# Distribution and Pest Status in the SE

Michael Toews, UGA

Ric Bessen, UK

Jim Walgenbach, NCSU

Glynn Tillman, ARS

Henry Fadamiro, AU

*Funding*

USDA United States Department of Agriculture National Institute of Food and Agriculture

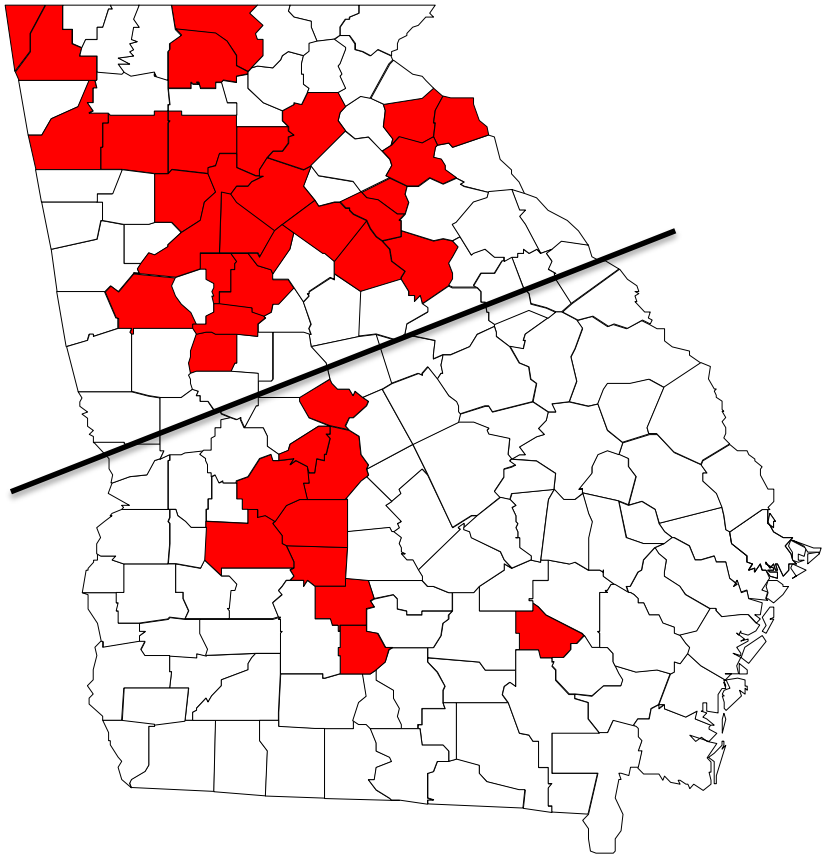
Specialty Crop Research Initiative

*Collaborating Institutions*

ars · NC State University · PennState · OSU Oregon State · University of Maryland · University of Georgia · Washington State University · Northeastern IPM Center · Cornell University · Utah State University · Rutgers University · The Ohio State University · University of Kentucky · UC Davis · University of Minnesota · Virginia Tech · Berkeley · Michigan State University · UC Riverside

