1.4 - Identify landscape and temporal risk factors associated with BMSB on crops and in adjacent ecosystems

Funding

USDA United States Department of Agriculture

National Institute of Food and Agriculture

Specialty Crop Research Initiative

Grant #2011-01413-30937

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

Virginia Tech

OSU Oregon State University

NC State University

Stop BMSB.org

The Players

- Rutgers
  - George Hamilton
  - Dean Polk
  - Cesar Rodriguez-Saona
- University of Maryland
  - Brian Butler
  - Galen Dively
  - Holly Martinson
  - Michael Raupp
  - Paula Shrewsbury
- Oregon State
  - Peter Shearer
  - Silvia Rondon
  - Vaughn Walton
- Penn State University
  - Shelby Fleischer
  - John Tooker
- Virginia Tech
  - Doug Pfeiffer

The Crops Being Examined

- Oregon State
  - Hazelnuts
  - At risk vegetables
- Penn State
  - Tomatoes
  - General Public
- University of Maryland
  - Nurseries
  - Sweet corn
- Rutgers
  - Apples
  - Blueberries
  - Grapes
  - Peaches
  - General Public
- Virginia Tech
  - Grapes
  - Other Small Fruit

1.4 - Identify landscape and temporal risk factors associated with BMSB on crops and in adjacent ecosystems

- Outcomes
  - Determine why and when BMSB leave one host plant for another
  - Determine where BSMB go when they leave
  - Predict BMSB seasonality and risks to other crops
- Methods
  - Monitor movement in and out of fields related to surrounding landscape
  - Monitor movement within fields
  - Techniques – black lights, visual counts, beating, traps, mark-recapture, homeowner reports
  - Map using GIS and geostatistics

Work to Date

- MD Nurseries
- NJ Peach Orchards
- PA/NJ Homeowner Reports

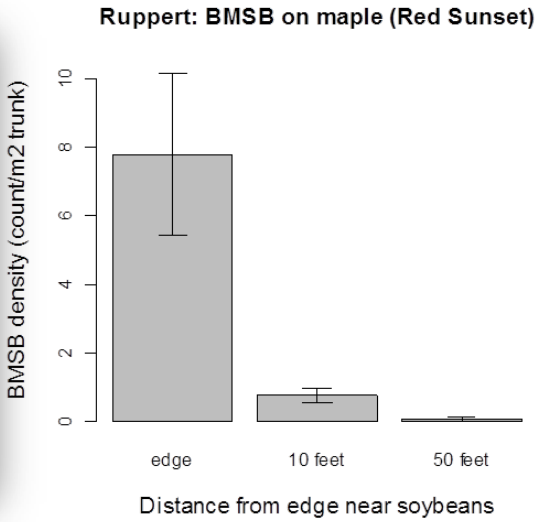
Landscape and temporal risk factors associated with BMSB in nurseries and in adjacent ecosystems

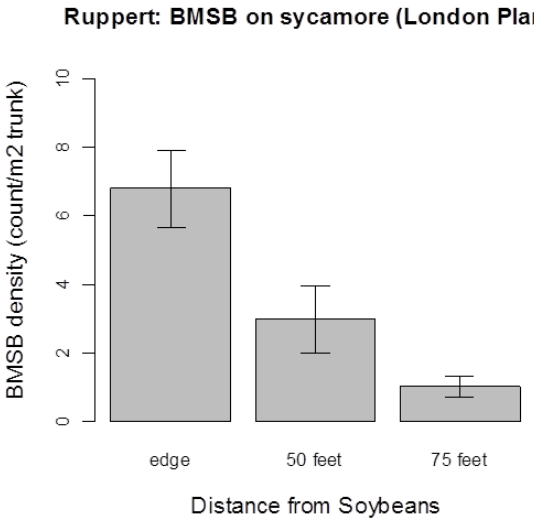
2010 & 2011 Data

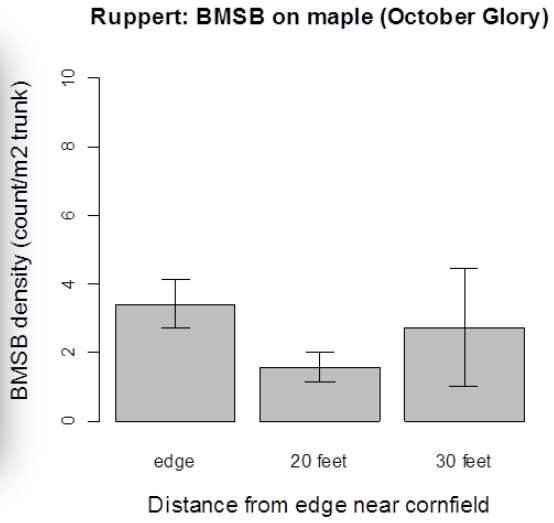
Martinson, Bergmann, & Raupp

University of Maryland

2010 Pilot Study







Ruppert Nursery, Montgomery Co., MD

-Surveyed BMSB on trees at varying distances from field edges

Survey Methods

2011 Nursery Surveys

1 minute visual counts for each plant part:

Leaves ▪ Fruit ▪ Bark (up to 2 m)

BMSB stages:

Egg clusters▪ Early nymphs ▪ Late nymphs ▪ Adults

Dataset 1: All plants, Surveyed 4 times:

June 2 – August 2, 2011

2006 individual trees, 178 cultivars,

7578 tree visits

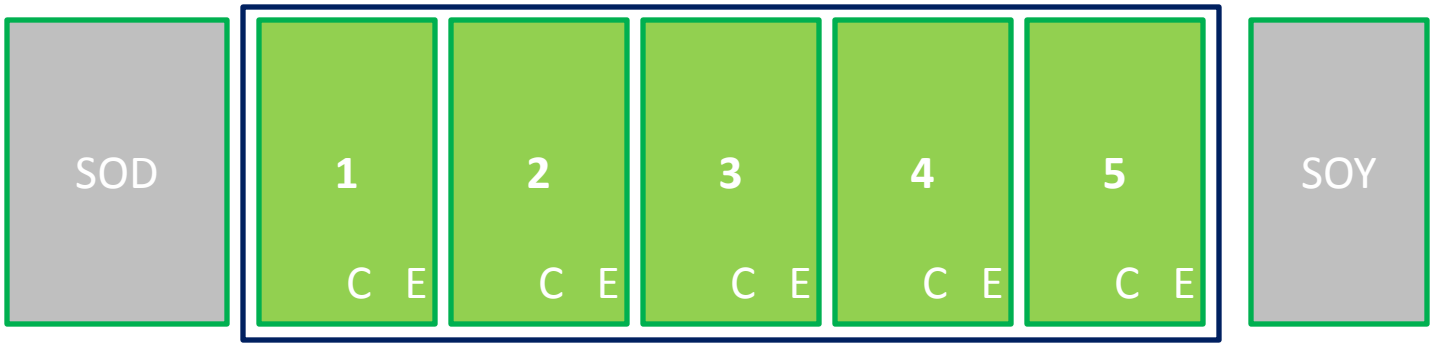
Dataset 2: Subset of all plants: Surveyed 9 times: June 2 – October 10

217 individual trees, 25 cultivars,

1953 tree visits

2011 Spatial Patterns

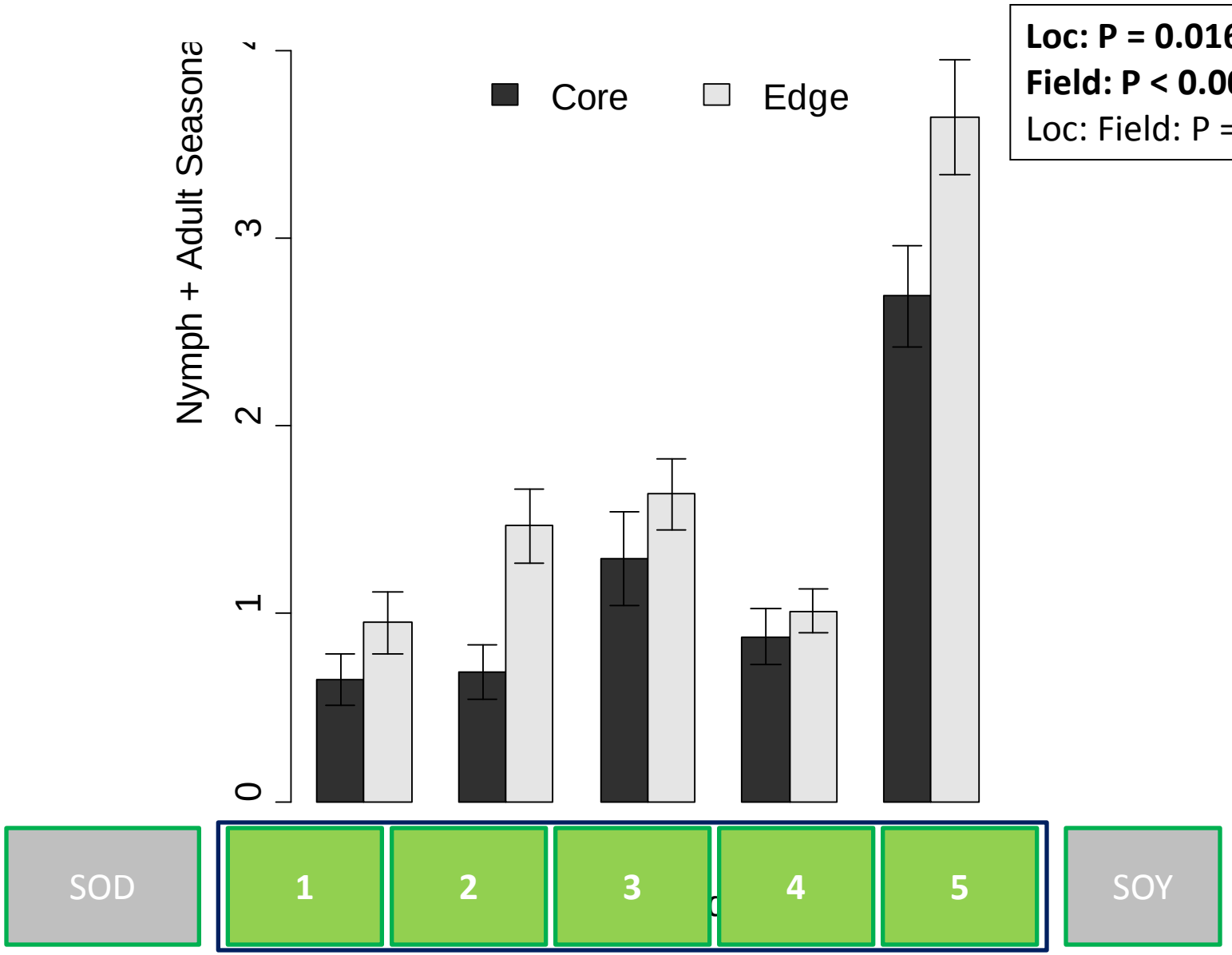
Edge effects?



