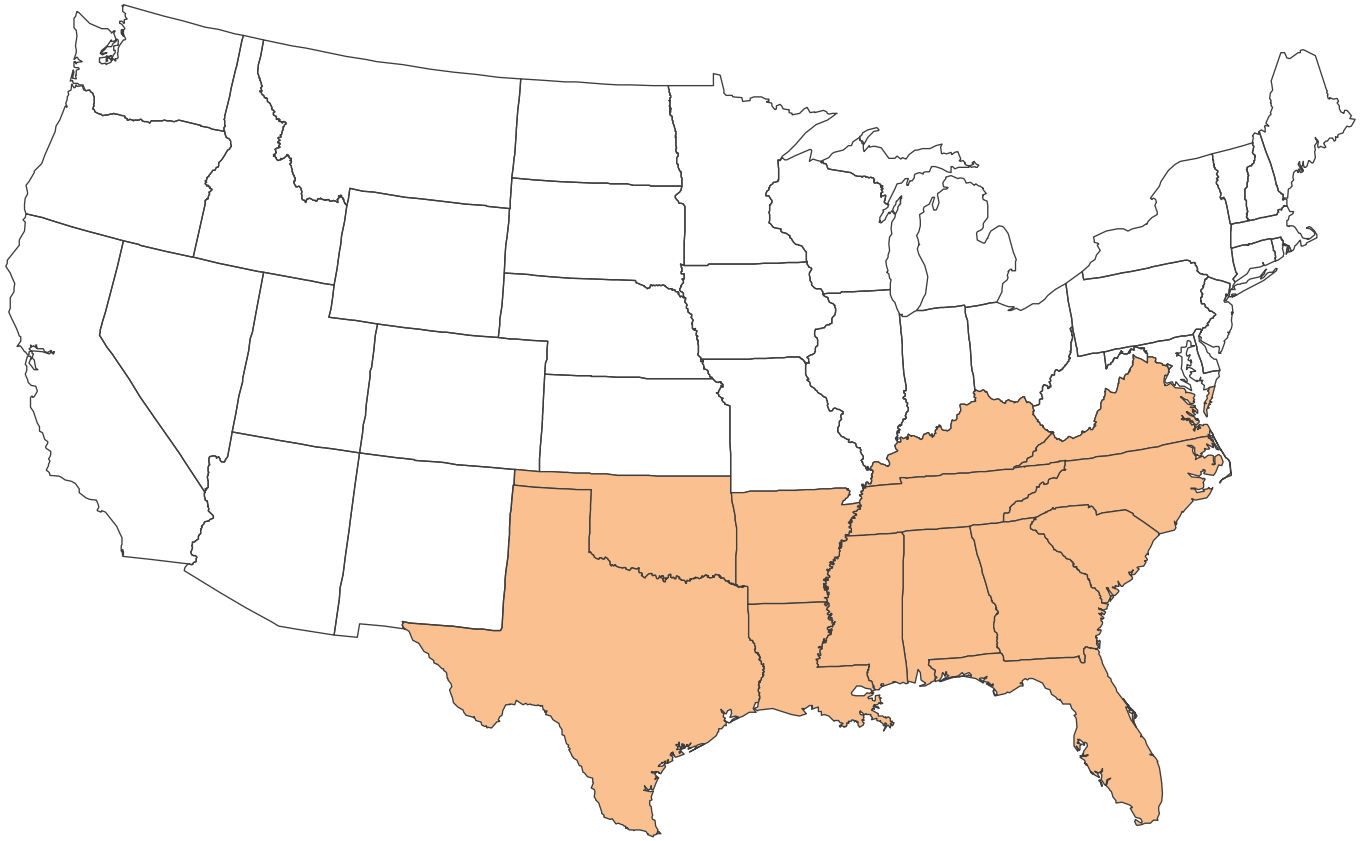
Update on BMSB in the Southern Region

Jim Walgenbach
NC State University
MHCREC, Mills River, NC

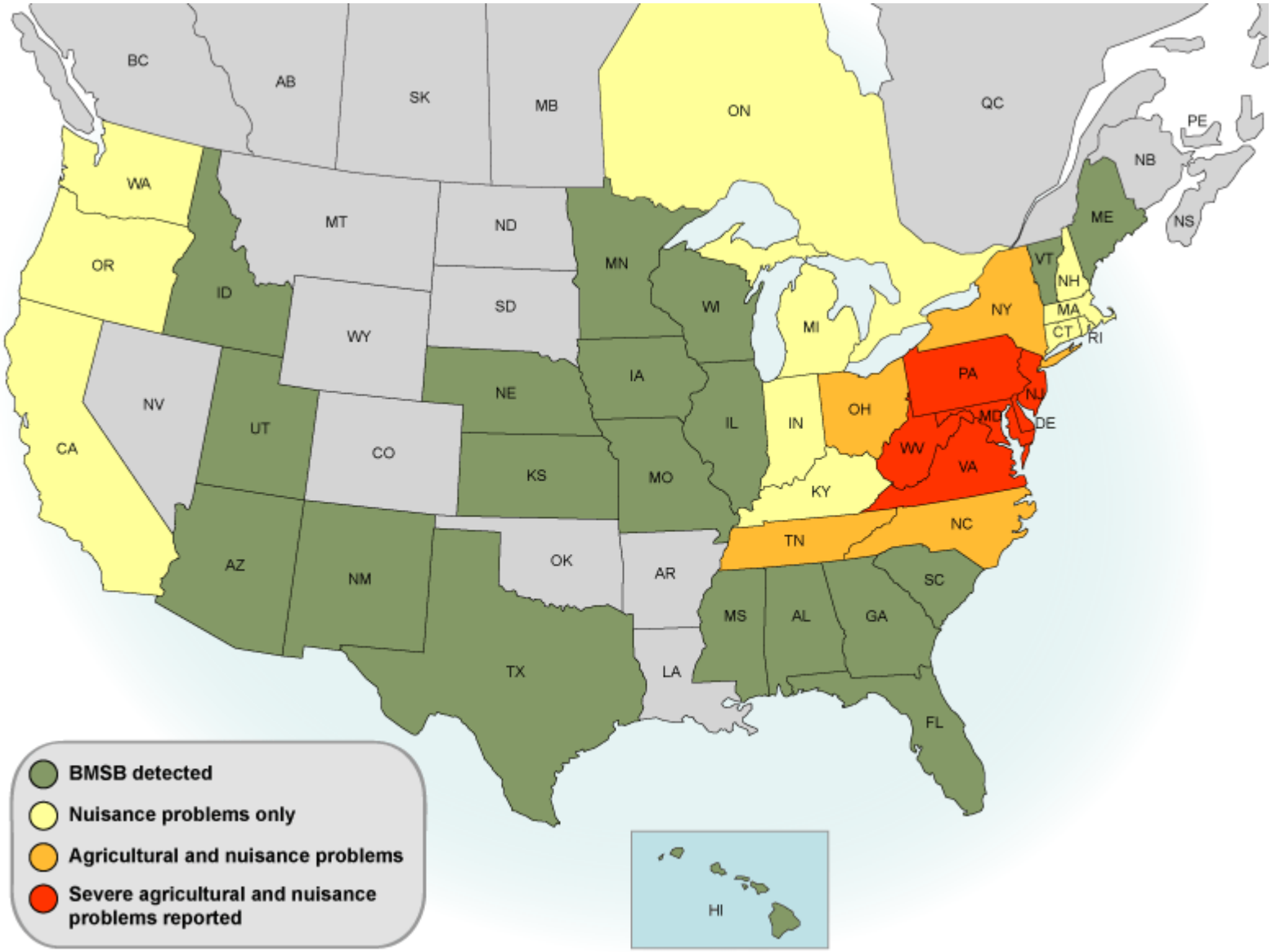
Southern Region
(Southern Region IPM Center)