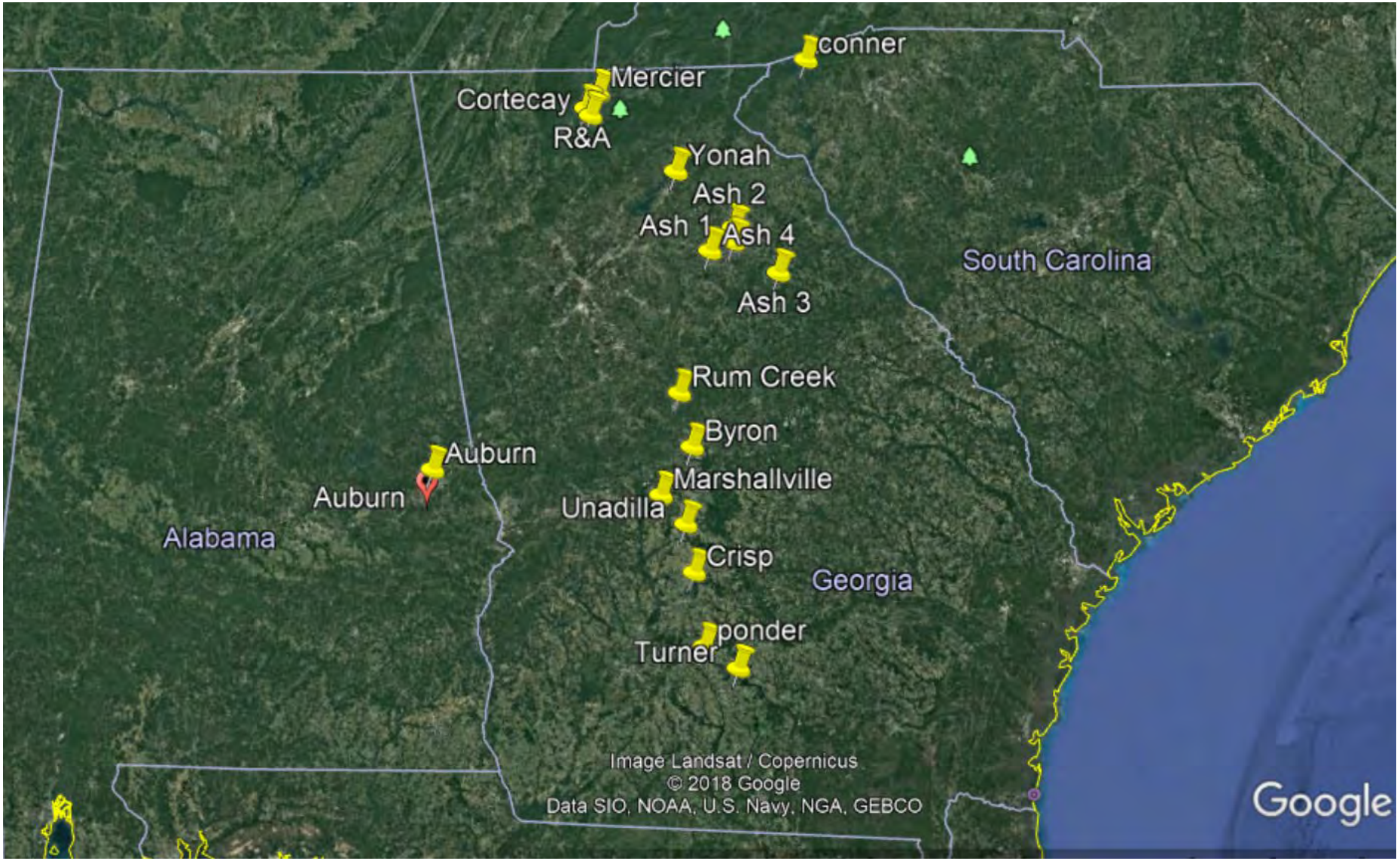
This material is based upon work that is supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, Specialty Crop Research Initiative under award number 2016-51181-25409.

