Southern Region BMSB Update

2016 funding from SIMPC to develop a Southern BMSB working group; AL, GA, FL, SC, NC, TN

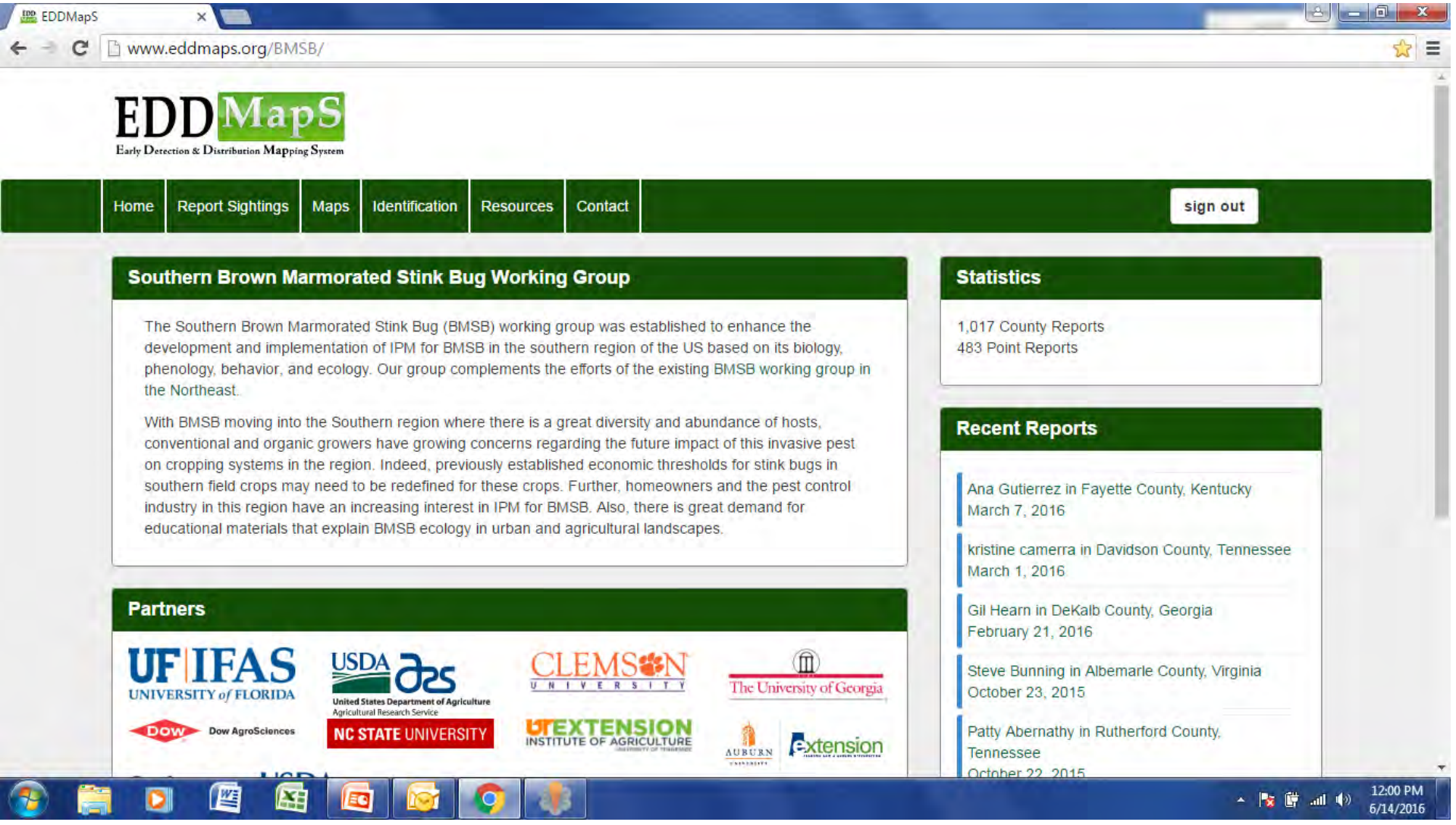
Main goals

• Hold a southern region stakeholder meeting and develop a priority list for upcoming research; April

• Establish formal communications among working group members; Basecamp

• Update known hosts and distribution maps for the southern US; in progress

Monitoring: current distribution & expansion
Overwintering: if and where
Reproducing populations
Establishment
Host plants
Crops/Damage


EDDMapS
www.eddmaps.org/BMSB/
EDDMapS
Early Detection & Distribution Mapping System
Home
Report Sightings
Maps
Identification
Resources
Contact
sign out
Southern Brown Marmorated Stink Bug Working Group
The Southern Brown Marmorated Stink Bug (BMSB) working group was established to enhance the development and implementation of IPM for BMSB in the southern region of the US based on its biology, phenology, behavior, and ecology. Our group complements the efforts of the existing BMSB working group in the Northeast.
With BMSB moving into the Southern region where there is a great diversity and abundance of hosts, conventional and organic growers have growing concerns regarding the future impact of this invasive pest on cropping systems in the region. Indeed, previously established economic thresholds for stink bugs in southern field crops may need to be redefined for these crops. Further, homeowners and the pest control industry in this region have an increasing interest in IPM for BMSB. Also, there is great demand for educational materials that explain BMSB ecology in urban and agricultural landscapes.
Partners
UF IFAS UNIVERSITY of FLORIDA
USDA ARS United States Department of Agriculture Agricultural Research Service
CLEMSON UNIVERSITY
The University of Georgia
DOW Dow AgroSciences
NC STATE UNIVERSITY
UTEXTENSION INSTITUTE OF AGRICULTURE
AUBURN
Extension
Statistics
1,017 County Reports
483 Point Reports
Recent Reports
Ana Gutierrez in Fayette County, Kentucky
March 7, 2016
kristine camerra in Davidson County, Tennessee
March 1, 2016
Gil Hearn in DeKalb County, Georgia
February 21, 2016
Steve Bunning in Albemarle County, Virginia
October 23, 2015
Patty Abernathy in Rutherford County, Tennessee
October 22, 2015
12:00 PM
6/14/2016

With BMSB moving into the Southern region where there is a great diversity and abundance of hosts, conventional and organic growers have growing concerns regarding the future impact of this invasive pest on cropping systems in the region. Indeed, previously established economic thresholds for stink bugs in southern field crops may need to be redefined for these crops. Further, homeowners and the pest control industry in this region have an increasing interest in IPM for BMSB. Also, there is great demand for educational materials that explain BMSB ecology in urban and agricultural landscapes.

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More Reports

Educational Resources

- Stop BMSB
- Southern Region Brown Marmorated Sting Bug Working Group Flyer
- Southern Region Brown Marmorated Sting Bug Working Group
- Brown Marmorated Sting Bug in Georgia

Identification

Description

The Brown Marmorated Stink Bug (BMSB) adult is similar in appearance to several native stink bug species, but can be distinguished by several characteristics. Firstly, it has light-colored bands on the joints of the antenna and legs. Also, on its ventral side, its abdominal venter is white to ash grey and may include a black spot at the terminus of the abdomen. The thin beak extends between the hind legs and is always dark colored. On the dorsal side, adults have a brown or grey marbled appearance with blue-green metallic coloration in the depressions on the head, pronotum, and connexivum, which is mostly visible in sunlight. They also have light and dark colored spots around the lateral margins of the abdomen that are not covered by the wings when the insects are at rest. The leading edge of the shoulder is smooth and not pointed on the ends. Adults are approximately 2/3" long, and females are typically larger than males.

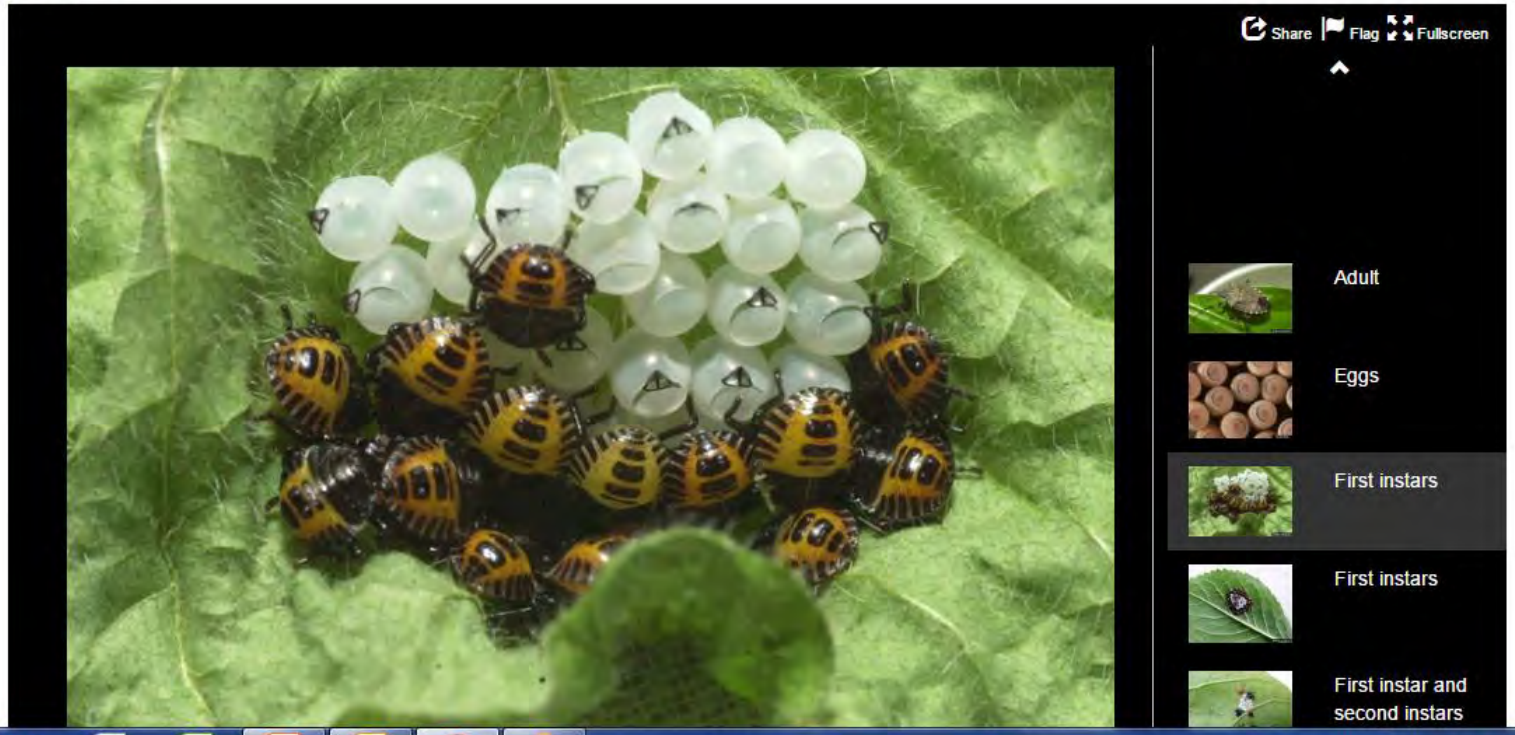
Brown/grey marbling on dorsal side; light and dark colored spots along margin of abdomen not covered by wings