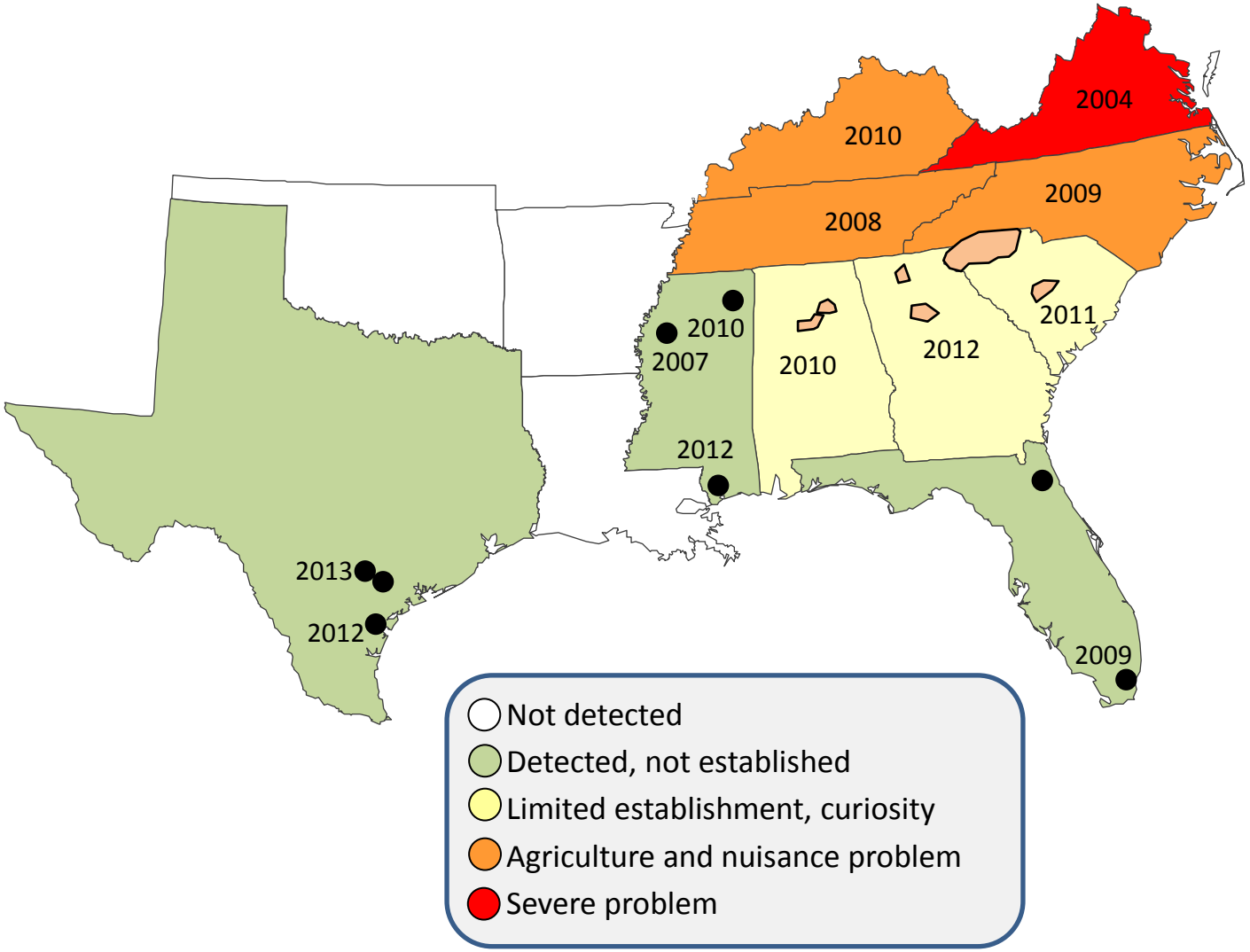
Information Provided by

Ric Bessin – Kentucky
Jeff Davis – Louisiana
Amanda Hodges – Florida
John Hopkins – Arkansas
Dan Horton – Georgia
Blake Layton – Mississippi
Ayanava Majumdar – Alabama
Russ Mizell – Flordia
Alan Morgan - Louisiana
Mary Rodgers – Tennessee
Andy Rollins – South Carolina
Powell Smith – South Carolina
Raul Villanueva - Texas