# Georgia Distribution

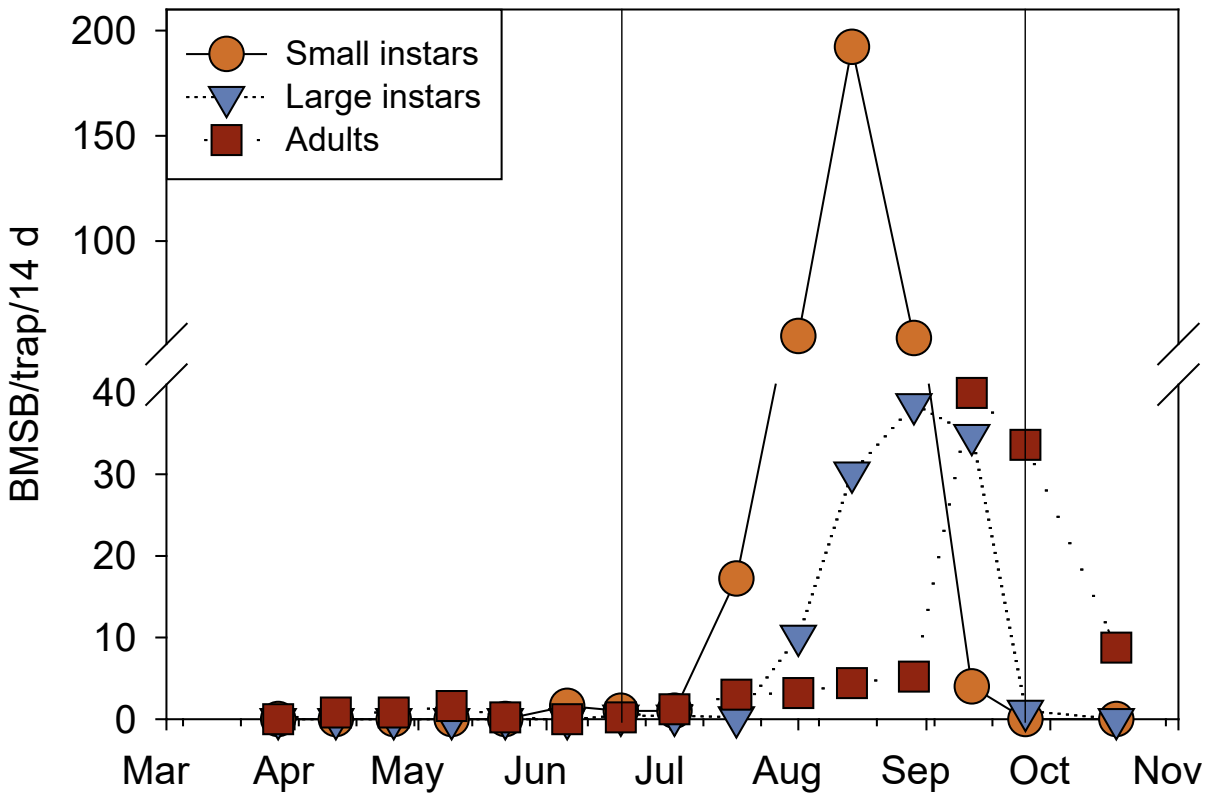



BMSB Currently detected in 36/159 counties

# Landscape Objective-Sticky Traps



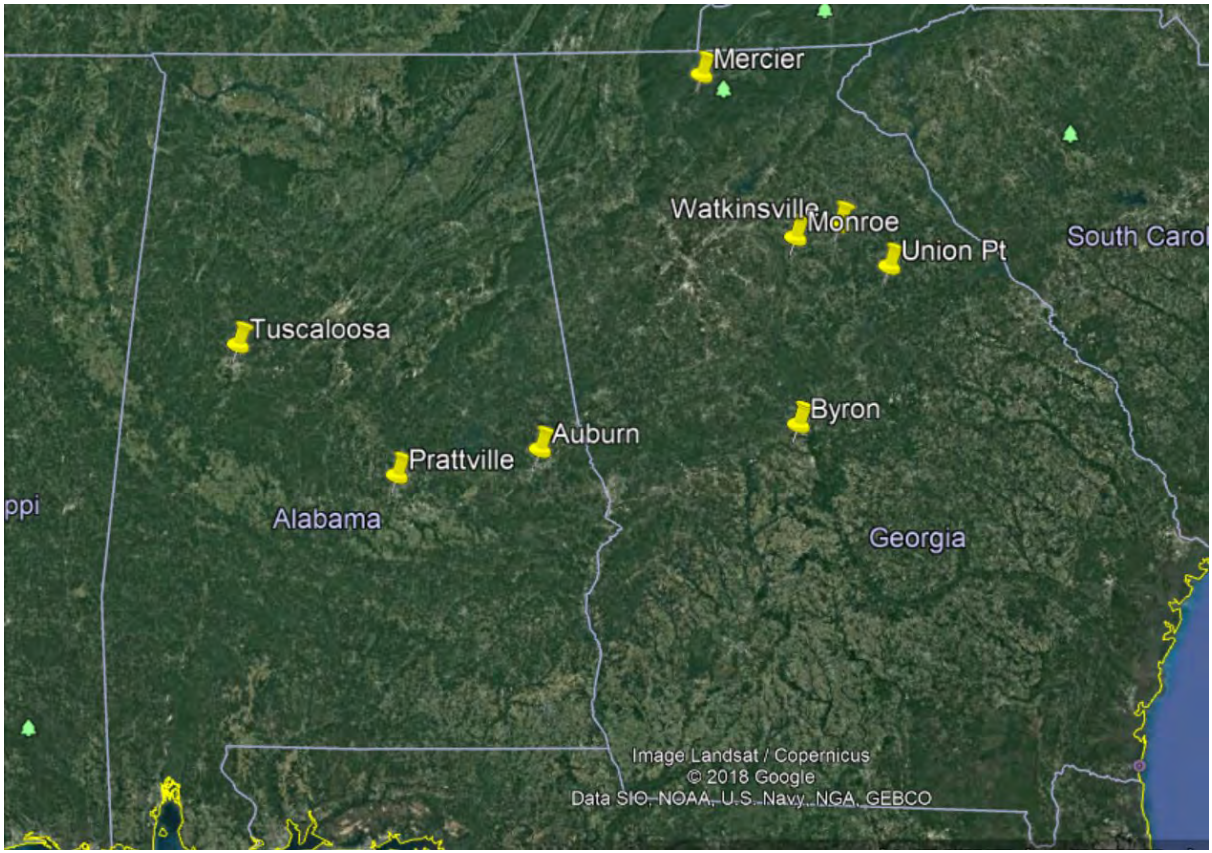
# Landscape Objective-Sticky Traps




- Traps deployed from GA/NC line (35.1489) to Tifton (31.4648)
- Population dynamics from the southern most population at Byron shown (32.7269)
- Immatures are bracketed by the summer solstice (6/21) and the fall equinox (9/22)

# Sentinel BMSB Egg Masses

- Collected <12 h old egg masses in the lab and froze at -20 C
- All frozen egg masses were ≤ 5 d old
- Distributed 20 egg masses per site (8 sites) per month (May, June, July, Aug, Sept)
- States: AL, GA