EDDMapS

www.eddmaps.org/bmsb/resources.cfm

Home | Report Sightings | Maps | Identification | **Resources** | Contact | sign out

Images



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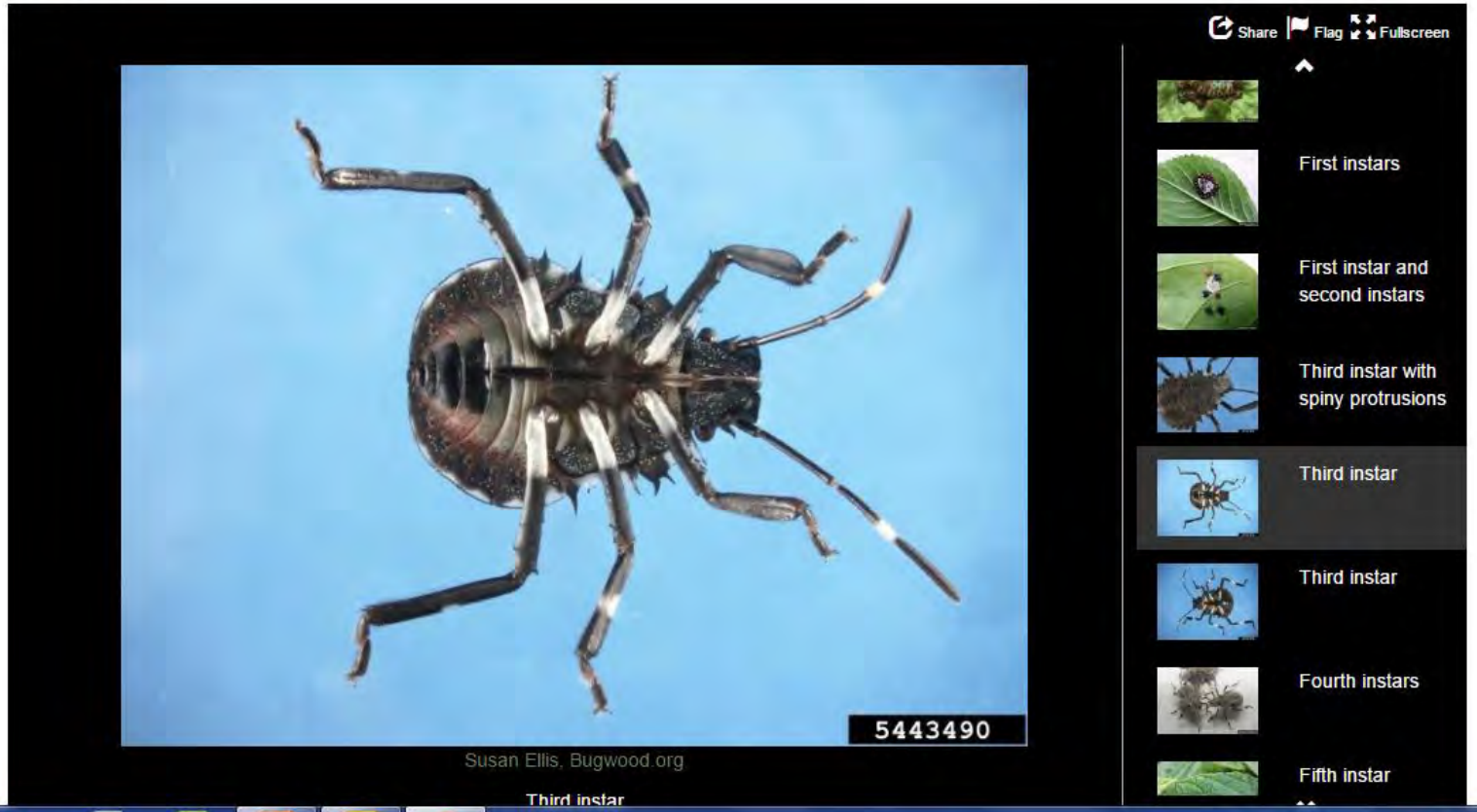
EDDMapS

www.eddmaps.org/bmsb/resources.cfm

Images



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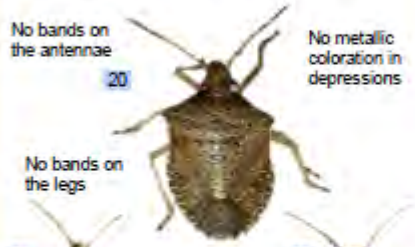
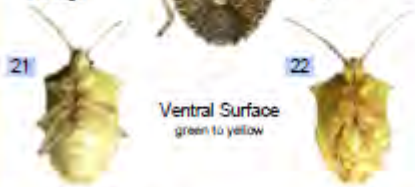
Brown Stink Bug

Euschistus servus





Female Male

Eggs 1st instars 2nd instar

3rd instar 4th instar 5th instar

Other Closely Resembling Species:

Brochymena quadripustulata *Euschistus tristigmus*

Brown Marmorated Stink Bug

Halyomorpha halys

The brown marmorated stink bug is a native of China, Taiwan, Korea and Japan. This invasive insect pest has spread to the United States, Canada, and Europe.

It is a serious economic pest of orchard crops, including apple and peach, row crops such as corn and soybeans, and vegetable crops including sweet corn, pepper, eggplant, and tomato.

Photo Credits

Gary Bernon, USDA, APHIS, Bugwood.org (14)

Susan Ellis, Bugwood.org (12,15,17-19)

Kristie Graham, USDA, ARS (1-11, 29)

Davis R. Lance, USDA, APHIS, PPQ, Bugwood.org (13)

Herb Pilcher, USDA, ARS (20-28,30)

Martin E. Rice, Pioneer Hi-Bred (16)

Information

http://www.sipmc.org/BMSB

To report a BMSB sighting:

http://www.EDDMapS.org/BMSB/Report

Funding provided by USDA NIFA, under Agreement No. 2014-70006-22485 via Southern IPM Center Working Group Program (Project 998458)

Southern Region Brown Marmorated Stink Bug Working Group

THE UNIVERSITY OF GEORGIA COOPERATIVE EXTENSION

USDA United States Department of Agriculture

Agricultural Research Service

ID flyer for extension agents, pest control operators, growers, researchers

Brown Marmorated Stink Bug

Halyomorpha halys

The BMSB adult is similar in appearance to several native species. A few identifying differences between the BMSB and the brown stink bug (native) are shown below.

1

Two light colored bands on the joints of the antenna

2

Light abdominal venter with grey shading along edges

3

4

Blue-green metallic coloration in the depressions on head, pronotum, and connexivum mostly visible in sunlight

5

Smooth anterolateral pronotal margin

6

7

White bands on the legs

Adults

Adults are approximately 2/3" long. In most cases the female is larger than the male.

8

9

Female

10

Male

Eggs

11

Fresh

12

Close to hatching

Eggs with Nymphs

13

Hatched egg mass with 1st instars

14

Hatched egg mass with 1st instars molting into 2nd instars

Nymphs

Nymphs have five instars (immature stages) that range from 1/16" to 1/2" in length. They move quickly – faster than the native species.

15

3rd instar

16

4th instar

17

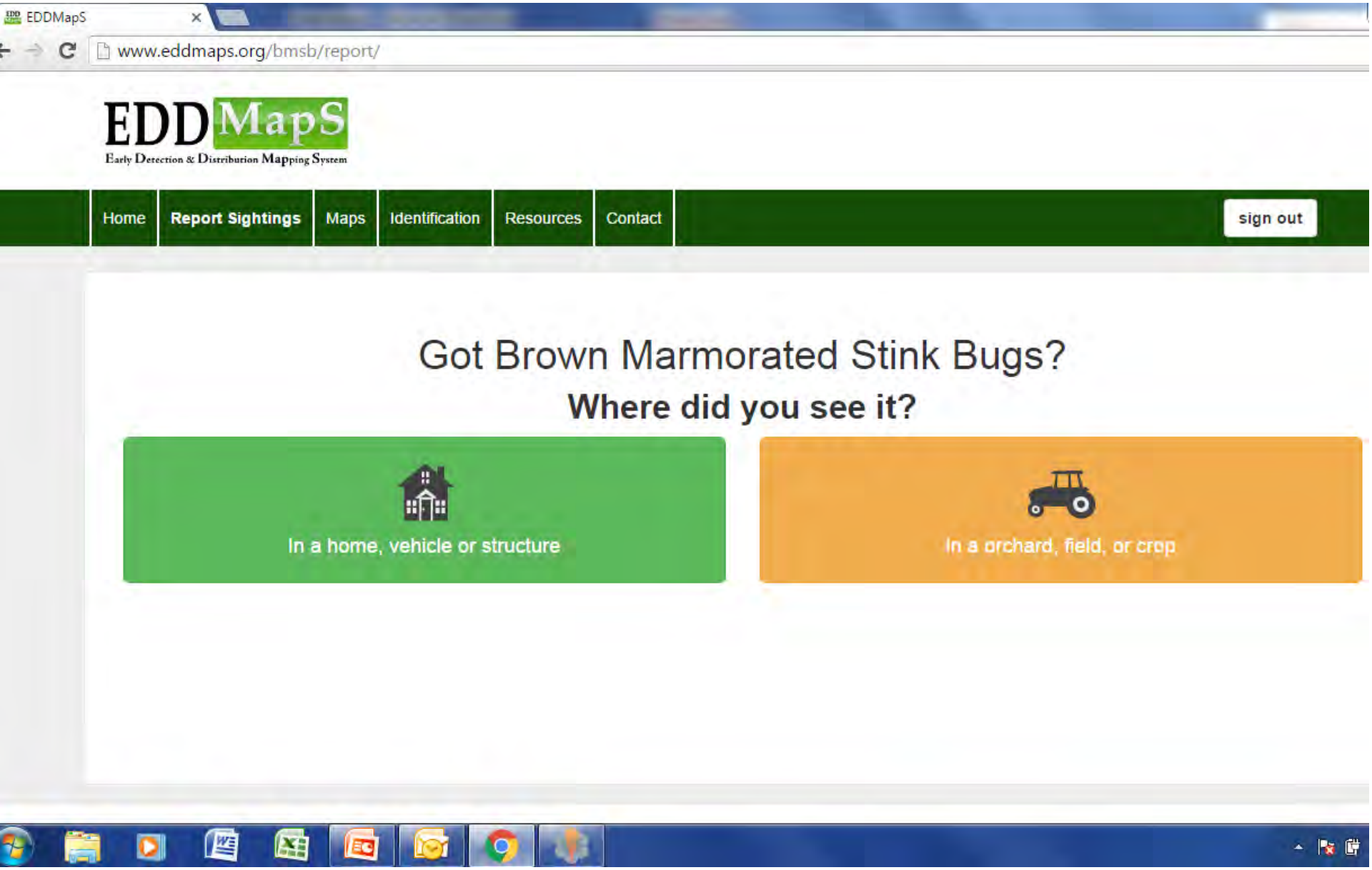
Older instars begin showing white bands on their legs