StopBMSB.org Distribution Map

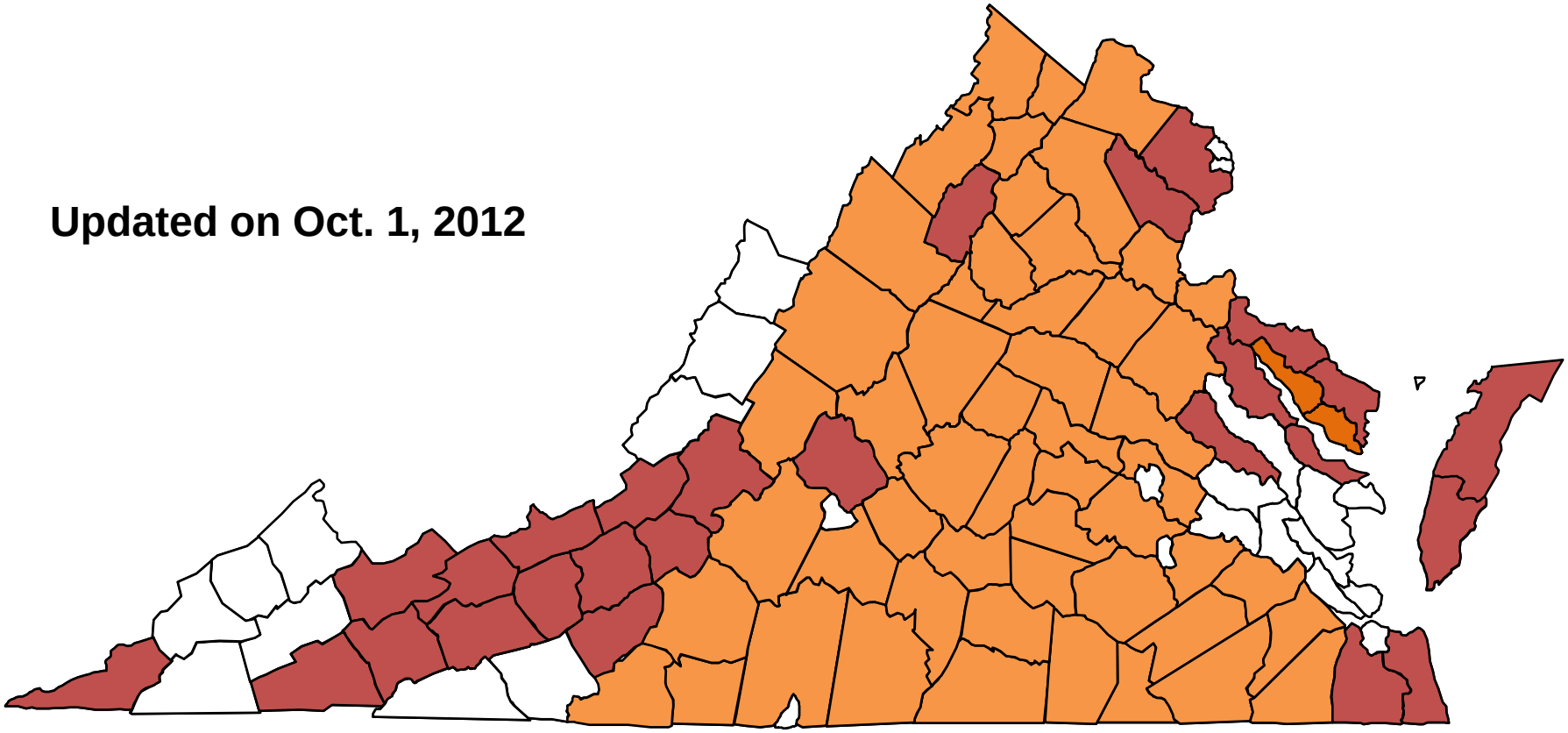


Occurrence and Distribution of BMSB in the Southern Region



BMSB Distribution in VIRGINIA

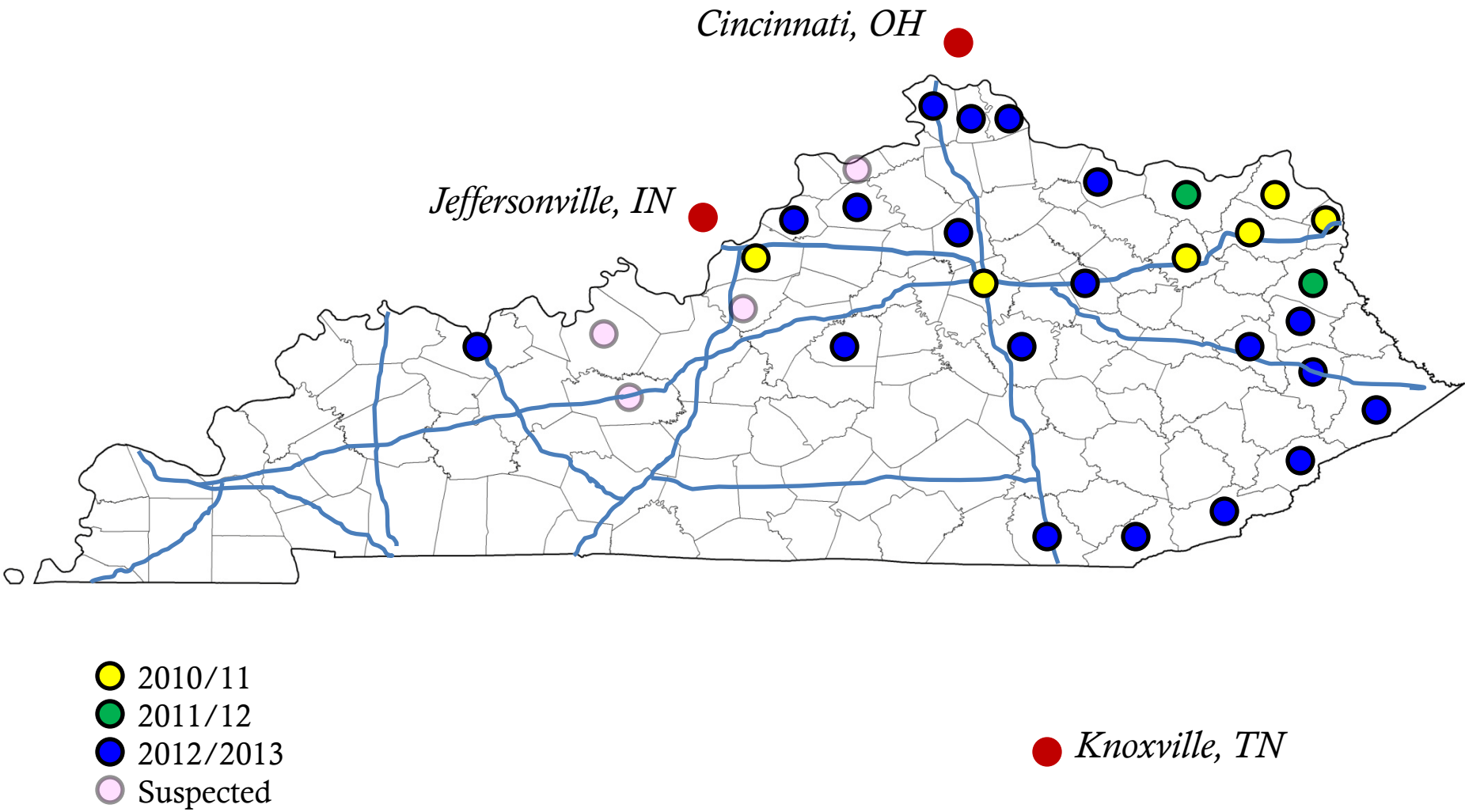
Updated on Oct. 1, 2012



- **•BMSB detected in soybeans in 44 of the 56 major soybean Cos., northernmost to the NC border**
- **•In soybean in 3 coastal plain Cos.**
- **•In one cotton field (nymph)**
- **•BMSB found in crops other than soybean**