Edge Tree (E): 1-3 positions from field edge
Core Tree (C): 9-15 positions from field edge

<u>Hypotheses:</u>

Fields will differ in densities due to adjacent habitat type (field effect).
BMSB counts will be higher on edge trees (position effect).
The strength of the edge effect will vary with field (interaction).


Loc: P = 0.016
Field: P < 0.001
Loc: Field: P = 0.17
Core
Edge
Nymph + Adult Seasona
0
1
2
3
SOD
1
2
3
4
5
SOY

Landscape and temporal risk factors in nurseries

- Preliminary Results
  - Edge effects where identified in relation to corn and soybeans
  - Significant location and field effects where found
- Pitfalls Encountered
  - None Identified
- Follow-up Studies
  - Repeat 2011 study in 2012
- Expected Outcomes
  - Use landscape factors to target pest management actions

Landscape and temporal risk factors associated with BMSB in peaches and in adjacent ecosystems

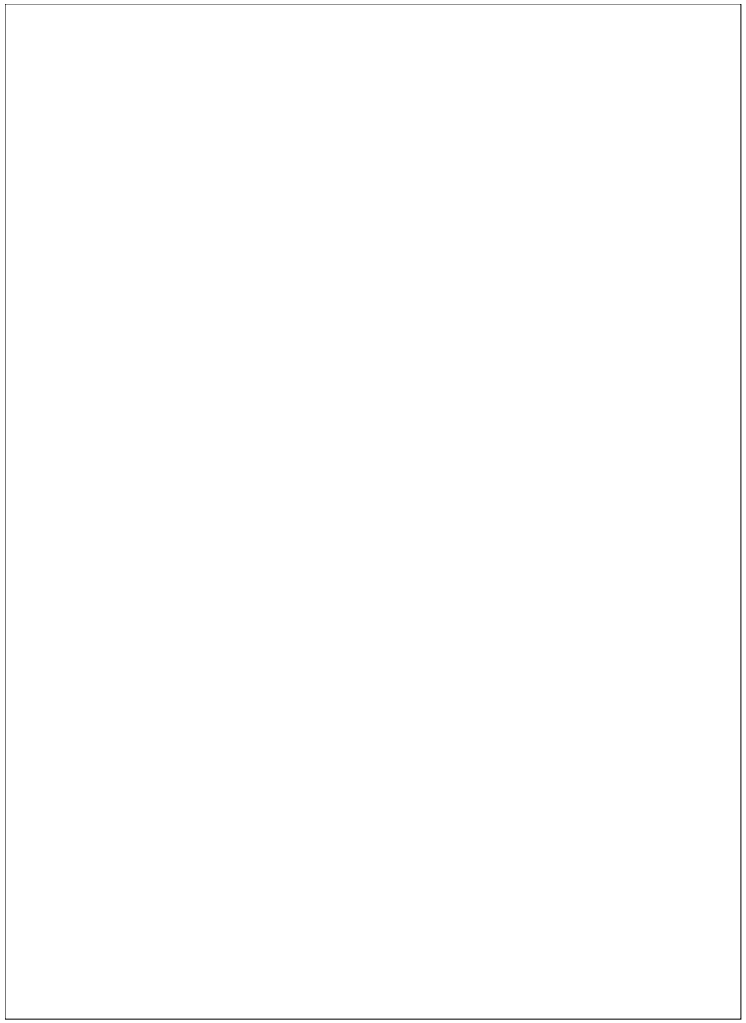
Noel Hahn, Dean Polk

& George Hamilton

Rutgers University

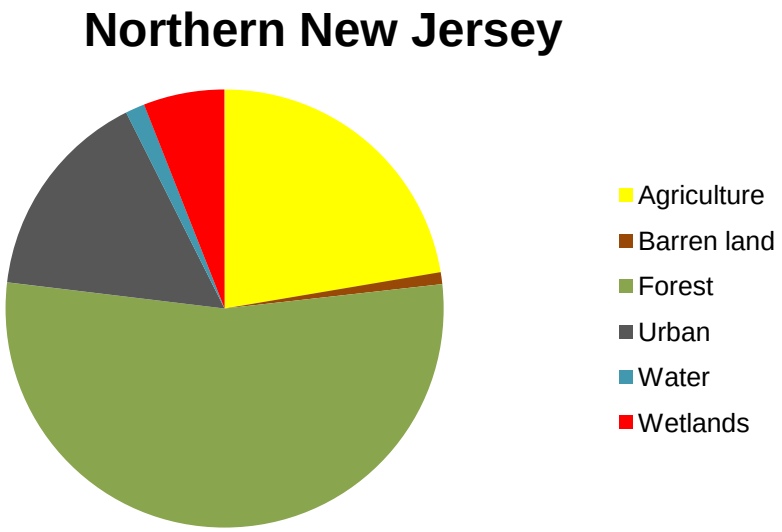
Effect of Surrounding Landscape

- Selected 23 orchards based on surrounding landscape (10 south, 13 north)
- Weekly visual and beat samples
- Correlate densities with surrounding cover

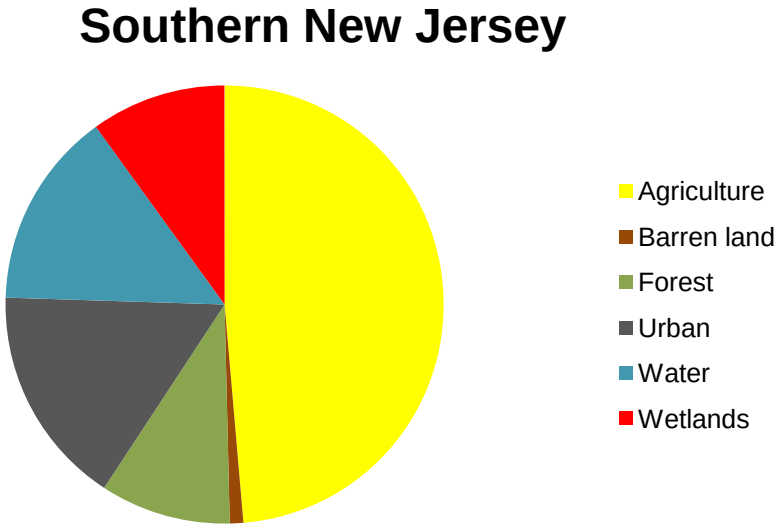


Land cover

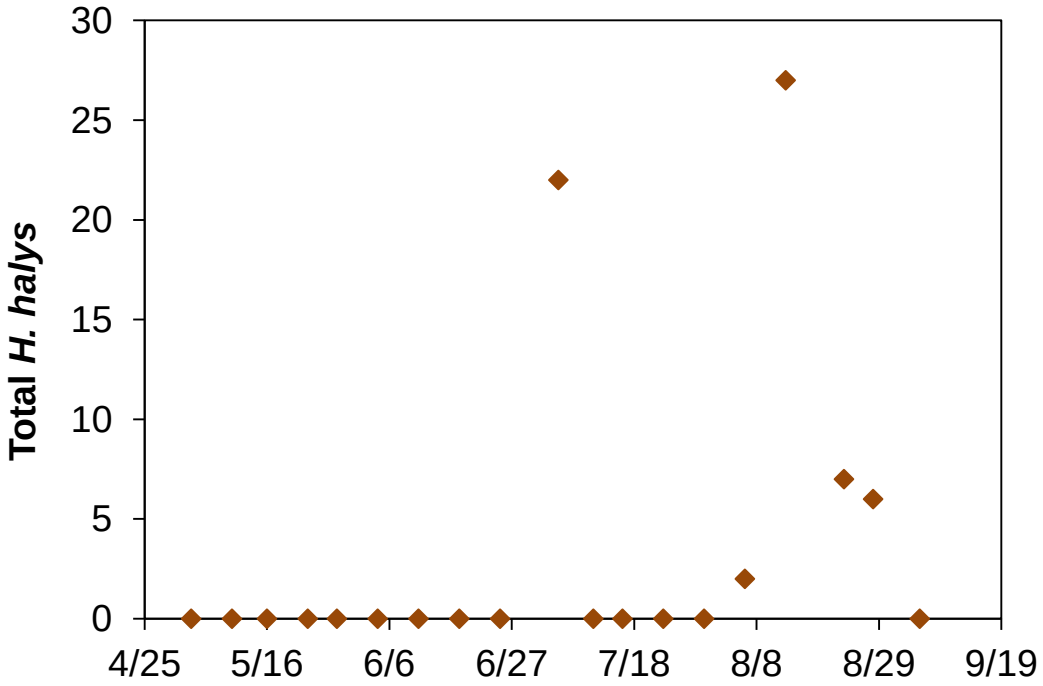
The aggregate landscape land cover was summed for all 13 farms in northern New Jersey