5th instar wings developing

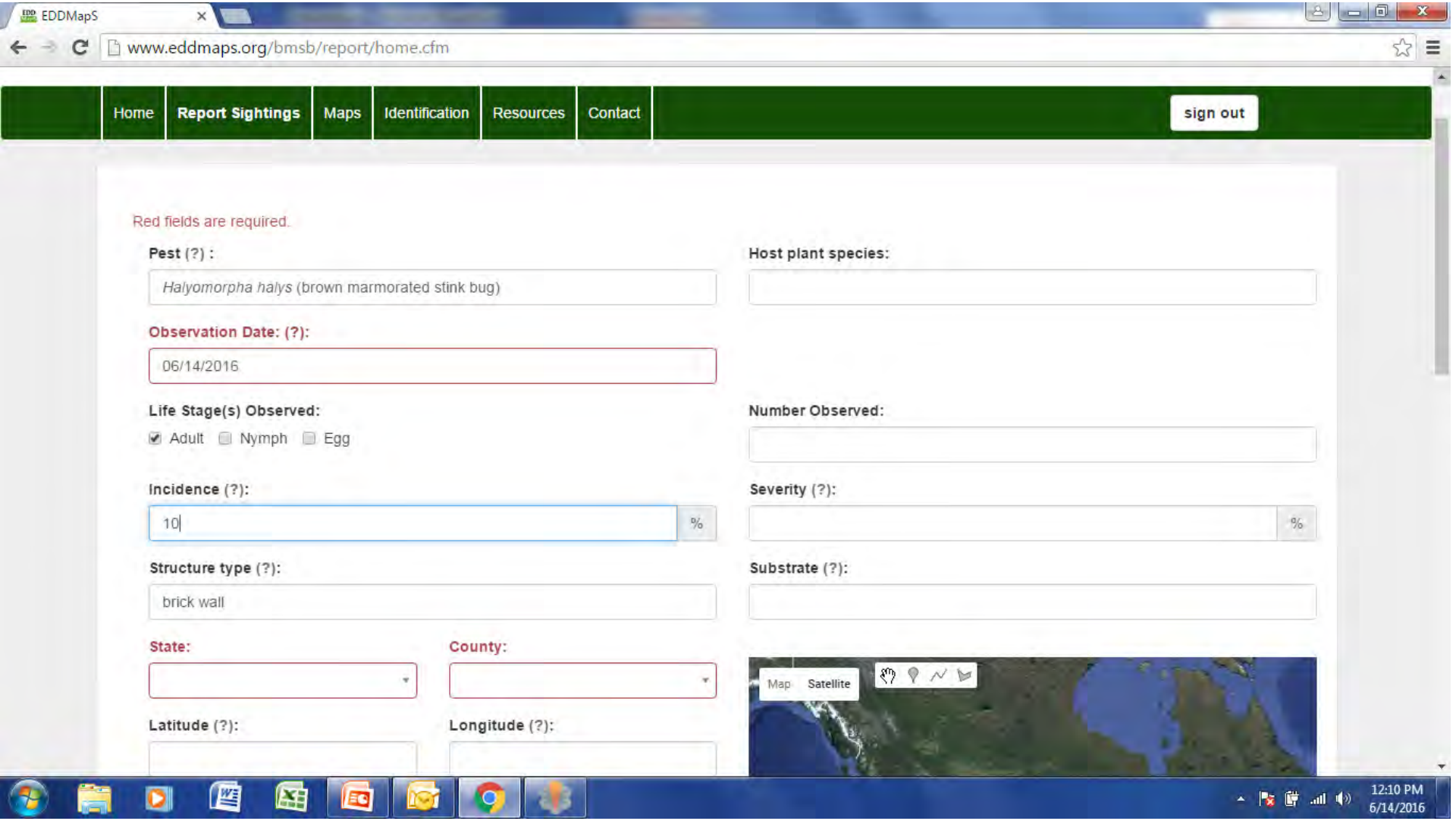
18

19

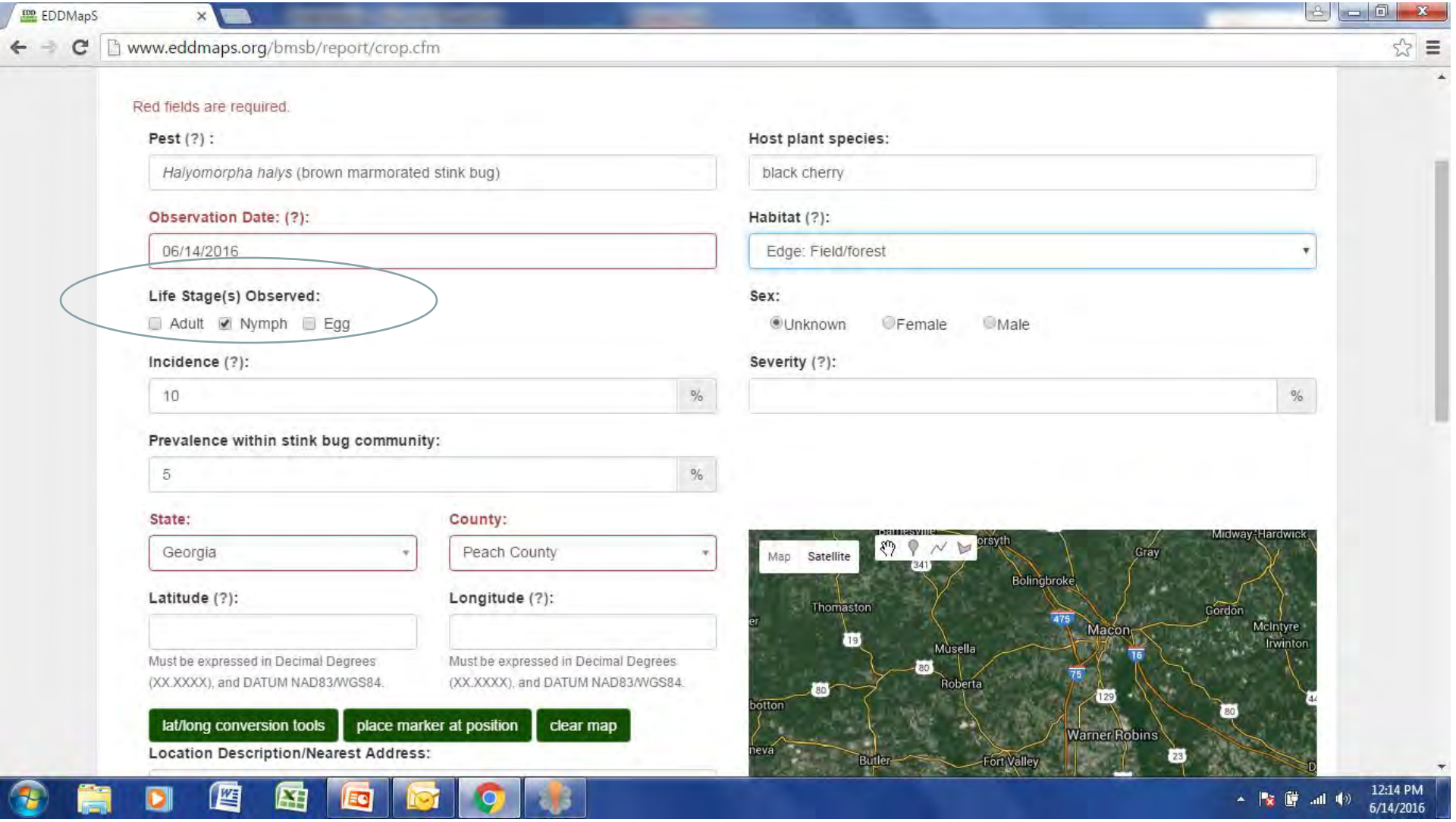
Younger instars have serrated (spikes) edges along the pronotum