# Summary of parasitoid species parasitizing BMSB sentinel egg masses in crops and woodlands in the Southeast in 2017 and 2018

| Parasitoid species | blueberry | peach | plum | apple | grape | pecan | tomato | cotton | soybean | sassafras | woodlands |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Trissolcus edessae*** | 2 yrs | 2 yrs | | 2017 | 2017 | | | | 2018 | | 2 yrs |
| ***Trissolcus euschisti*** | 2 yrs | 2 yrs | 2 yrs | 2 yrs | 2 yrs | 2018 | | | | 2018 | 2 yrs |
| ***Trissolcus brochymenae*** | 2 yrs | 2 yrs | 2018 | 2 yrs | 2018 | [illegible] | 2018 | | | 2018 | 2 yrs |
| ***Trissolcus basalis*** | | | | | | | 2 yrs | 2017 | 2017 | | |
| ***Trissolcus solocis*** | 2018 | | 2018 | | | | | 2017 | | 2017 | 2017 |
| ***Telenomus podisi*** | 2 yrs | 2 yrs | 2018 | 2 yrs | 2 yrs | | 2 yrs | | 2 yrs | | 2 yrs |
| ***Gryon obesum*** | | 2018 | | | | | 2 yrs | | 2018 | | |
| ***Anastatus reduvii*** | 2 yrs | 2 yrs | 2 yrs | 2018 | 2018 | 2 yrs | | X | | 2 yrs | 2 yrs |
| ***Anastatus mirabilis*** | 2018 | | 2018 | | | 2018 | | | | | 2 yrs |
| ***Ooencyrtus* spp.** | 2 yrs | 2 yrs | 2 yrs | 2018 | 2017 | 2018 | 2 yrs | 2 yrs | 2 yrs | 2 yrs | 2 yrs |
| ***Acroclisoides* sp.** | | | | | | 2018 | | | | | |

No *T. japonicus*

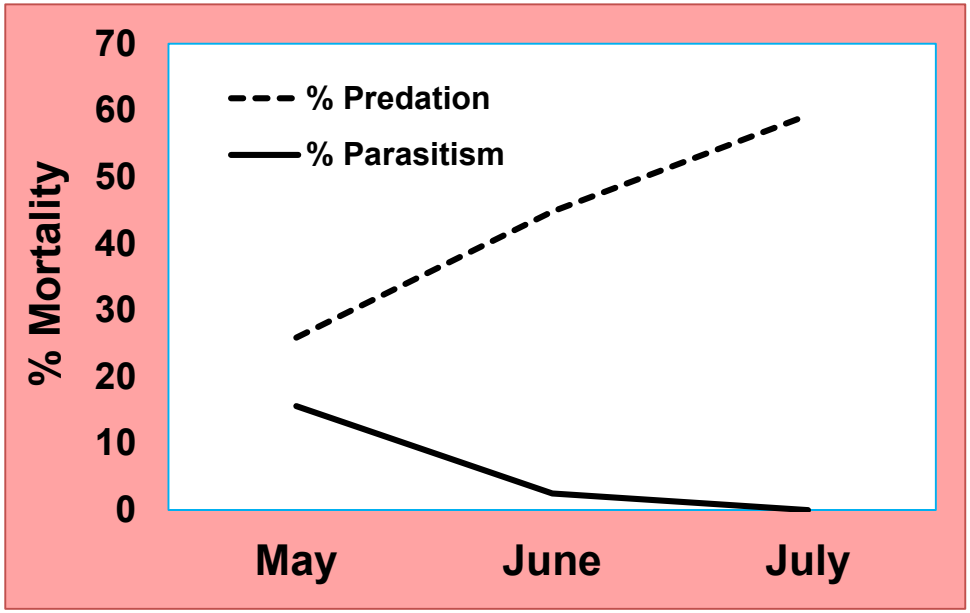
Except for *T. solocis*, all primary parasitoid species known to parasitize eggs of native stink bug species in the southeast. *T. basalis* main egg parasitoid for *Nezara viridula*, *T. podisi* main egg parasitoid for *Euschistus* spp., *T. edessae* main egg parasitoid for *Chinavia hilaris. Acroclisoides* sp., a hyperparasitoid, known to emerge from *C. hilaris* egg in woodlands. *T. basalis* and *T. solocis* new US records for BMSB.

