypa dieback, Botryosphaeria canker, Esca, Phomopsis cane and leaf spot) cause significant impacts to yield and vineyard longevity in established growing regions of the US. Annual losses to Eutypa dieback and Botryosphaeria canker equal 14% of the gross producer value for CA winegrapes, and do not even take account of losses suffered by CA raisin and table grape producers or growers outside CA. For a single disease problem to account for such a large proportion of production value, and with rapid expansion of new plantings in emerging production regions, it is clear that grapes are and will continue to be at risk from trunk diseases. For a single disease problem to account for such a large proportion of production value, and with rapid expansion of new plantings in emerging production regions, it is clear that grapes are and will continue to be at risk from trunk diseases.
- **Outcomes:**
 - Submit planning proposal to SCRI in January 2011.
 - Assemble team of ARS and university researchers, extension advisors, and industry cooperators to support the research.
 - Identify short-term and long-term management solutions for trunk diseases.

Brown Marmorated Stink Bug

Halyomorpha halys (Stål)



2010 Damage Survey in Mid-Atlantic Tree Fruit Orchards



Adult and Nymphal Feeding and Damage on Peach

July 21, 2010

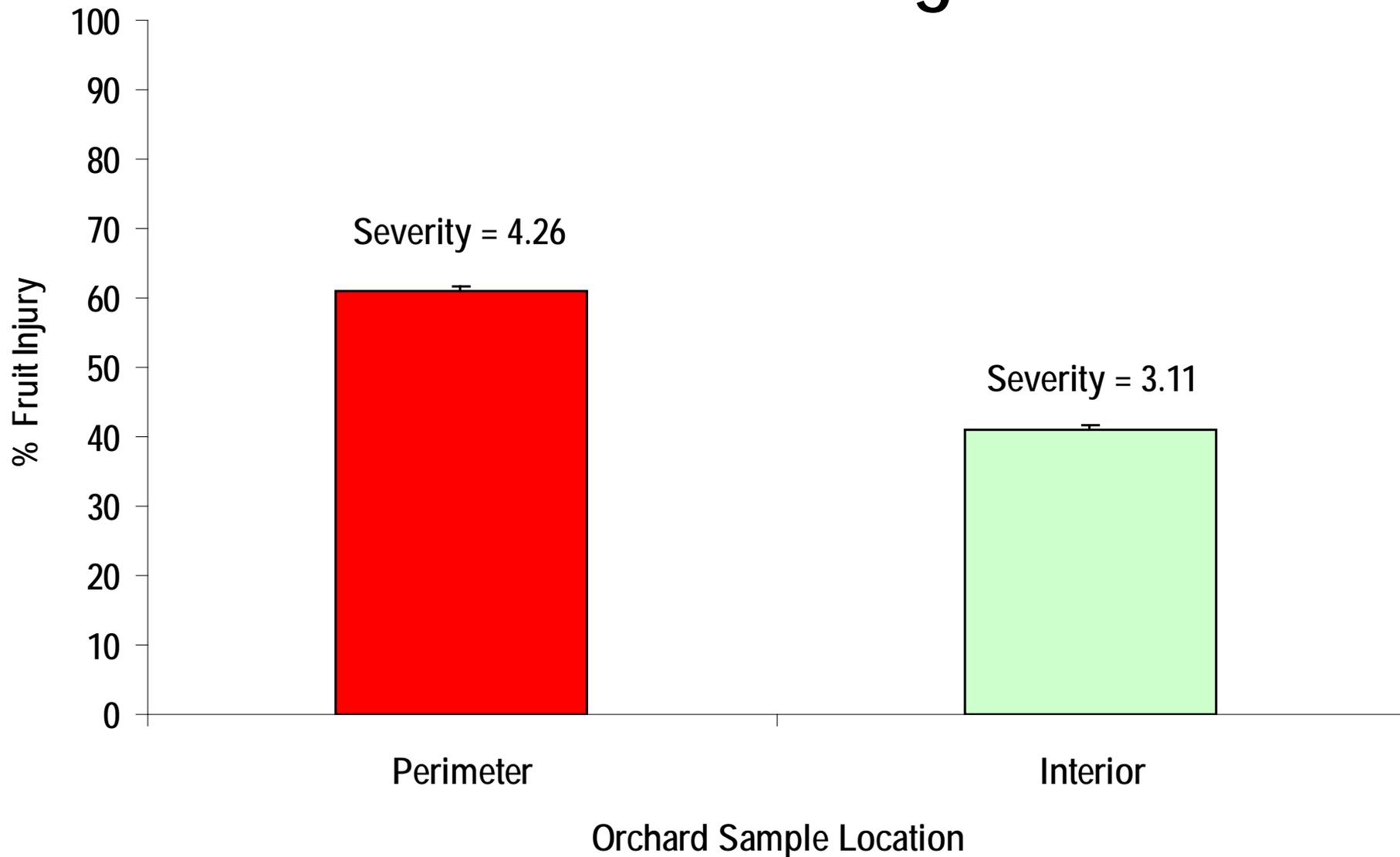


Adult and Nymphal Feeding on Tomato Early-Mid August 2010

Photos courtesy of Clarissa Mathews, Shepherd Univ. and Ames Herbert, VA Tech.