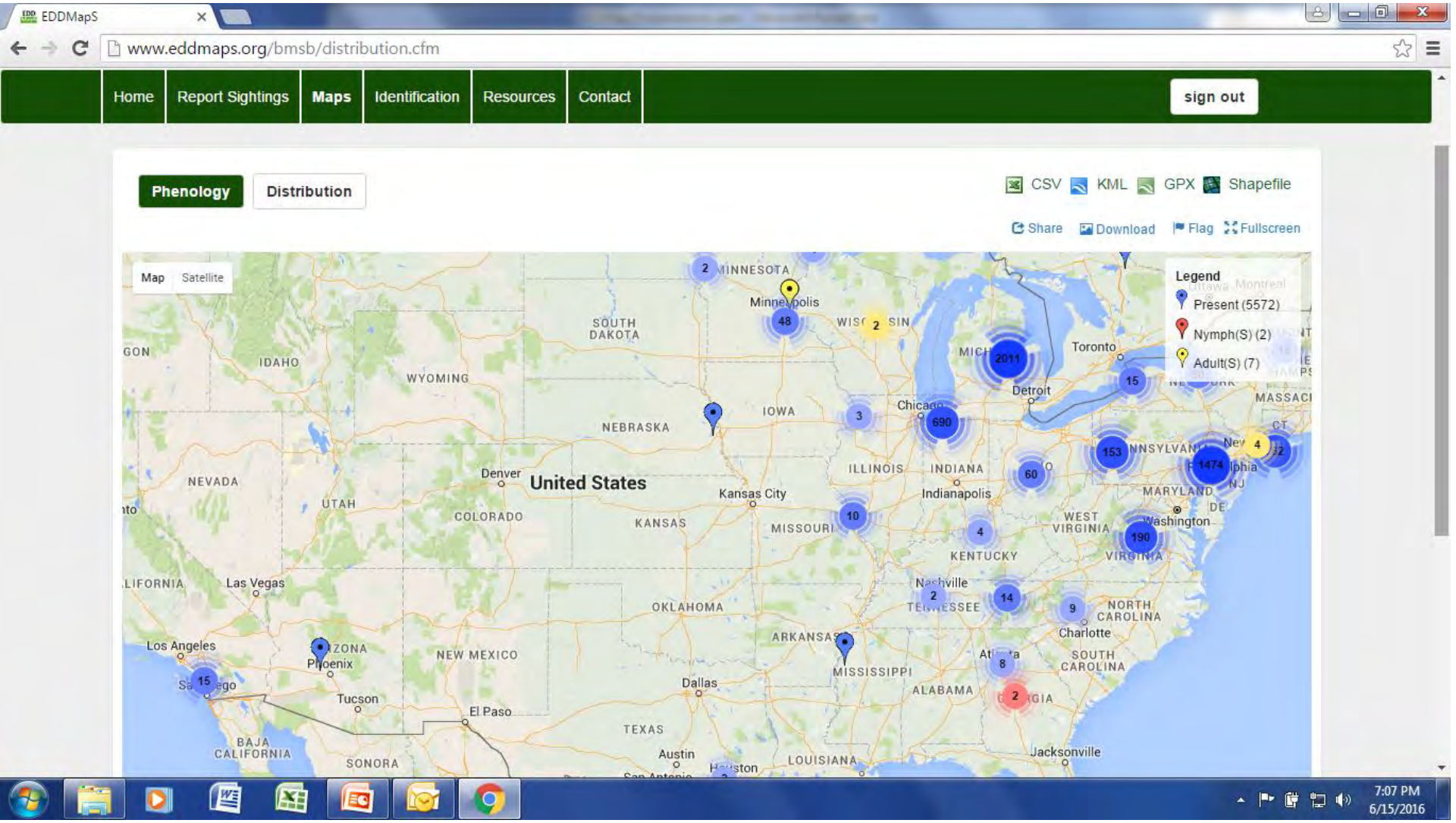
Can choose type of report



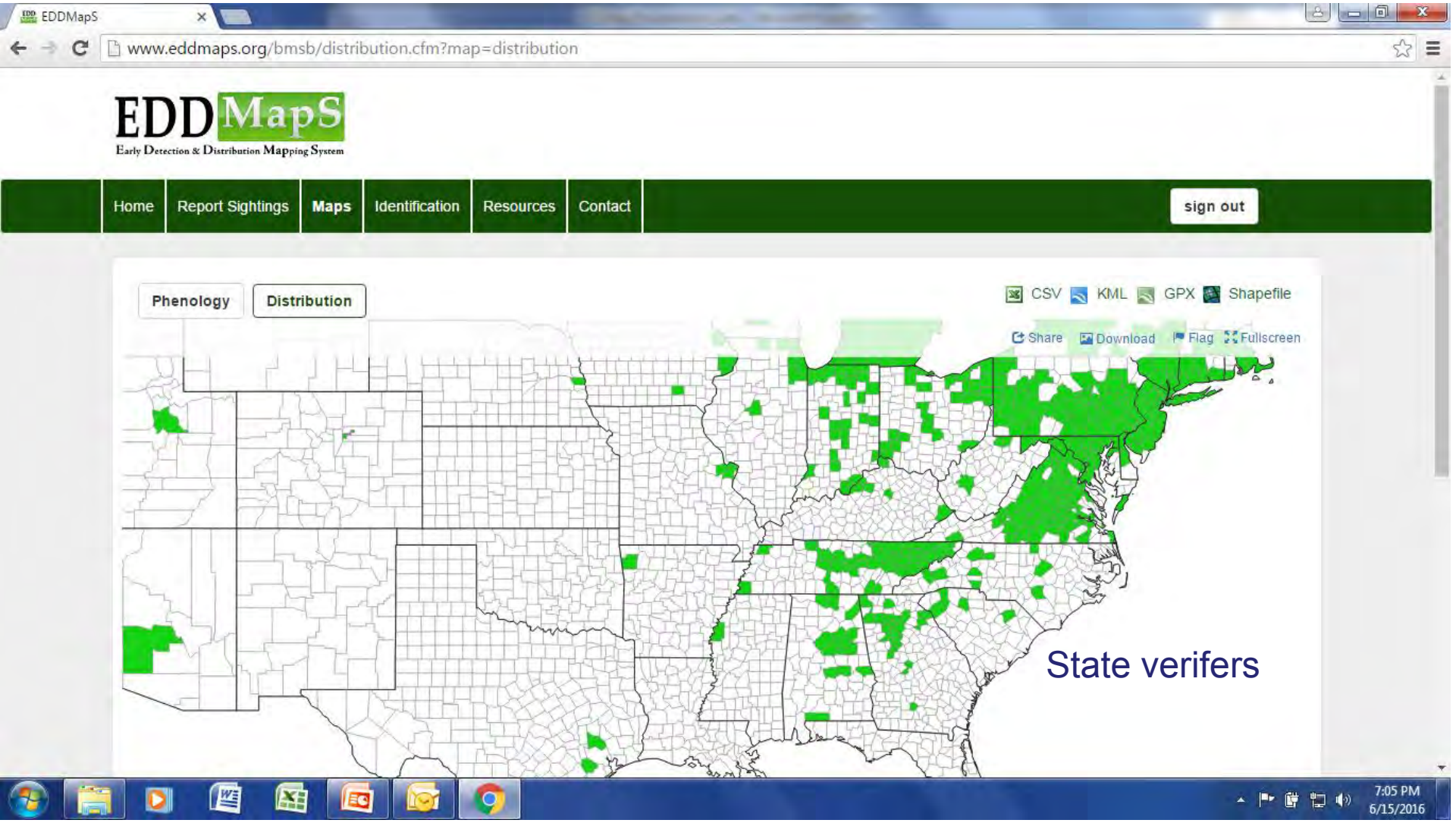
Nik Wiman working with Joe LaForest to develop a more detailed report.



Reproductive populations?



Can toggle between phenology and distribution map

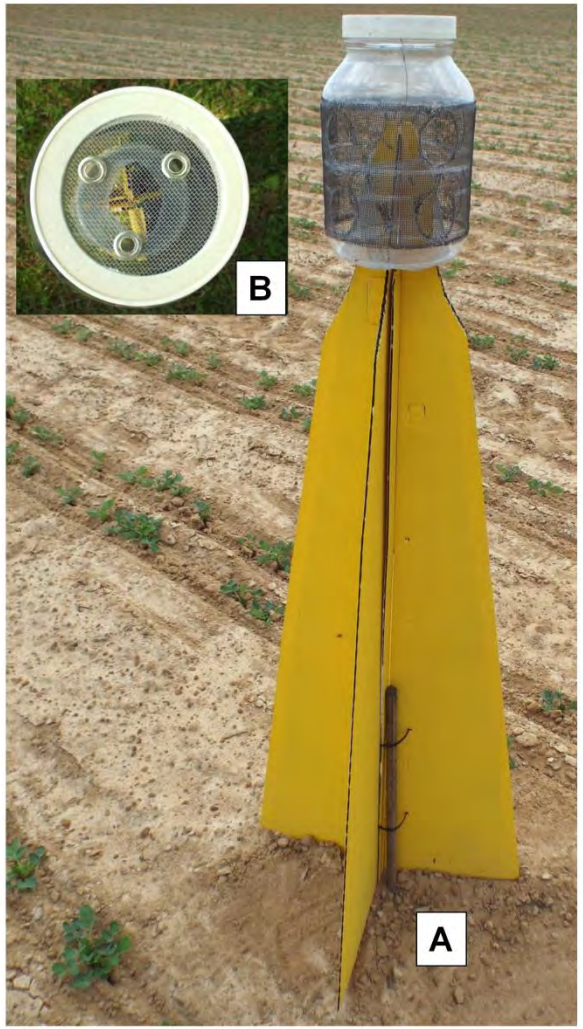


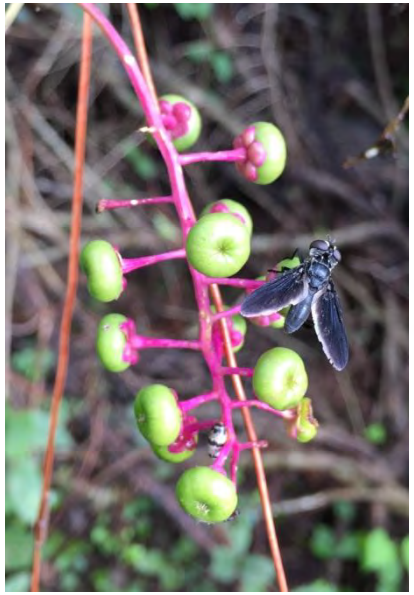
StopBMSB can this if want. Contact Joe LaForest with UGA in Tifton, GA.