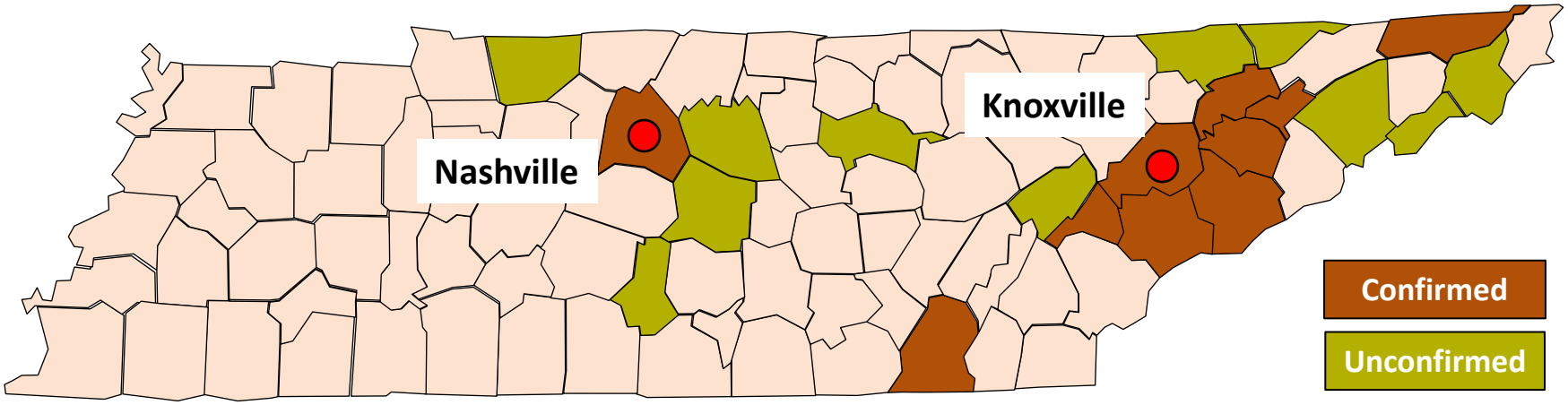
Courtesy of Ames Herbert and Tom Kuhar, Virginia Tech