# Black cherry in woodlands – all sites in Georgia and Alabama

3rd instar BMSB feeding on fruit of black cherry, early season host plant

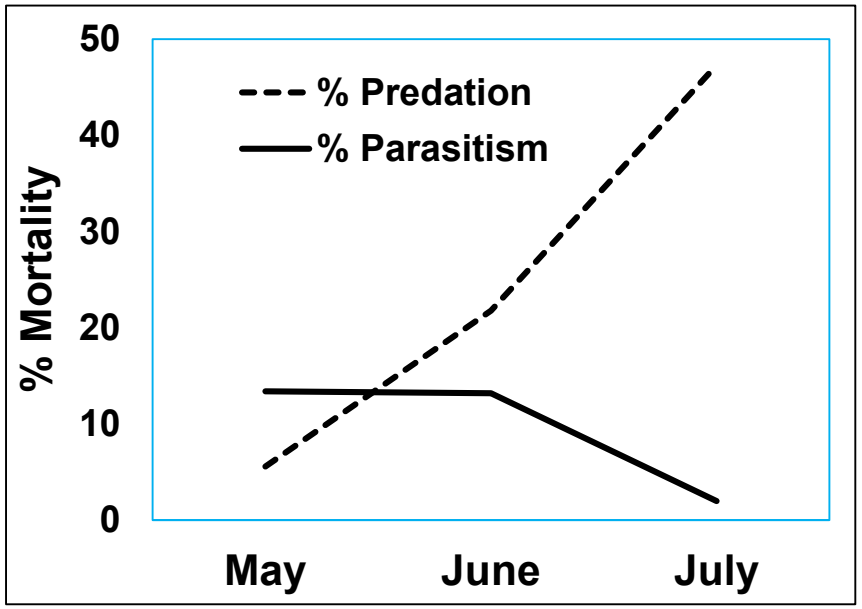
Mortality of sentinel egg masses occurred on 29 plant species in woodlands; egg masses were attacked more often on black cherry, sweet gum, water oak, sassafras, hickory, and unmanaged pecan.

**Fate of Sentinel BMSB egg masses in black cherry in woodlands in 2018**

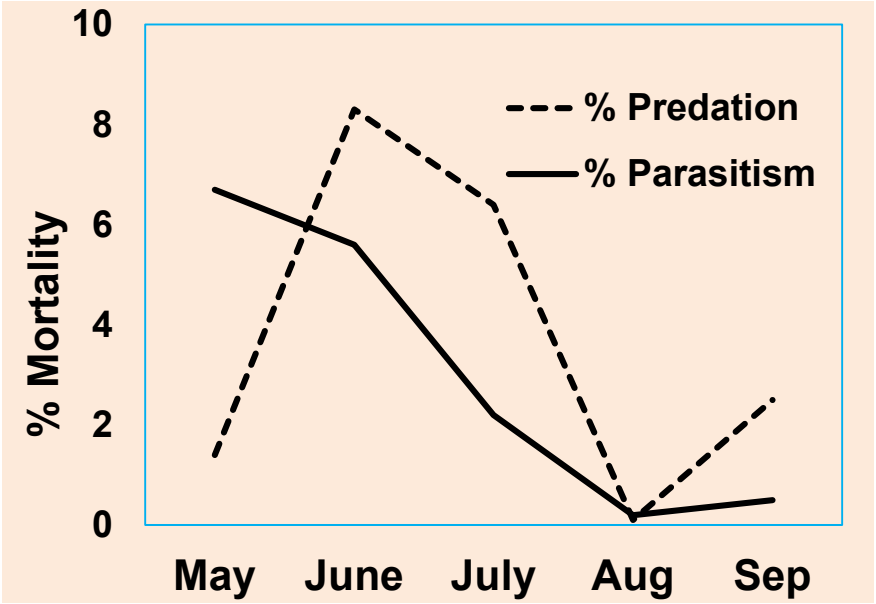


# Frank's Blueberry Organic Farm – Auburn, AL

- Within row habitat for natural enemies
- No insecticide applications
- Parasitoids: *T. brochymenae*, *T. euschisti*, *T. edessae*, *T. podisi*, *A. reduvii*, encyrtid
- Main predation: complete chewing, taken, and stylet and punctured sucking

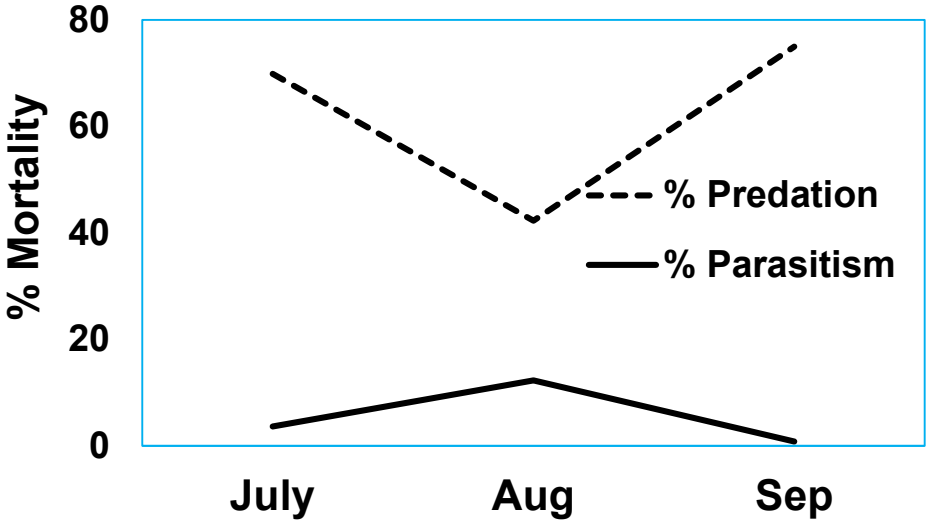
# Conventional Apple Orchards in North Georgia