Using Pheromone-baited Pyramid Traps to Monitor BMSB

For traps in the southern region, an insect-collecting device made from an aerated clear plastic jar with several air vents is seated atop a black corrugated plastic pyramid base (Great Lakes IPM, Inc.). The insertion of three eyelets in the lid of the insect-collecting device allows adult stink bug parasitoids, but not stink bug adults, to escape.

AgBio, Inc. combo lure: BMSB aggregation pheromone + *P. stali* aggregation pheromone





Trichopoda spp. adult

BMSB In Florida: Detected, but not established

- No evidence of a sustained, reproducing population in Florida.
- 36 detections consisting of 69 specimens.
- Additional detections usually associated with travelers returning from states with BMSB – mostly at Florida's agricultural interdiction stations or on RVs.

Figures adapted from www.stopbmsb.org

Susan Halbert, FDACS-DPI

BMSB in Florida Peach

- 28 yellow pyramid traps baited with BMSB pheromone lure deployed at 5 locations
- 2 Adult BMSB recovered from orchard in Lake County (note: there was a traveler from northern states that could account for these captures)
- No additional finds at positive location in 60 day period following detection
- No nymphs or signs of reproduction
- At this time do not anticipate that BMSB will be a problem in Florida peach

Photos: Cory Penca

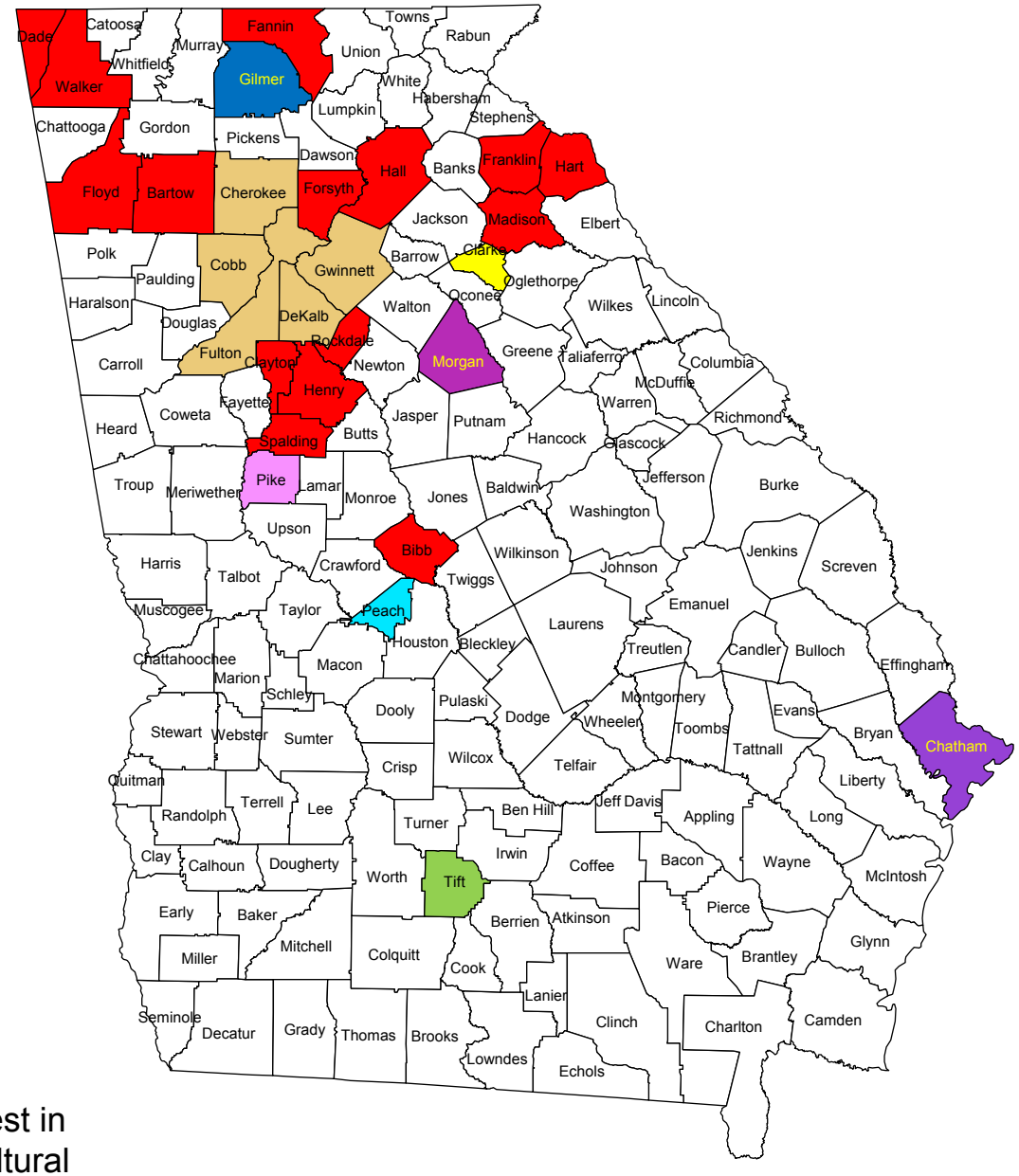
Amanda Hodges, Cory Penca, Univ. Florida

Georgia BMSB Team

Joe LaForest
Ted Cottrell
Glynn Tillman
Michael Toews
David Buntin
Rick Hoebeke
Dan Suiter
Lisa Ames
Phillip Roberts
Elizabeth Moss
Ash Sial
Whitney Hadden

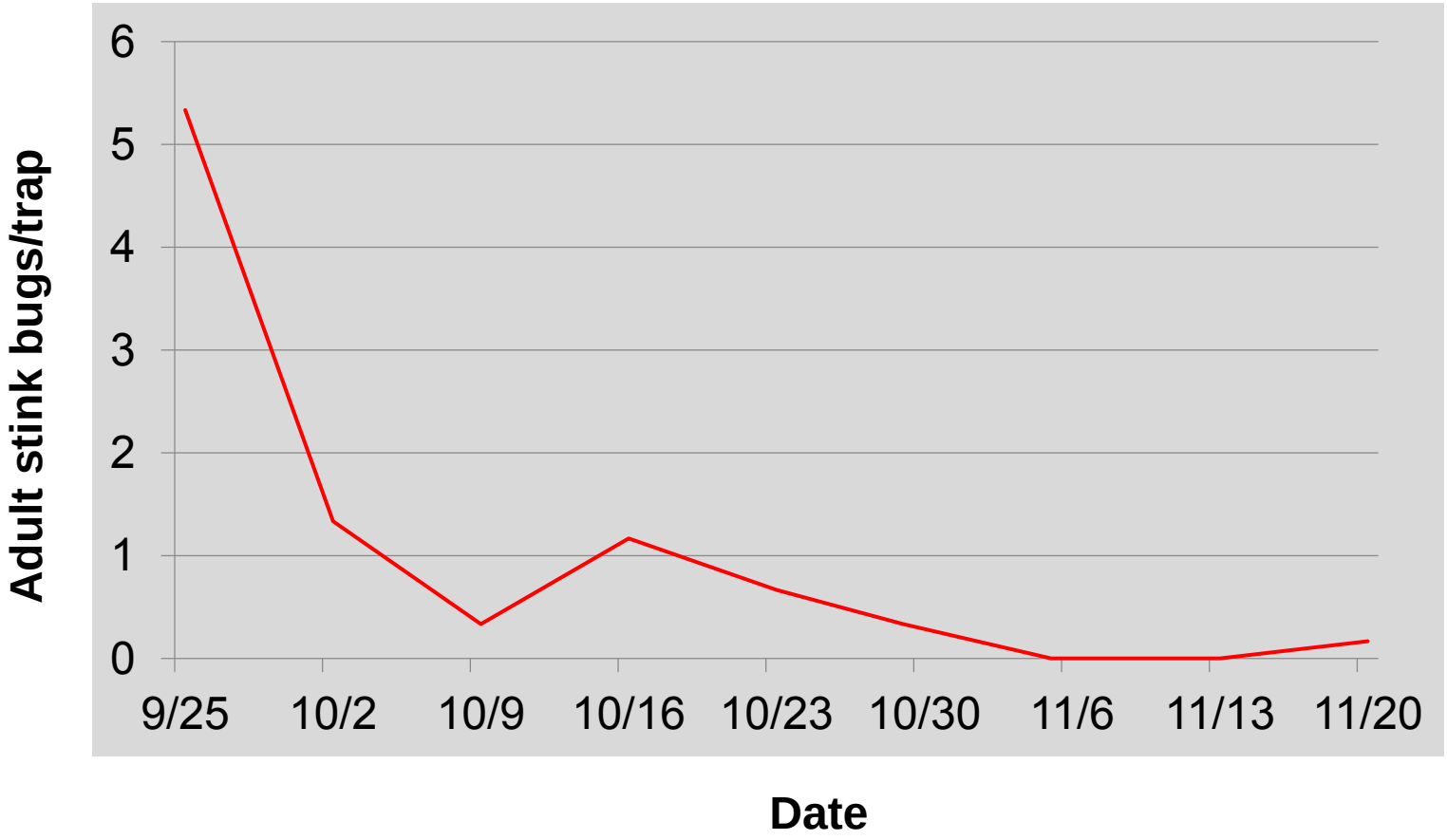
Known Distribution of BMSB in Georgia

- 2011-2016: Urban pest management professionals reporting overwintering aggregations in the Atlanta Metro area; established populations; recently egg mass found on apple in Cherokee county
- 2014: reproducing BMSB populations in cotton, pecan, catulpa, and ornamental hibiscus
- 2014: adults in cotton
- Jan. 2015: authorities at the Port of Savannah disclosed detection of BMSB in international cargo shipped out of Ga.
- 2015: BMSB on apples in Gilmer County in the Blue Ridge Mountain region
- 2015: reproducing BMSB populations in soybean in Pike County in the Piedmont region
- 2015: reproducing BMSB populations in peach in Peach County in the Coastal Plain region
- Adults detected
- I-75 Hitchhiker



Status: limited establishment, major nuisance pest in homes, reproductive populations in some agricultural crops