Brown Marmorated Stink Bug Timeline



Courtesy of Ric Bessin, Univ. Kentucky

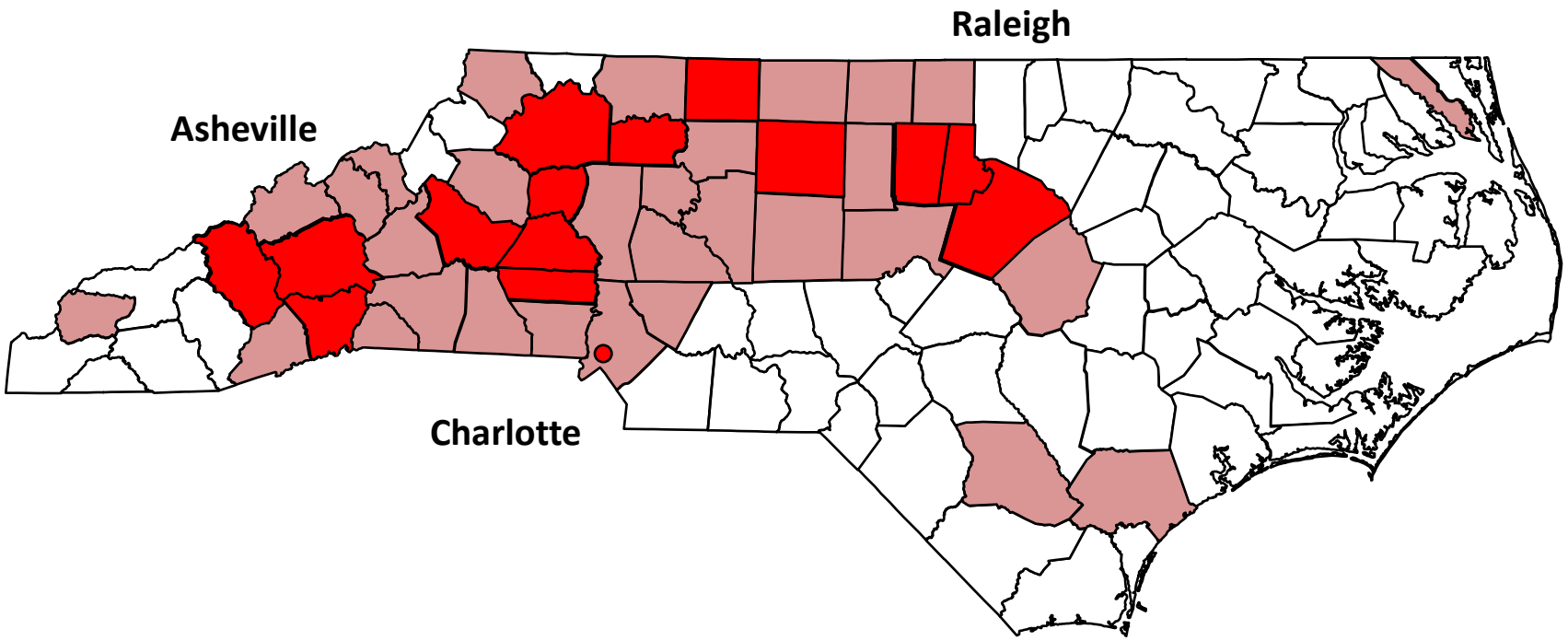
Brown Marmorated Stink Bug



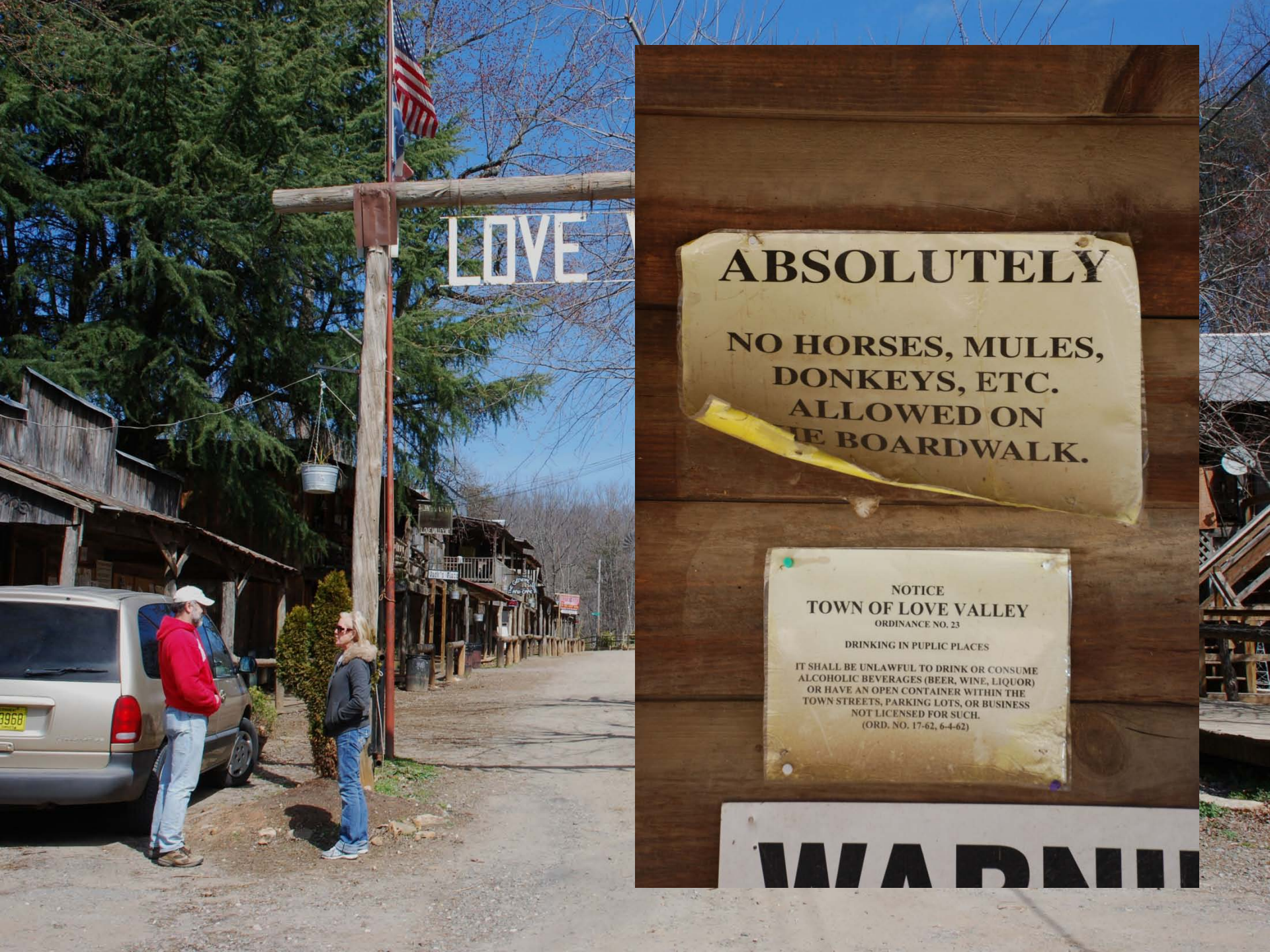
Blount, Carter, Claiborne, **Davidson**, **Granger**, Greene, **Hamblen**, Hamilton, Hancock, **Jefferson**, **Knox**, **Loudon**, Marshall, Montgomery, Putnam, Roane, Rutherford, **Sevier**, **Sullivan**, Unicoi, Wilson

Courtesy of Mary Rogers, Univ. Tennessee

Brown Marmorated Stink Bug in North Carolina




SR 1583 MOUNTAIN VIEW RD
Town of
LOVE VALLEY
Cowboy Capital
WWW.TOWNOFLOVEVALLEY.COM
EST. 1954
UNITED METHODIST CHURCH
MTN. VIEW
1 MILE ON RIGHT
WELCOME
Rocky Hill Baptist Church
3 MILES
OTTARE FARM
HORSE
BOARDING
LESSONS
704-592-2791
LOVE VALLEY
PRESBYTERIAN
CHURCH
FOR SALE
TARHEEL REALTY
FOR SALE
TARHEEL REALTY
Pilgrim
Baptist Church
8 MILES