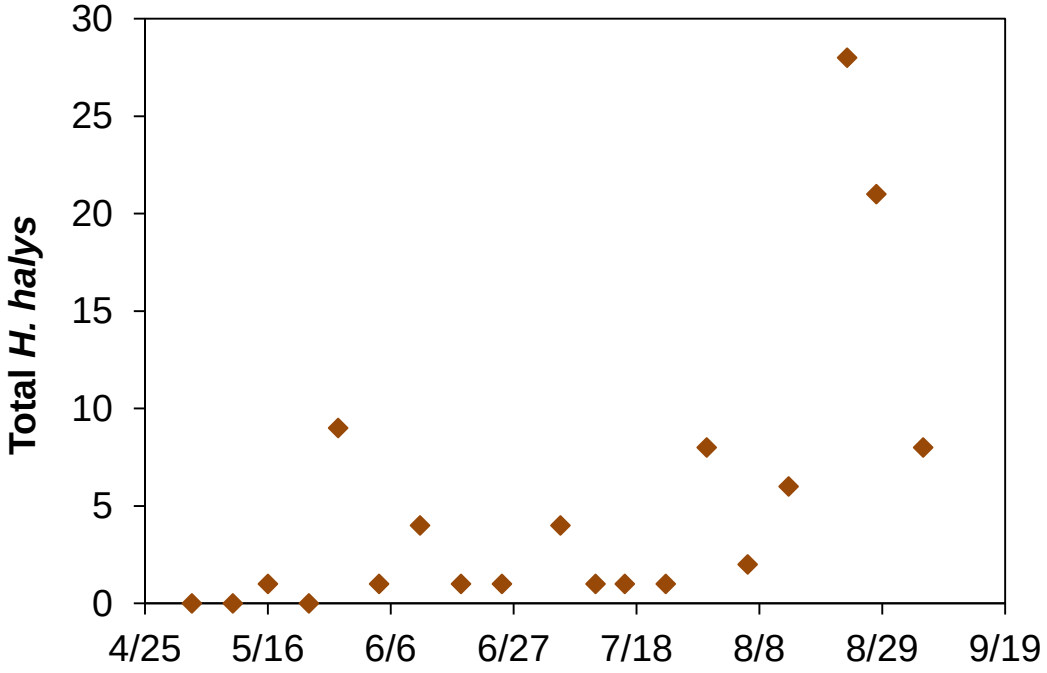
Aggregate land cover was also summed for all 10 farms in southern New Jersey