BMSB invades the coastal plain in 2015

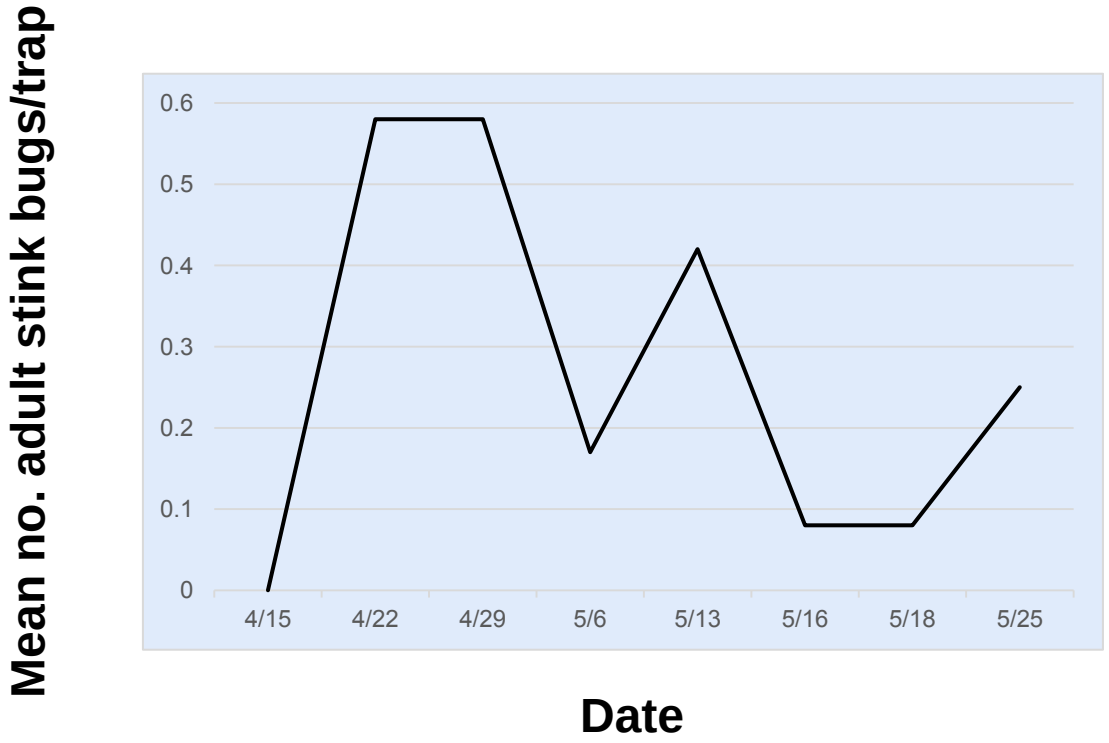


Byron, GA - late instars found on peach Aug. 2015.

- trapping during fall 2015 revealed adults at the SEFTNRL.

Ted Cottrell, USDA, ARS

BMSB adults detected in Byron, GA in Spring 2016



Traps are near peach/pecan/woods. BMSB overwintered successfully at Byron – adults captured in fall of 2015, detected in homes during the winter, captured adults in spring of 2016. Established in this area – nymphs found late season in 2015 and overwintering adults captured the following spring.

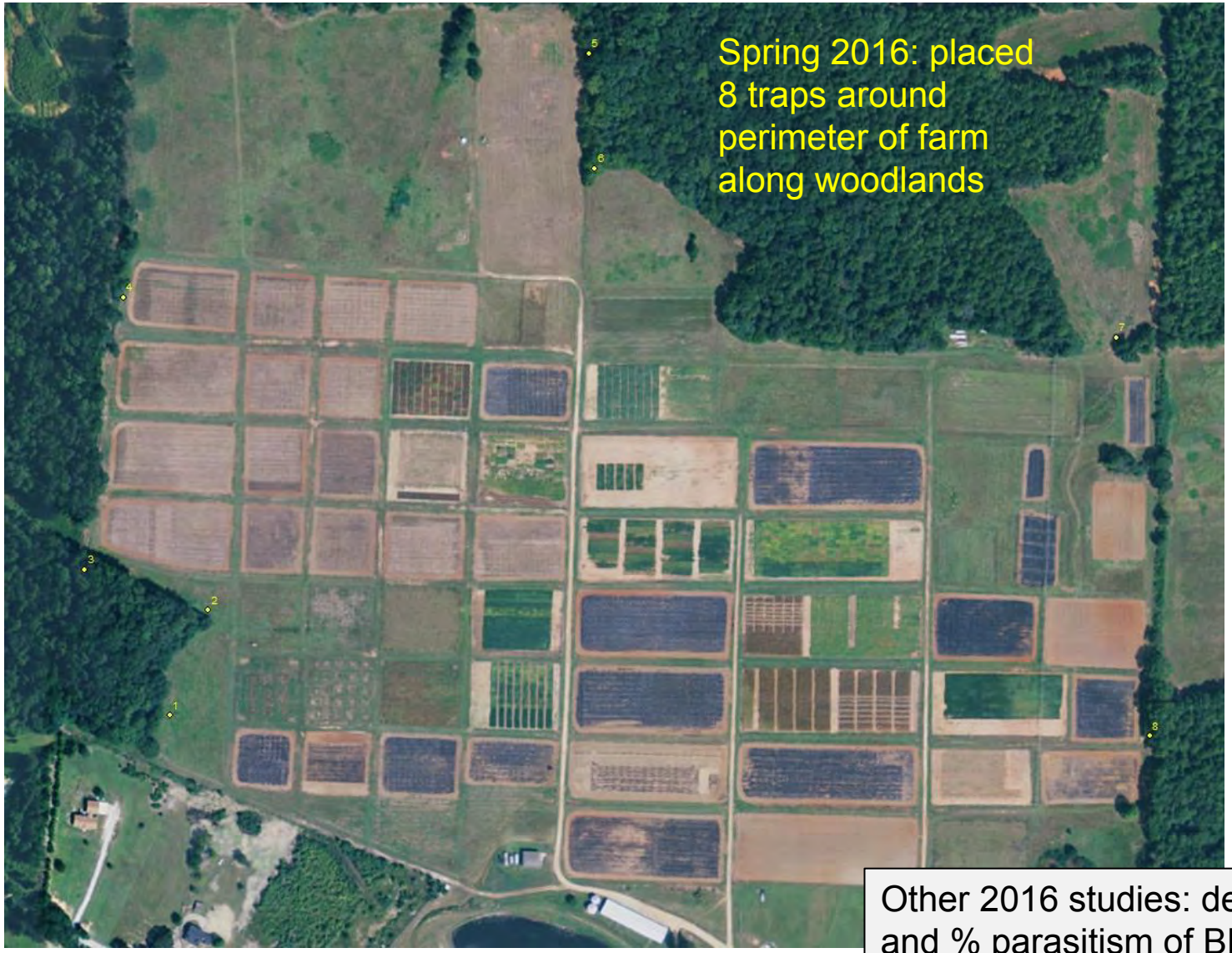
Ted Cottrell, USDA, ARS

First Detection of BMSB in Peach Away from Byron, GA

This past Friday (June 10), 2 BMSB adults were captured in traps near a commercial peach orchard about 12 miles southwest of Byron. All things considered, their numbers are low compared with the brown stink bug. This is not far from Fort Valley where Hwy 49 and 341 are major thoroughfares. So it's not farfetched that BMSB was brought in from other areas via vehicles.

Ted Cottrell, USDA, ARS

BMSB at UGA Bledsoe Row Crop Farm near Griffin, GA



- nymphs and adults in soybean 2015
- some OW adults observed in March in Griffin, GA
- OW adults captured in spring of 2016
- established in the county

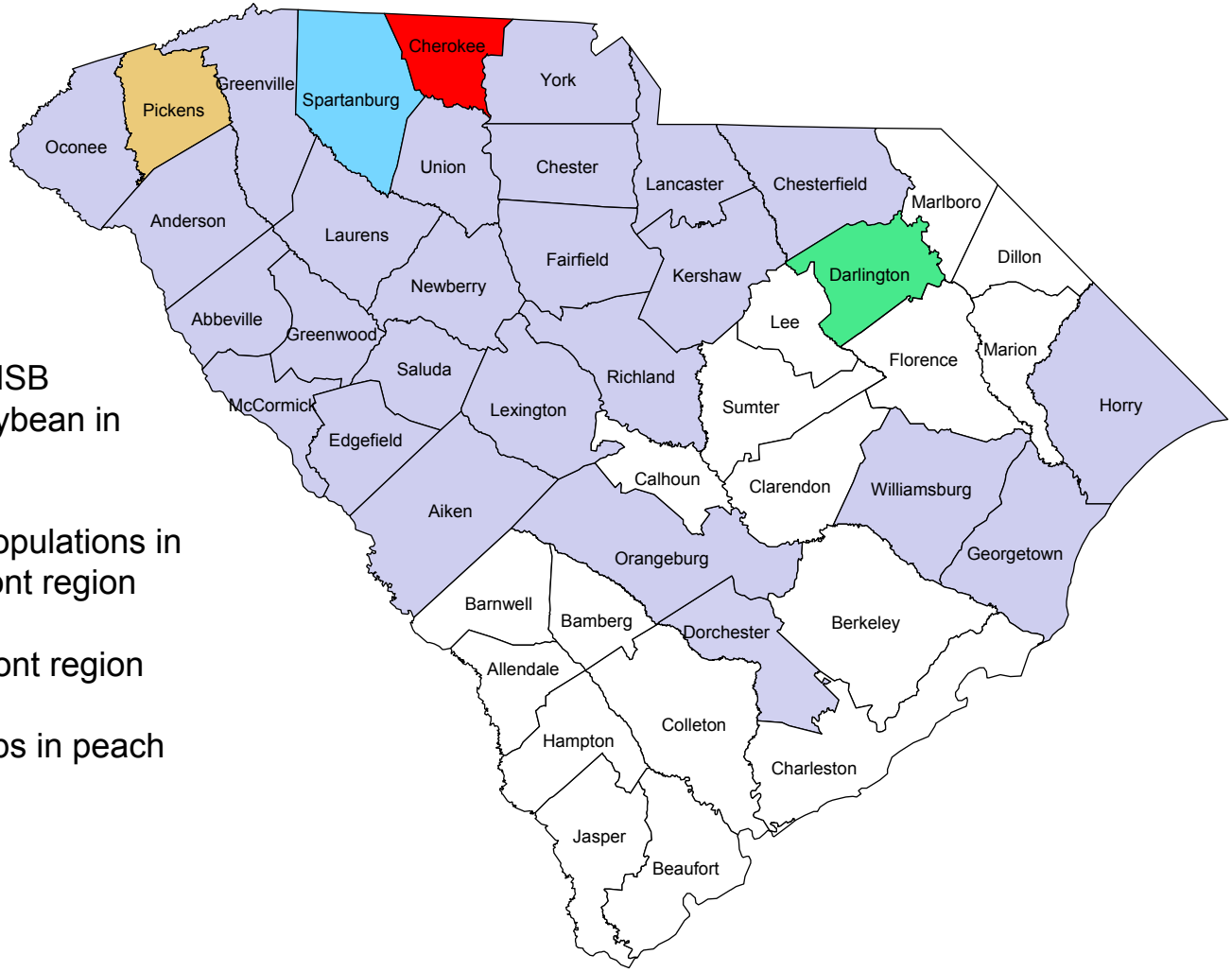
2016 trap captures:

5/16 - 5 adults
5/23 - 3 adults
5/30 - 3 adults
6/6 - 3 adults

Other 2016 studies: determine density and % parasitism of BMSB in soybean and field corn (unknown host crop in GA); monitoring NE including *T. japonicus*

Glynn Tillman, USDA/ARS and
David Buntin and Mike Toews, UGA

Distribution of BMSB in SC



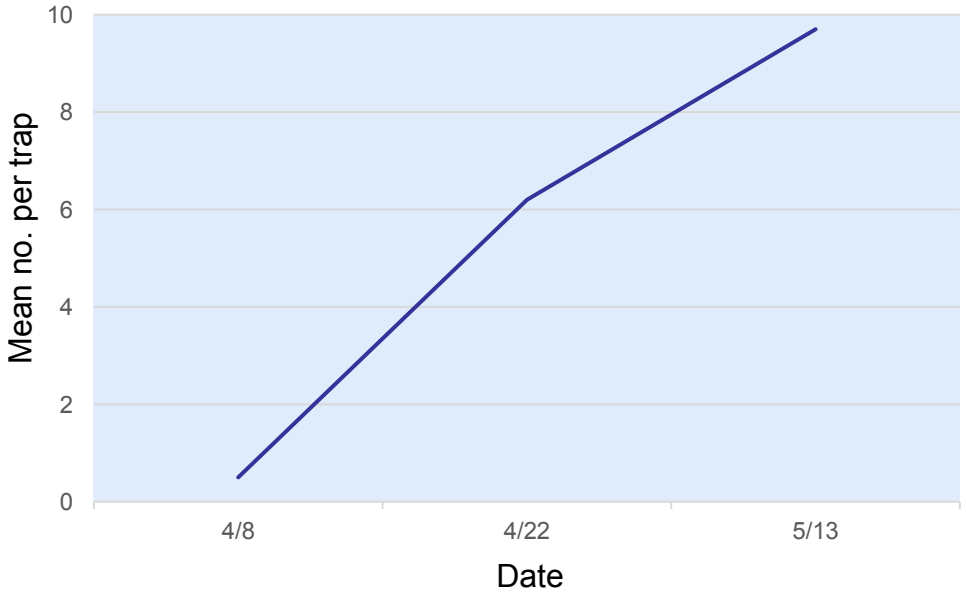
- 2014-2015: Reproducing BMSB populations in cotton and soybean in Coastal Plain region
- 2015: Reproducing BMSB populations in grain sorghum in the Piedmont region
- 2015: In cotton in the Piedmont region
- 2016: Captured in baited traps in peach orchards in Piedmont region

Nuisance pest in homes

Jeremy Greene, Francis Reay-Jones, Eric Benson, and Stephen Cole – Clemson University

BMSB in South Carolina Peach - 2016

- Pyramid traps baited with AgBio combo lure deployed at 6 sites in Spartanburg, SC
- Captured overwintering adults in spring of 2016
- Higher trap capture in peach in upstate SC than in peach in Coastal Plain in GA

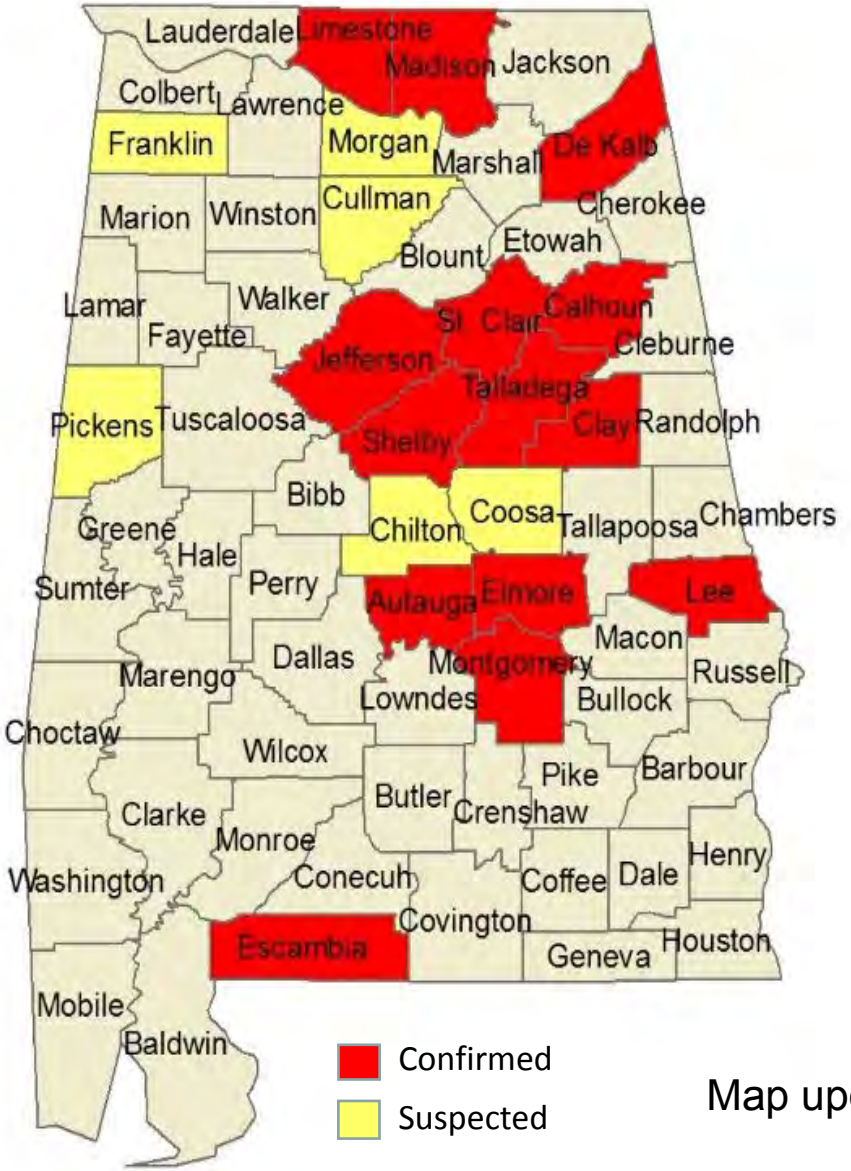


Andy Rollins (Clemson University) and Ted Cottrell (USDA-ARS)

Alabama BMSB Team

Rammohan Balusu
Savannah Duke
Henry Fadamiro
Kathy Flanders
Alana Jacobson
David Held
Xing Ping Hu
Ayanava Majumdar
Charles Ray
Tim Reed
Ron Smith

Current Distribution Map



- Nymphal populations on soybean in various locations in north Alabama and Autauga county
- Damaging populations on soybean in Madison county and cotton in Autauga county
- Increase in stink bug damage on corn ears in north AL
- Serious nuisance pest in homes (more reports each year)

Map update: Charles Ray, Auburn University

Projects Starting in 2016

Fadamiro and Balusu Lab

- Evaluate the effect of trap color (yellow vs black) on capture of BMSB in vegetable and fruit crops (collaborative study with Ted Cottrell); 3 locations in AL- Fairhope, Clanton, and Auburn University (no BMSB captured yet); 1 location in GA - Byron

- Identify plant-based semiochemical attractants for BMSB

Projects Starting in 2016

Smith, Reed, Duke, and Flanders

- Validating Treatment Thresholds and Determining Border Effect of Brown Marmorated Stink Bugs in Cotton

Ongoing Projects

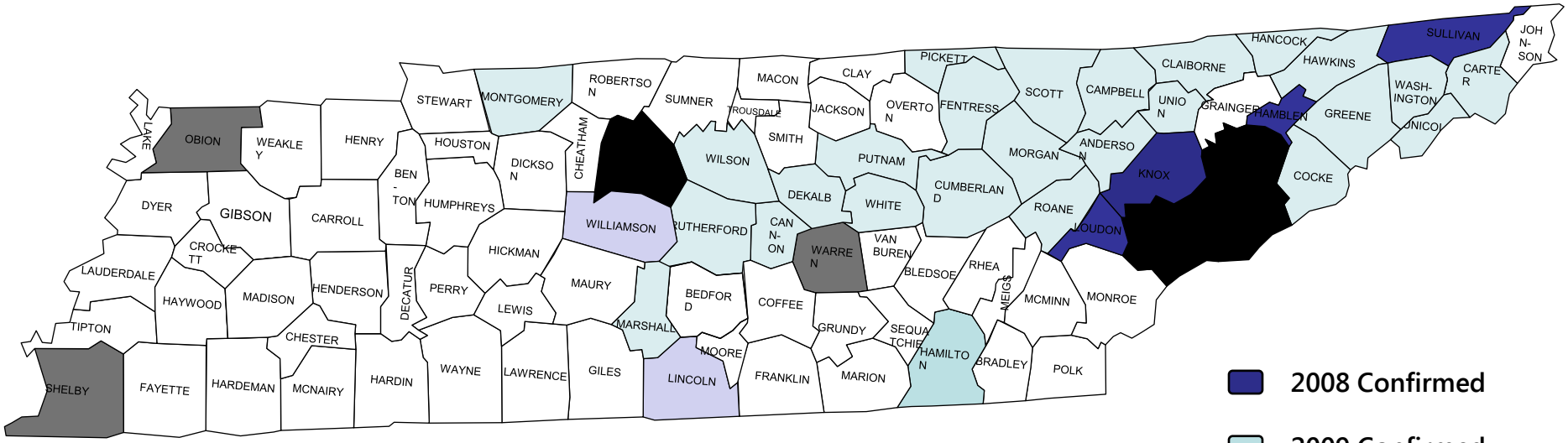
Duke and Flanders

- Determine distribution of BMSB in AL
- Survey corn in North AL for ear damage

Tennessee BMSB Team

Scott Stewart
Frank Hale
Karen Vail
Jerome Grant

Brown Marmorated Stink Bug Distribution
2008-2015



Confirmed by UT Extension Agents (no specimen): Montgomery, Wilson, Marshall, Putnam, Roane, Hancock, Claiborne, Greene, Unicoi, Carter, Warren