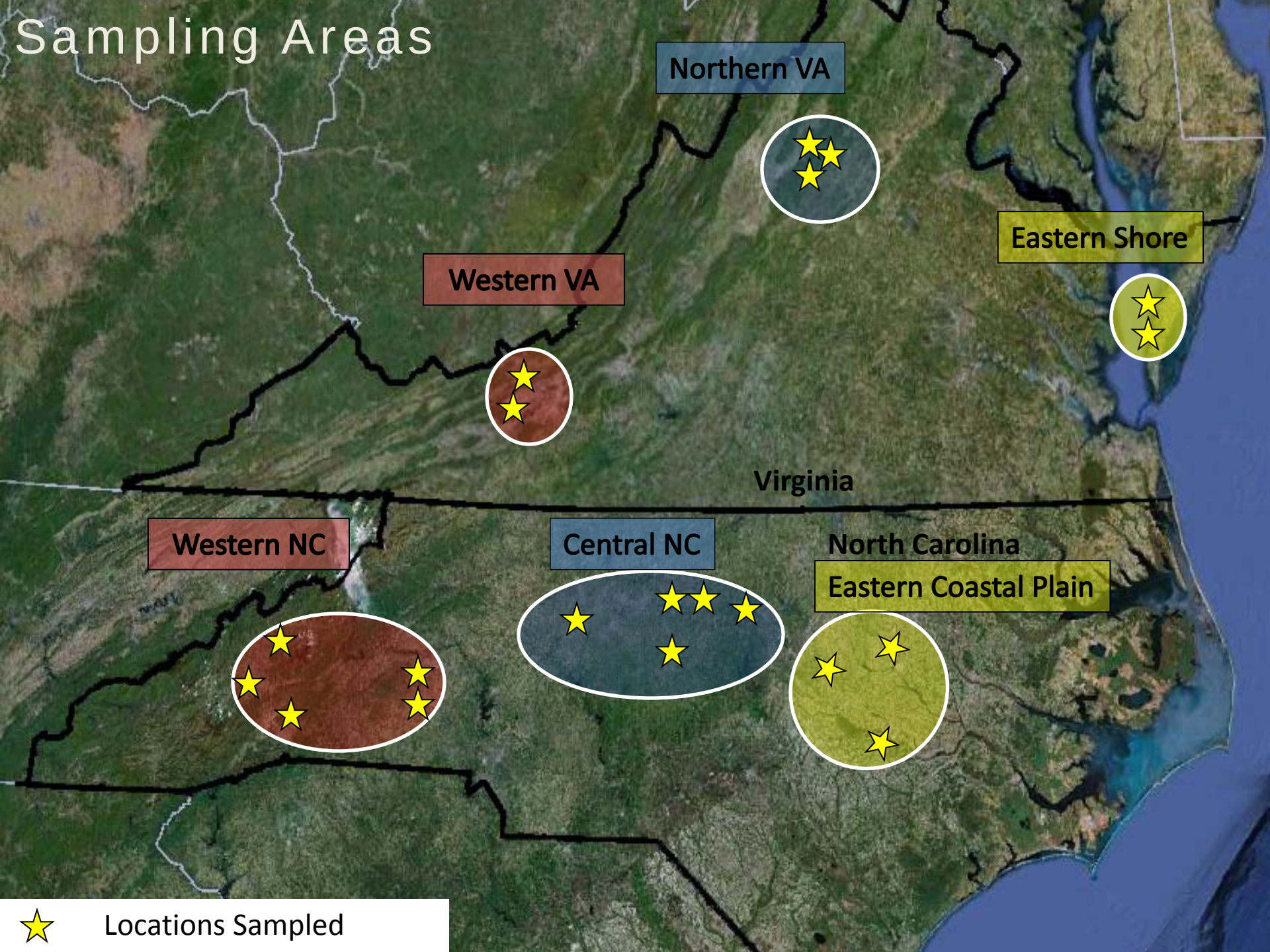

LOVE
ABSOLUTELY
NO HORSES, MULES,
DONKEYS, ETC.
ALLOWED ON
BOARDWALK.
NOTICE
TOWN OF LOVE VALLEY
ORDINANCE NO. 23
DRINKING IN PUPLIC PLACES
IT SHALL BE UNLAWFUL TO DRINK OR CONSUME
ALCOHOLIC BEVERAGES (BEER, WINE, LIQUOR)
OR HAVE AN OPEN CONTAINER WITHIN THE
TOWN STREETS, PARKING LOTS, OR BUSINESS
NOT LICENSED FOR SUCH.
(ORD. NO. 17-62, 6-4-62)

Research & Extension Personnel Working on BMSB in the Southern Region

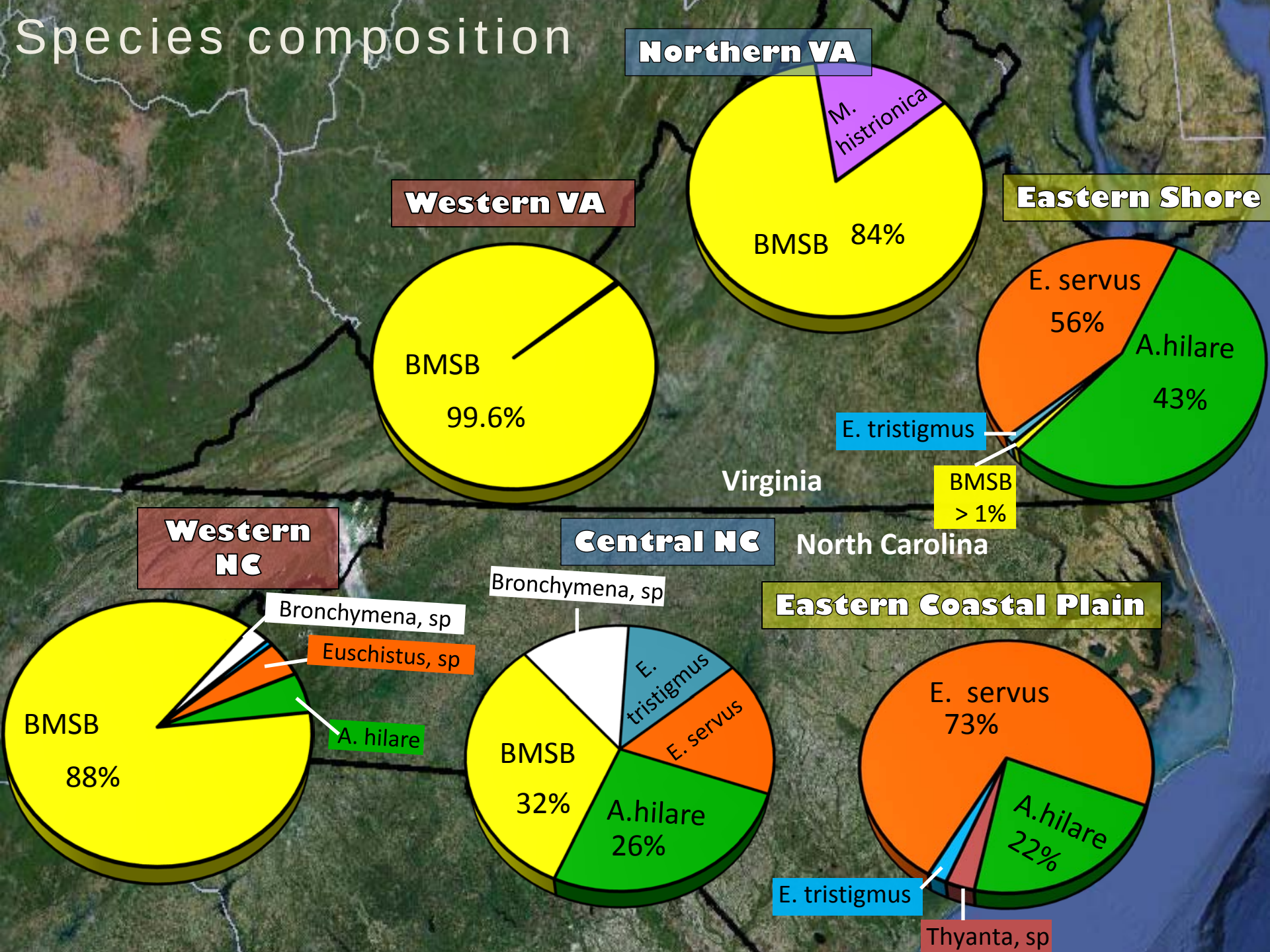
- Virginia
  - Chris Bergh (tree fruits)
  - Eric Day (pest ID)
  - Ames Herbert (field crops)
  - Tom Kuhar (vegetables)
  - Doug Pfeiffer (small fruits)
- North Carolina
  - Jim Walgenbach (fruit & vegetables)
  - Mark Abney (vegetables)
- Kentucky
  - Ric Bessin (field and specialty crops)
- Tennessee
  - Mary Rogers (organic, specialty crops)