Parasitoids: *T. brochymenae*, *T. euschisti*, *T. podisi*, encyrtid
Main predation: complete chewing, punctured sucking, larval lacewing hole

# Soybean - Prattville Research Center

Fate of Sentinel BMSB egg masses in Prattville soybean in 2018




Jumping spiders puncturing and then sucking on eggs of BMSB egg mass

Key predators in soybean & cotton

Ants taking eggs from BMSB egg mass in soybean

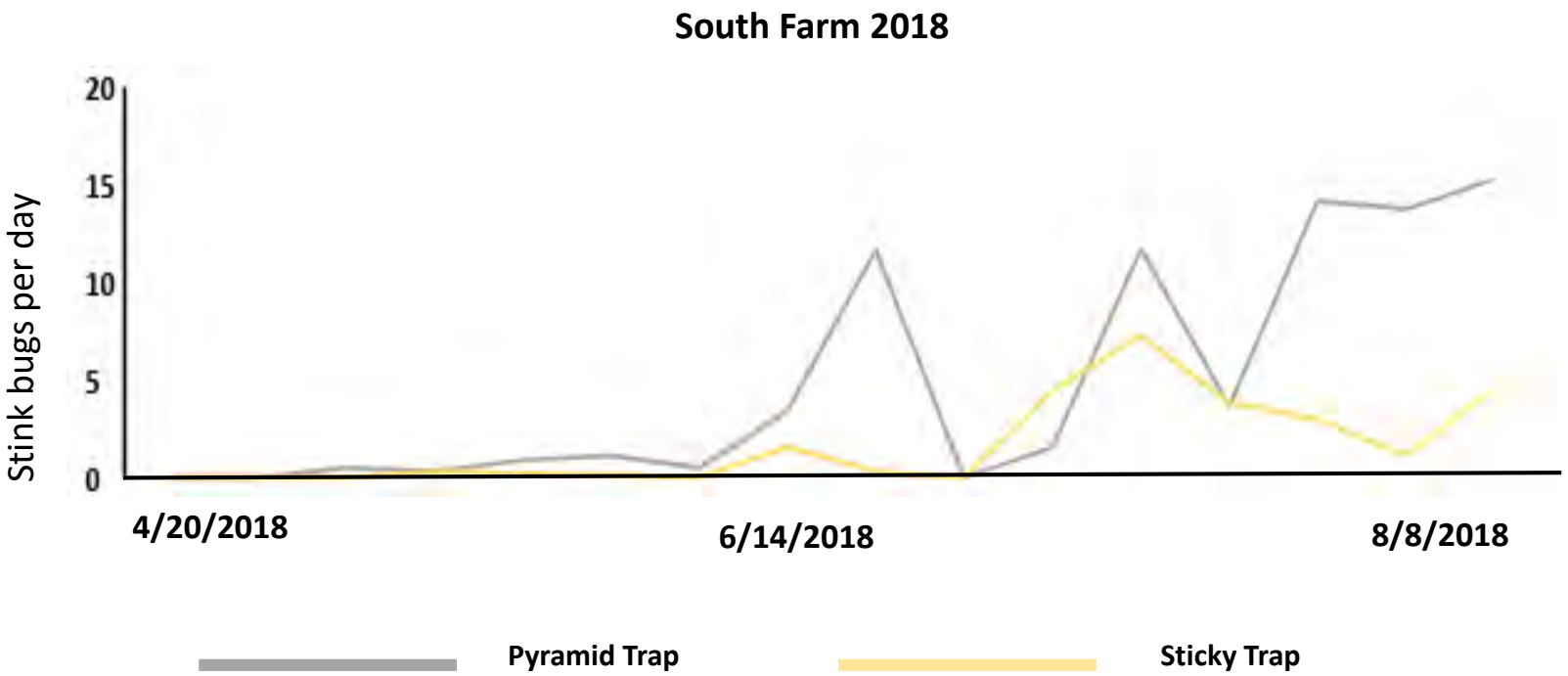
Grasshopper chewing on BMSB eggs

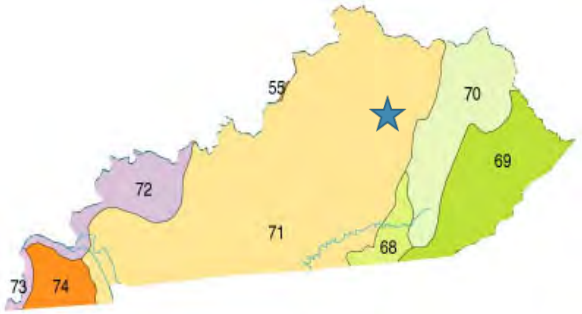
# Current Objectives

- Population monitoring
  - Across the state
- Trap type comparison
- Polyculture trap cropping
  - Japanese millet and sunflowers
- Surveying for *Trissolcus japonicus* using sleeve cages
  - Row crops - corn and soy