*Knox Country New State Record

Pest Status in Tennessee

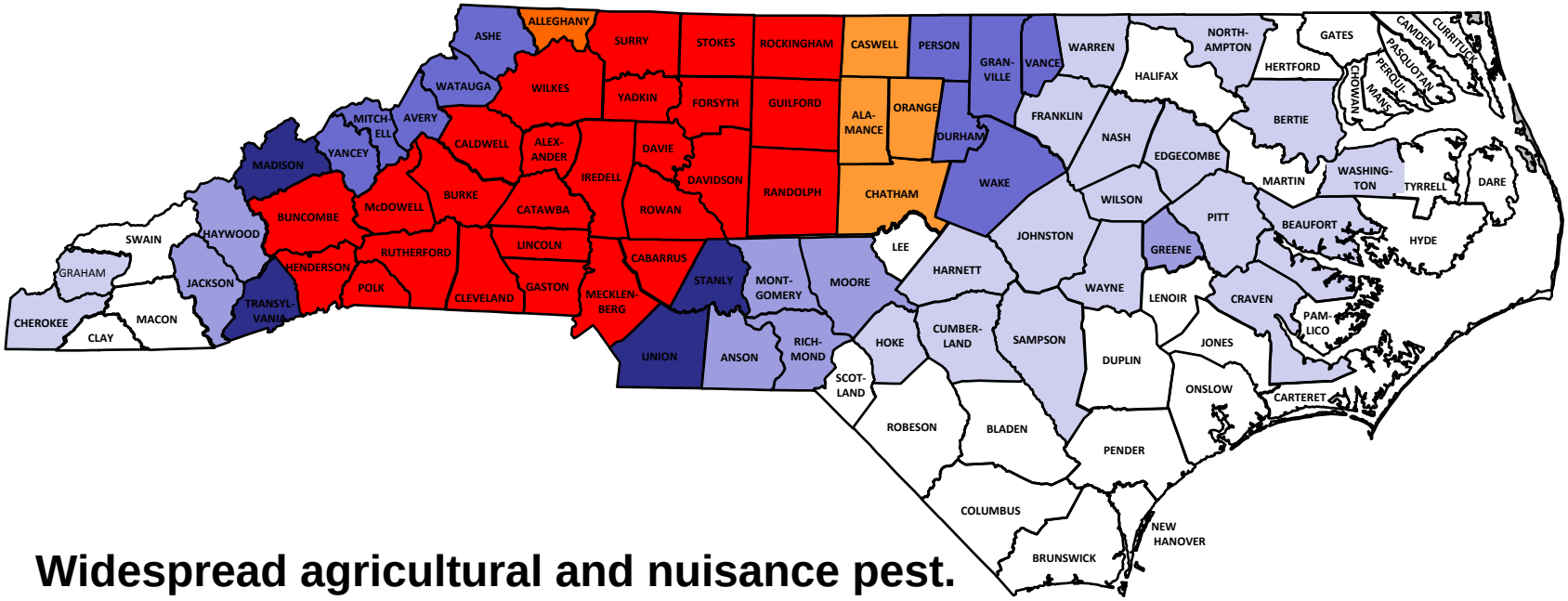
- BMSB expanding its range in TN
- BMSB is a significant nuisance/home pest in the eastern part of the state, especially in the urban areas of Knoxville and Nashville (to a lesser extent)
- Immatures and adults are damaging some fields of corn and soybean in the eastern 1/3 of the state
- Nuisance pest in the middle part of the state; suspect gaining a foothold and more common than known in crops in that part of the state.
- Low, but reproducing populations, in soybean near Memphis in 2015, but other than that, there have not been any confirmations of reproducing pest populations in the western part of the state.

Scott Stewart, University of Tennessee

Planned Projects

- Monitoring in state
- Monitoring parasitism of BMSB in soybean

Intensity of Brown Marmorated Stink Bug Populations in NC



- **Widespread agricultural and nuisance pest.**
- **Locally intense agricultural and nuisance pest.**
- **Local hotspots in residential areas.**
- **Low level populations in isolated areas.**
- **No confirmed detections.**

NC Crops with Reproducing BMSB Populations and Economic Injury

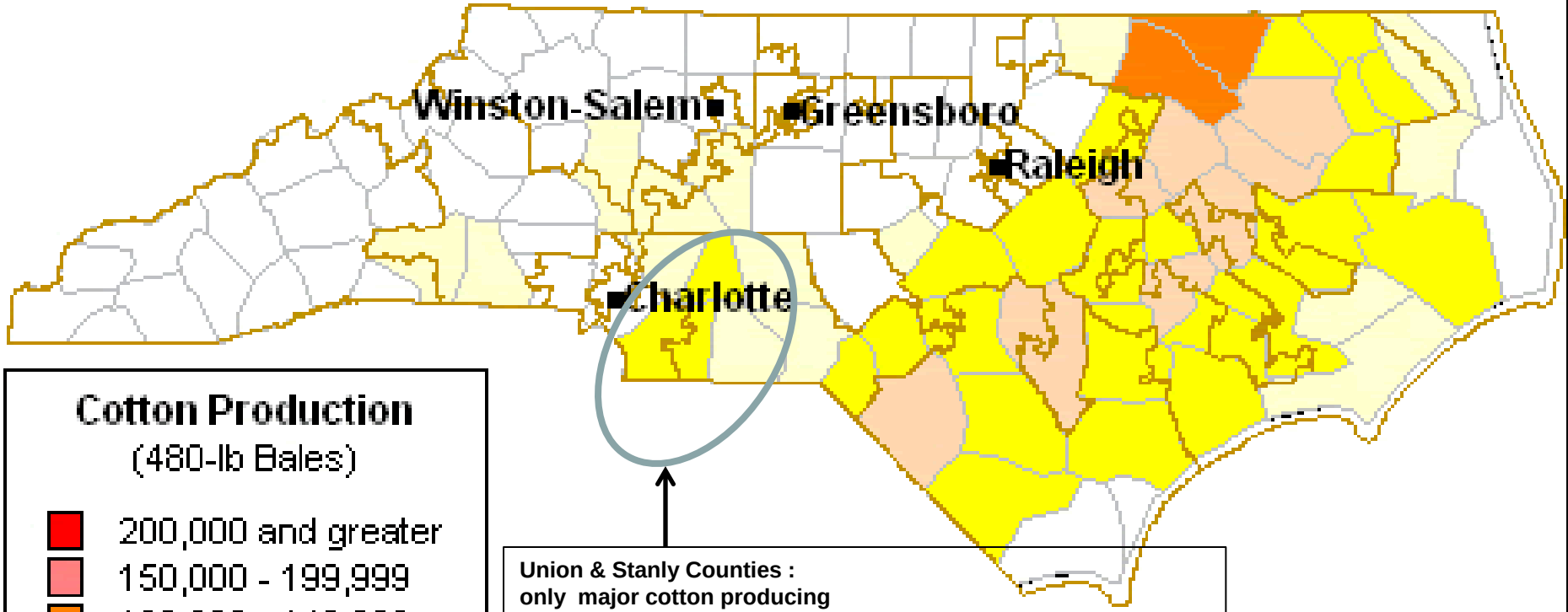
- Apples
- Peaches
- Asian Pears
- Fruiting Vegetables (Econ. damage organic only)
- Corn
- Soybean (Damage not of econ. significance)
- Pecan
- Cotton

Every nut on tree had this damage

BMSB damage to various specialty crops


Reevaluate economic threshold
Dominic Reisig, NCSU

BMSB in NC Cotton



Union & Stanly Counties : only major cotton producing areas where BMSB is a serious pest.

These counties are one of the few places in the country where significant cotton acreage and high BMSB populations occur concomitantly. Mike Toews' grad student Whitney Hadden is sampling here in a corn-cotton-soybean agroecosystem.

BMSB Monitoring in NC

- Prior to 2016, monitoring has been limited to western NC (mountains, western piedmont) where populations are most intense.
- 2016, Dominic Reisig and Mohammad-Amir Aghaee have established extensive monitoring program in cooperation with county agents in eastern NC

Important Non-Crop Habitats

- Tree of Heaven
- Catalpa
- Paulownia
- Black cherry
- Wild grape
- Black walnut
- Dogwood
- Locust
- Yellowood

BMSB Natural Enemies

- Predation (generalist predators) more important than parasitism in cropping systems
- Most prevalent egg parasitoids
  - *Telenomus podsi* (rarely complete development in BMSB eggs)
  - *Anastatus mirabilis* and *A. reduvii* (primarily in wooded habitats)
  - *Trissolcus brochymenae, T. edessae, T. euschisti*

BMSB Research Efforts in NC

Jim Walgenbach, George Kennedy
Dominic Reisig

- Overwintering ecology, phenology, and survivorship in different NC ecoregions.
- Management on tree fruits and fruiting vegetables in western NC.
- Impact of native natural enemies in managed and non-managed habitats. Monitoring for native species and potentially *T. japonicus*.
- Pheromone trapping studies this year are primarily looking at working with more user-friendly traps – small modified pyramid type traps and sticky traps.