Southern Region Sponsored BMSB Projects

- Southern Region IPM Program: Brown Marmorated Stink Bug: Impact of an Invasive Pest on Orchard and Vegetable IPM. 2011-2014
- NC State and Virginia Tech: J. Walgenbach, M. Abney, T. Kuhar.
- Objectives:
  1. Quantify stink bug species diversity, abundance, phenology, and natural enemy complex in different habitats.
  2. Evaluate damage caused by different life stages of BMSB to tomato and pepper.
  3. Determine effects of different insecticides on BMSB, and develop use guidelines for tree fruits and vegetable crops.


Sampling Areas
Northern VA
Eastern Shore
Western VA
Virginia
Western NC
Central NC
North Carolina
Eastern Coastal Plain
Locations Sampled

Species composition



Percentage of BMSB on Wild Hosts - VA

2011 (n=4854)			2012 (n=2433)	
Plant	**% of total**		**Plant**	**% of total**
Tree of Heaven	31.2		Paulownia	13.6
Paulownia	19.3		Magnolia	12.3
Mimosa	13.9		Jimson weed	10.7
Catalpa	5.1		Fig tree	13.6
Cherry	4.5		Lilac	8.6
Magnolia	4.0		Catalpa	6.9
Crape Myrtle	3.4		Mulberry	5.4
Mulberry	3.1		Redbud	4.2
Pokeweed	2.4		Bradford pear	3.3
Black Walnut	2.1		Tree of Heaven	2.2
Other (15)	11.1		Other (19)	19.2

Percentage of BMSB on Wild Hosts - NC

2011 (n=234)			2012 (n=1,409)	
Plant	**% of total**		**Plant**	**% of total**
Tree of Heaven	33.8		Tree of Heaven	19.3
Paulownia	26.5		Yellowwood	16.3
Catalpa	25.2		Catalpa	14.5
Locust	3.4		Paulownia	11.9
Dogwood	3.0		Cherry	11.7
Wild grape	2.6		Locust	8.9
Cherry	2.1		Black walnut	3.6
Black Walnut	1.3		Wild Grape	3.3
Red Maple	0.9		Sycamore	3.0
			Buckeye	1.6
Other (3)	1.2		Other (20)	5.8

Common Host Plants – NC 2012

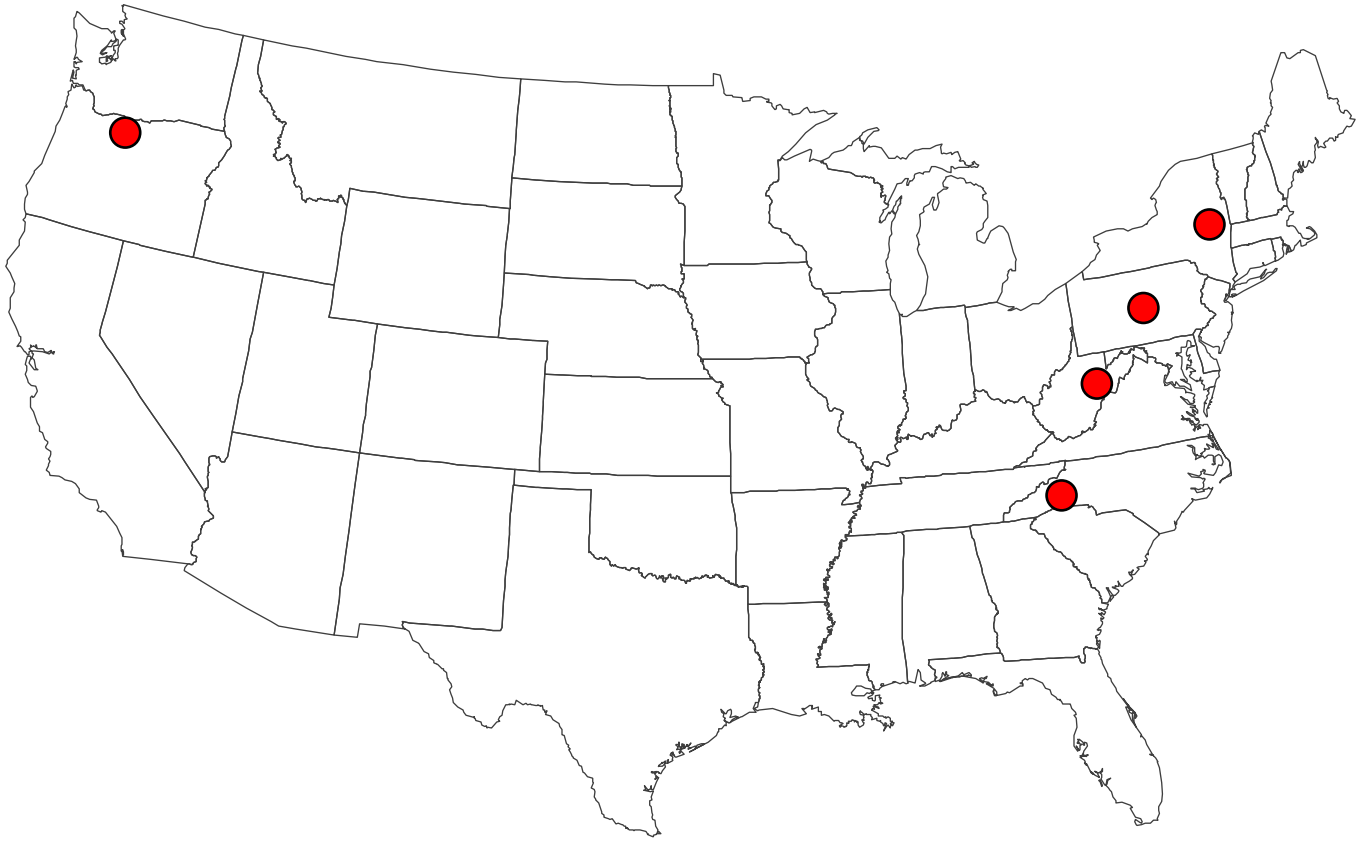
Plant	BMSB (93%)	BSB (50%)	GSB (72%)	RSB (93%)	Other (100%)
Tree of Heaven	209	1	9	1	2
Yellowwood	203	0	6	0	0
Catalpa	182	1	3	2	2
Cherry	155	0	3	12	0
Paulownia	97	0	12	4	0
Locust	69	0	0	3	0
Black walnut	48	1	3	4	2
Wild Grape	46	0	12	12	0
Sycamore	15	0	1	2	0
Buckeye	13	0	0	0	0
All other (21)	80	4	20	3	0