Nymphs

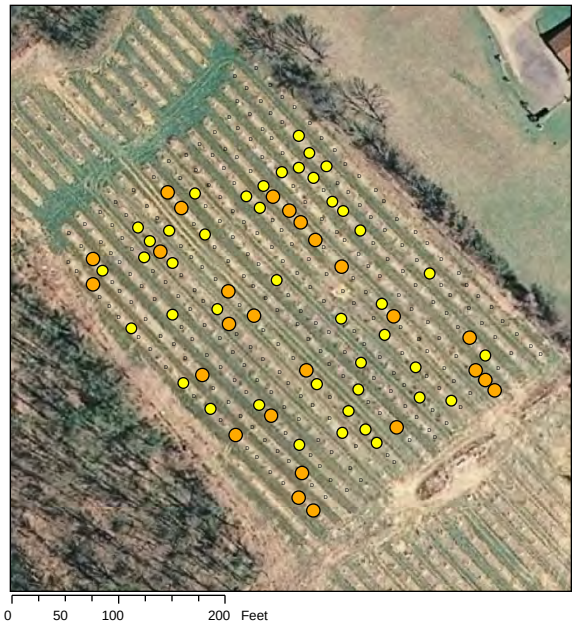


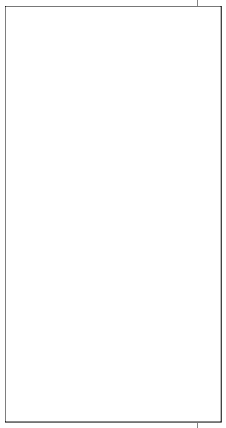
Adults



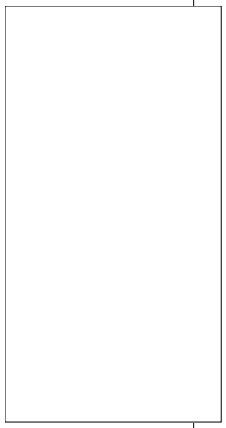
Movement within fields

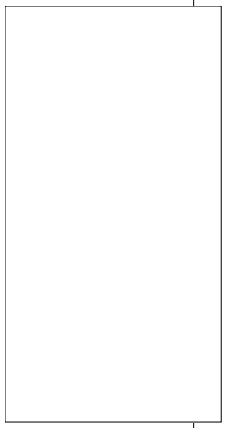
- One orchard selected in north NJ based on surrounding landscape & management tactics
- 15 rows x 22 trees GPS'd (~300 trees)
- Weekly visual and beat samples



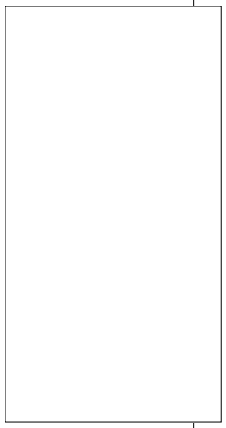


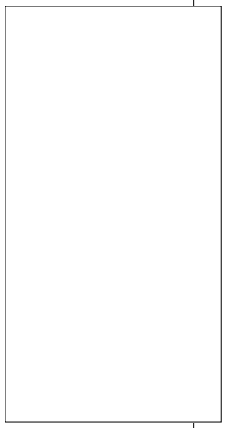
Orchard was sprayed this week

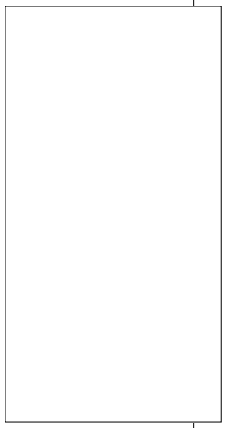




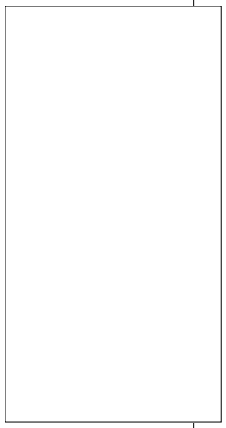
Five most northeastern rows picked



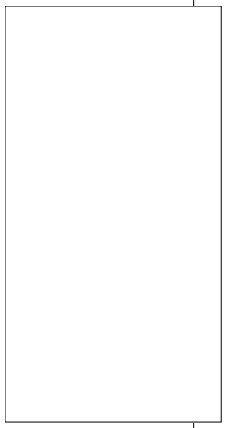




Six most northeastern rows picked



Eleven most northeastern rows picked. Some fruit hanging sparsely through field.



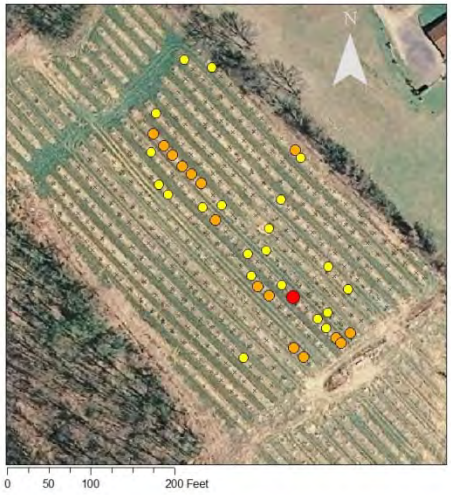
7-9-12

7-30-12

8-6-12

8-13-12

8-23-12



8-28-12

Legend

Nymphs

- 0
- 1
- 1 - 10
- >10

Landscape and temporal risk factors in peaches

- Preliminary Results
  - Unable to ID surrounding cover effects
  - Movement within fields dependant on fruit ripeness and availability
- Pitfalls Encountered
  - Low population levels
  - Growers sprays
- Follow-up Studies
  - Repeat 2012 study in 2013
  - Select orchards farther away from each other
- Expected Outcomes
  - Use landscape factors to target pest management actions