Sleeve cages

# Trap Type Comparison Data



# Polyculture Trap Cropping for Peppers

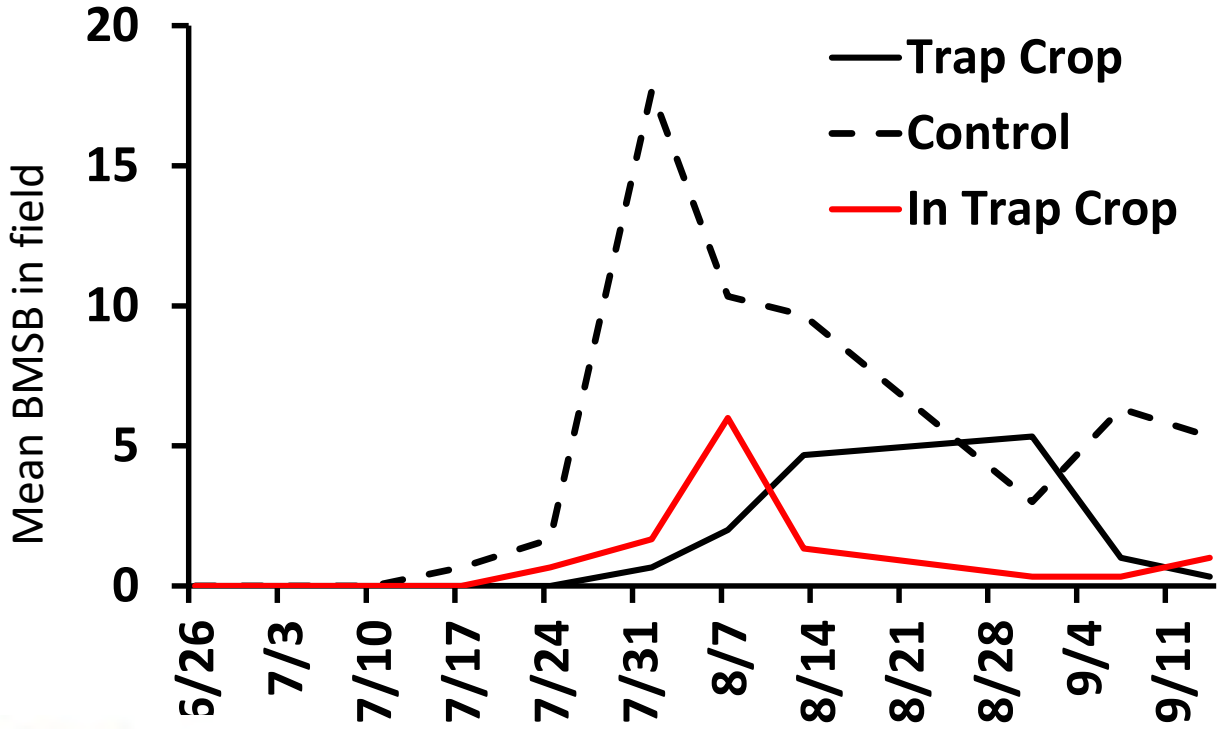
Important method of control for organic growers

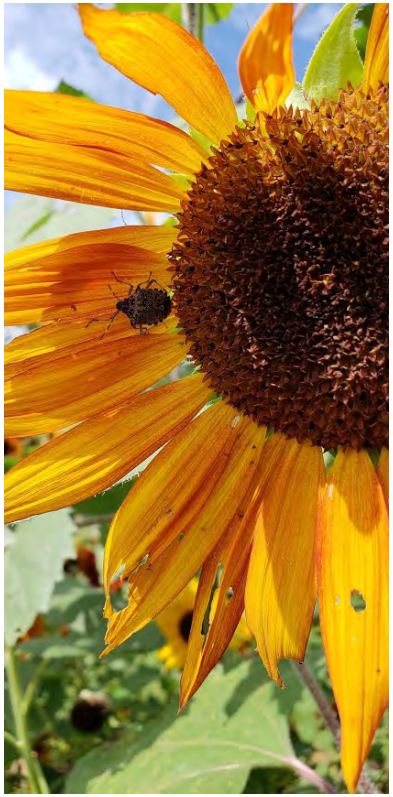
**JAPANESE MILLET**

**SUNFLOWERS**

Overlapping attractive periods

# Polyculture Trap Cropping Data



# Objectives for 2019

- Population monitoring
  - Across the state
- Trap type comparison
- Polyculture trap cropping
  - Japanese millet and sunflowers
- Surveying for *Trissolcus japonicus*
- Microsporidia
  - One location with high infection rate