Results From Commercial Apple Orchards in Mid-Atlantic Region





- BMSB emerged as a season-long threat to commercial tree fruit. Both adults and nymphs cause damage.
- Even with aggressive treatment, severe economic injury was present.
- Smaller populations also can be quite damaging.
- Adult captures in traps are not reflective of in-orchard activity.
- BMSB enter orchards from the outside, but if populations are left unchecked, reproduction can occur within the orchard.





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- BMSB likely can use grape as a reproductive host. Adult and nymphal presence and damage was detected in table grapes.
- For winemakers, adult and nymphal presence in lugs at harvest. Perceptible taint by at least on winemaker.
- BMSB likely contributed to increased late season fruit rots. Even in such a dry year, there was a significant presence of rot in some vineyards.
- Vector diseases of grape?
- Based on the ability of BMSB to utilize a broad host range and the observations made in 2010, there is a strong likelihood for this insect to affect grapes grown for table, juice, wine, and raisin consumption.
- This insect appears to have the potential to establish in different regions of the country, contributing to the threat.





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- **Desired Outcomes for BMSB**
 - Limit Spread
 - Education
 - Create a Excellent Team
 - Obtain Funding
 - Develop Management Solutions
 - Industry Involvement





- **Limit Spread**

- **Objectives**

- Define basic biology, behavior, ecology, and phenology of BMSB to understand potential for spread and establishment.
 - Develop mitigation strategies to limit spread.
 - Long-term biological control efforts – whether predator, parasitoid, pathogen to reduce or eliminate populations.

- **Leaders for objective**

- ARS-Kearneysville, Newark, and Beltsville
 - UMD, PSU, VA Tech., Rutgers, Cornell, OSU, NC State, and UDel





- Education

- Objectives

- Raise awareness among grower community to be aware of risks and potential problems.
 - Raise awareness among the public (potential for accidental introductions into new regions)

- Leaders for objective

- Northeast IPM Center
 - ARS-Kearneysville, Newark, Beltsville
 - UMD, PSU, VA Tech., Rutgers, Cornell, OSU, NC State, UDel





- Create a National Team

- Objectives

- Assess pest problems within grape and other affected crops.
 - Develop strategies that are applicable within and across crops.

- Leaders for objective

- ARS-Kearneysville, Newark, Beltsville
 - UMD, PSU, VA Tech., Rutgers, Cornell, OSU, NC State, UDel





- Obtain Funds

- Objectives

- Develop multi-disciplinary proposals to target specific crops as well as information applicable across crops.
 - Currently, NIFA Critical Issues grant and NE-IPM Working Group Grants Funded in 2010.
 - SCRI, AFRI, Regional IPM Proposals, as well as other funding programs being targeted.

- Leaders for objective

- ARS-Kearneysville
 - Rutgers





- **Management Solutions**

- Objectives

- Short-term, emergency stop-gap solutions to mitigate severe economic injury within the crop to keep industries viable.
 - Longer term solutions that offer more sustainable approaches such as “attract and Kill” technologies and biological control.
 - Strategies to mitigate risk of taint to wine and juice due to presence of bugs at harvest.

- **Leaders for objective**

- ARS-Kearneysville, Newark, Beltsville
 - UMD, PSU, VA Tech., Rutgers, Cornell, OSU, NC State, UDel





- Industry Involvement

- Objectives

- Direct involvement with research in terms of developing solutions

- Leaders for objective

- US Apple
 - Peach Council
 - State Horticultural Associations





- **Resources currently available**

- **Expertise**

- Entomology, behavior, ecology, chemical ecology, biological control (predators, pathogens, parasitoids), modeling, physiology/genetic mechanisms associated with plant defense, vector biology.

- **Equipment and facilities**

- ARS facilities in Kearneysville, WV, Newark, DE, and Beltsville, MD
- LGU facilities at UMD, PSU, VA Tech., Rutgers, Cornell, UDel, OSU, and NC State

- **Funds**

- ARS programmatic funding
- Northeast IPM Center (Working Group)
- NIFA Critical Issues Grant





• Final Conclusions – Exotic Pests

- Recurring problem with invasive and emerging pests and diseases
- Improvements for early detection
- Determining how long we have between detection and economic loss (lag phase)
- How we can be better prepared by threats posed by invasive and emerging pests and disease.