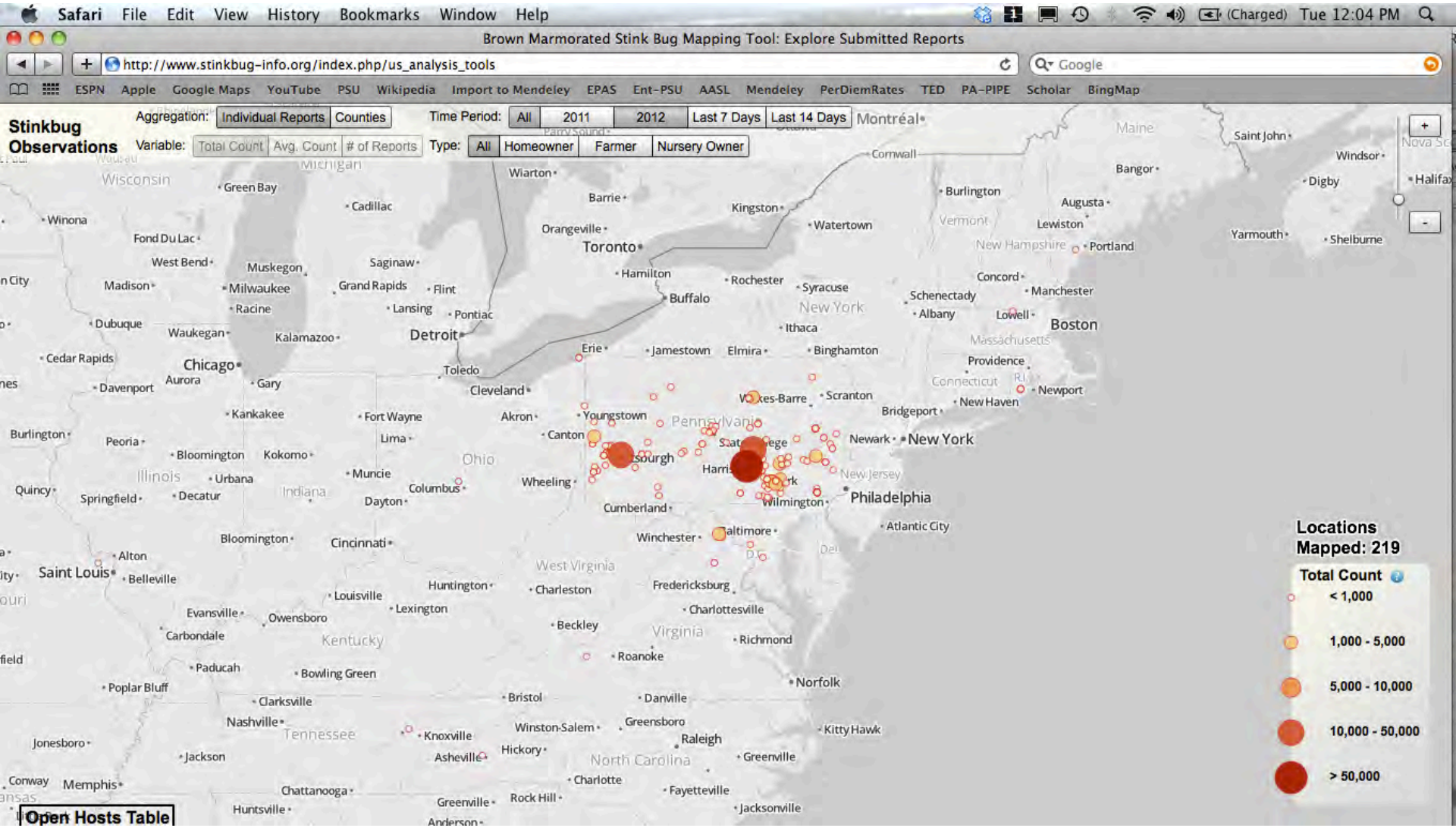
Landscape & temporal risk factors associated with BMSB reports by the general public

John Tooker, Penn State University

George Hamilton & Anne Nielsen

Rutgers University

11,514 visits since June 1st; 218 separate contributions of data; no verification



Data to limited so far for analysis; 90% of the data comes PA.

Lawn & Garden: Monitoring for the Brown Marmorated Stink Bug - Windows Internet Explorer

http://njaes.rutgers.edu/stinkbug/

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Lawn & Garden: Monitoring for the Brown Marmorate...

Page | Safety | Tools

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RUTGERS New Jersey Agricultural Experiment Station

Jersey Roots, Global Reach

NJAES Home | Cooperative Extension | Cooperative Research

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- Health Finance
- Lawn & Garden
- Mosquito Control & Vector Biology
- Natural Resources & the Environment

Links

« Back to: Lawn & Garden

Monitoring for the Brown Marmorated Stink Bug

- How to Identify the Brown Marmorated Stink Bug

Since 2000, the Brown Marmorated Stink Bug (*Halyomorpha halys* (Stål) (Hemiptera: Pentatomidae) has been confirmed in several Mid-Atlantic States and in Oregon and California. It is believed that its distribution is much wider than currently documented.