Voltinism Study

- Objective: To determine the maximum number of generations that occur at different latitudes.
- Ovarian development can occur at 13-15 h day length; 14 h reported most often.
- In 1012, colonies initiated with laboratory reared eggs placed in cages on date of 14-hr day length. In 2013, additional cage with overwintered adults.

Paulownia, Tree of Heaven
Green Beans, Pepper,
Sweet corn, Sunflower

Voltinism Study



Effect of Latitude on Day Length

	Day of achieved day length		
	13-h light	14-h light	Difference (d)
Hood River, OR	3 April	23 April	20
Geneva, NY	7 April	29 April	22
Biglerville, PA	9 April	4 May	25
Kearneysville, WV	10 April	6 May	26
Mills River, NC	13 April	13 May	30
Difference (d)	10	20	

Mills River, NC Voltinism 2012

Biological Period	Calendar Date	Mean Degree Days ± SE (Range)
First Generation Dev.		**542.2 ± 0.49 (541.7-542.7)**
Eggs placed in field cages	May 13	
Egg hatch	May 24-25	
First generation adults	July 17	
Second Generation Dev.		**448.9**
Eggs placed in field cages	July 26	
Second generation adults	August 29	

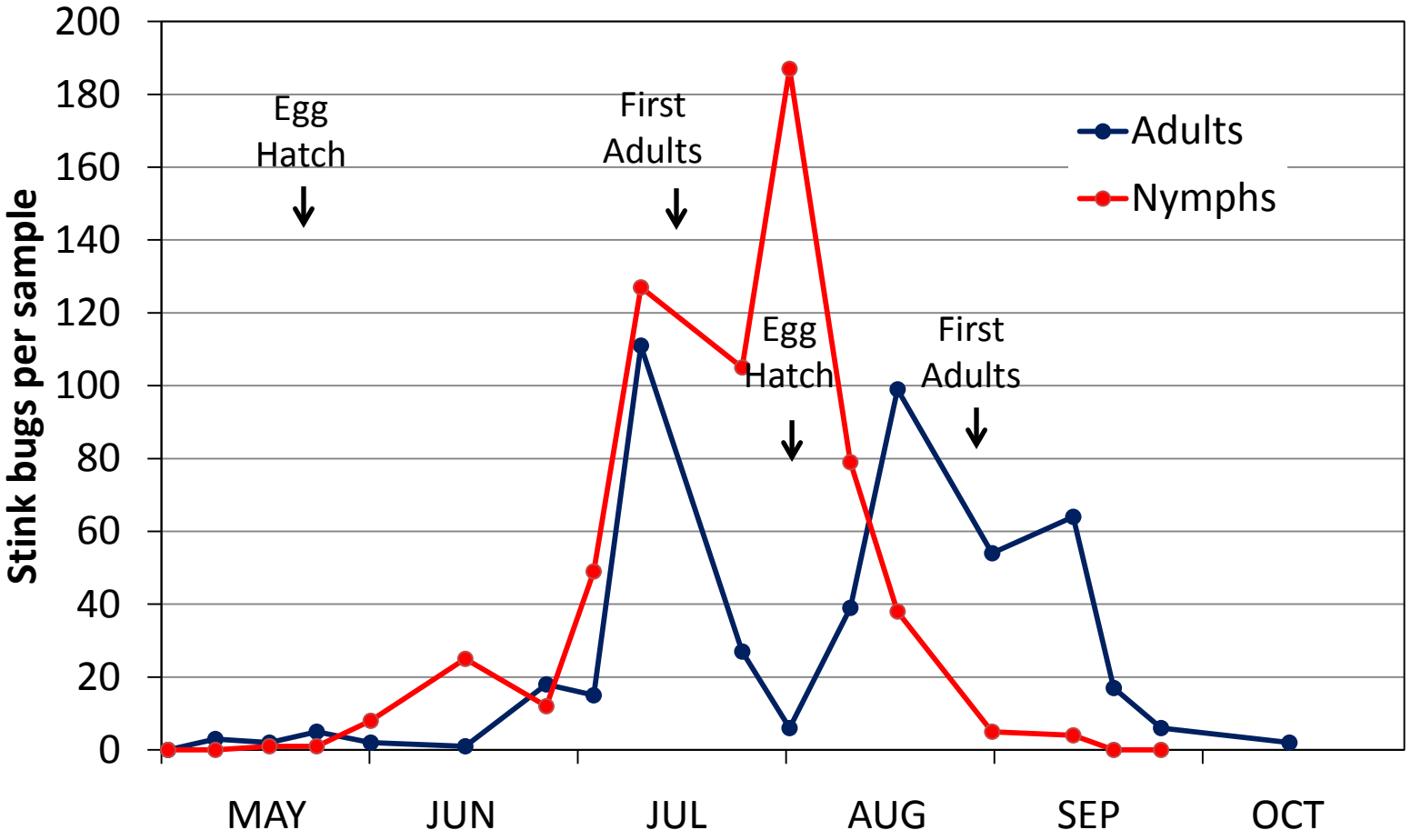
DD calculations based on Neilsen et al. (2008):

Lower threshold temp: 59°F, 15 °C

Upper threshold temp: 92°F, 33.3 °C

Total development from egg to adult = 537.6

Phenology of BMSB in Woodland Samples



Biological Control of BMSB and Native Stink Bugs on Southern Region Organic Farms

- KY, NC, TN and VA participating in USDA-OREI project.
- Sentinel egg masses deployed to assess parasitism and predation of BMSB eggs.
  - Two crops and two farms per state
- NC has expanded survey to include conventional farms, other crops, and non-managed habitats.

Fate of BMSB Eggs in Apple Orchard - 2012