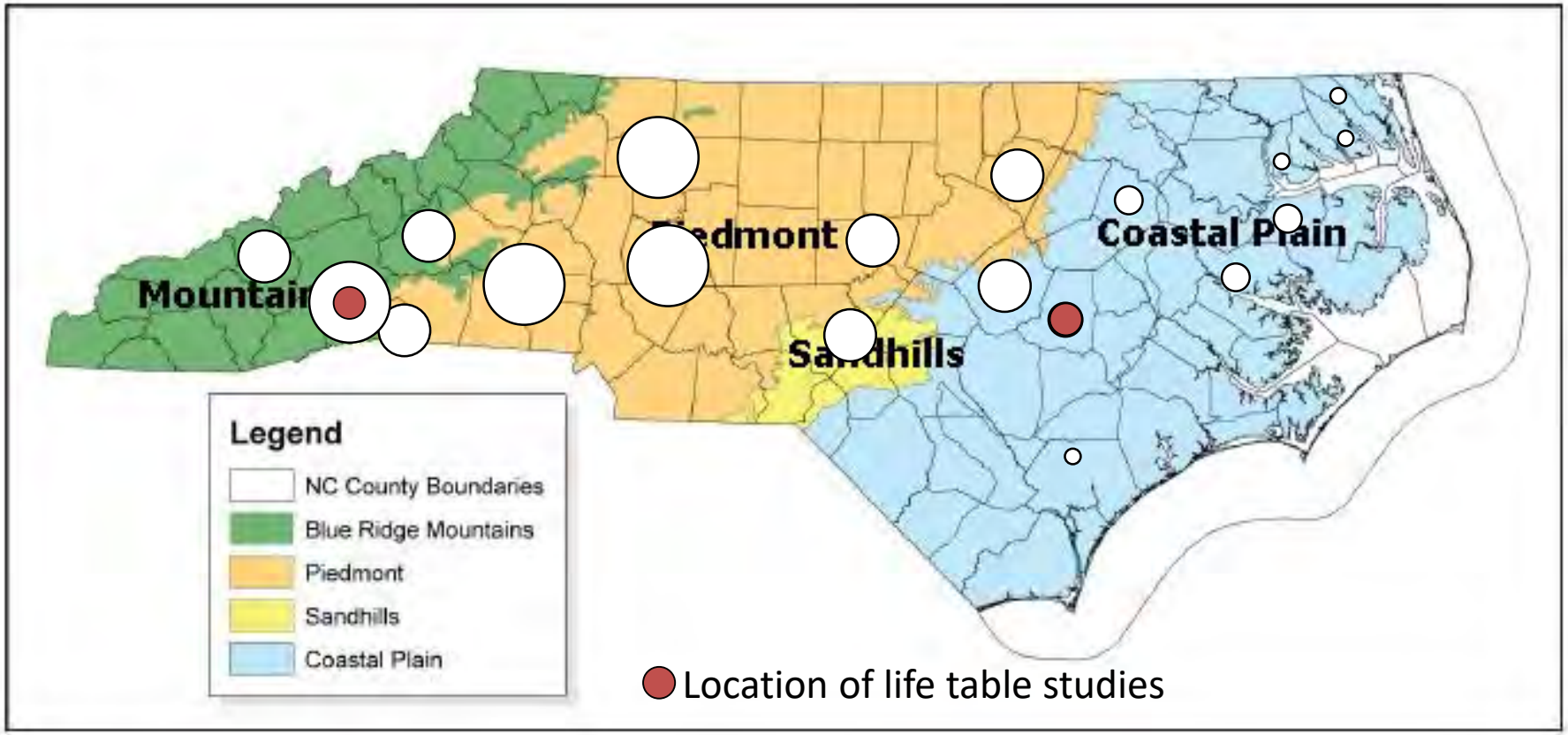
Pepper field with trap crop

Sleeve cages


# Distribution & Pest Status of BMSB in NC

- First report of BMSB in NC in 2009
  - Winston-Salem (central piedmont region)
- From 2011-2013, primarily a nuisance problem in residential cities in piedmont and mountain regions
- Large spike in damage to apples and peaches in 2015
  - Introduction of pyrethroids (2-3 applications/season) has kept damage in commercial orchards to about 1.5%
  - Damage to vegetables has been minimal, because previous management schemes accounted for stink bugs
- Populations have stabilized in Mtns and piedmont
- Populations remain very low in eastern coastal plains

# 2018 BMSB Sampling in North Carolina Ecoregions




**Season Total Captures**

0 ○ 60-150 ◯

1-20 ◯ >300 ◯

# BMSB Density vs Elevation in Western NC