To determine the risk to agricultural and ornamental industries, we must first determine where the Brown Marmorated Stink Bug is currently located. With the help of sightings from homeowners, Rutgers University will be able to quickly develop monitoring methods and control techniques for this invasive plant pest.

If you believe you have the Brown Marmorated Stink Bug, please see the How to Identify the Brown Marmorated Stink Bug link and then fill out the secure electronic form, which will be sent to researchers currently working on monitoring this pest. If you are able to capture a specimen, please do so in any type of container. For more information please see the Rutgers New Jersey Agricultural Experiment Station (NJAES) Cooperative Extension fact sheet FS002 (PDF file).

For more information on this project, contact George Hamilton at the NJAES Pest Management Office.

Adult Male.

More Information

- About the Brown Marmorated Stink Bug
- How to Control the Brown Marmorated Stink Bug
- How to Identify the Brown Marmorated Stink Bug
- Similar Species
- Frequently Asked Questions
- Report a Sighting

Search

GO

- NJAES Websites
- All of Rutgers
- eXtension FAQ

County Offices

Need more information about Monitoring for the Brown Marmorated Stink Bug? Contact your Cooperative Extension county office for answers to your questions.

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www.njaes.rutgers.edu/stinkbug

BMSB By Virtual Mosquito

Open iTunes to buy and download apps.

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BMSB

View in iTunes

Free

Category: Education
Released: Sep 15, 2011
Version: 01
Size: 10.8 MB
Seller: Kristen Bartlett
© 2011
Rated 4+

Requirements: Compatible with iPhone, iPod touch, and iPad. Requires iOS 3.0 or later

Customer Ratings

We have not received enough ratings to display an average for the current version of this application.

More iPhone Apps by Virtual Mosquito

Description

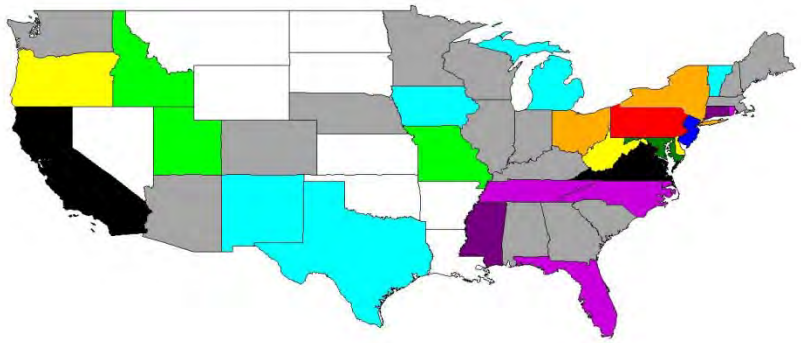
This application provides educational information regarding the brown marmorated stink bug. The app includes weekly photos, and tips for homeowners and farmers on how to manage these stink bugs.

BMSB Support

iPhone Screenshots

Results to Date

- Started in 2004
- 10,569 reports
- Reports from 41 states
- Reports from Canada and France
- 2,134 confirmed reports

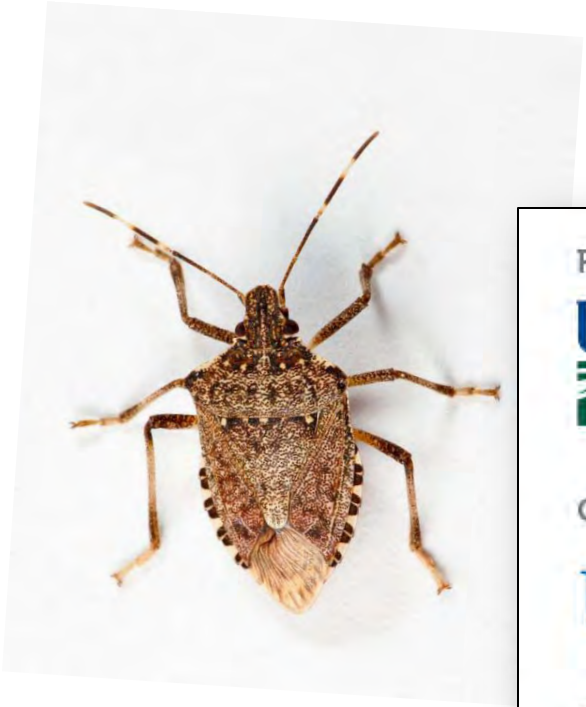


Challenges and Next Steps

- Challenges
  - Obtaining enough data
  - Reports vs. confirmations
- Next Steps
  - Connecting the two datasets
  - Landscape analysis
  - Possible connection to bugwatch.com

http://www.veggiegardeningtips.com/march-of-the-brown-marmorated-stink-bug/

QUESTIONS?



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