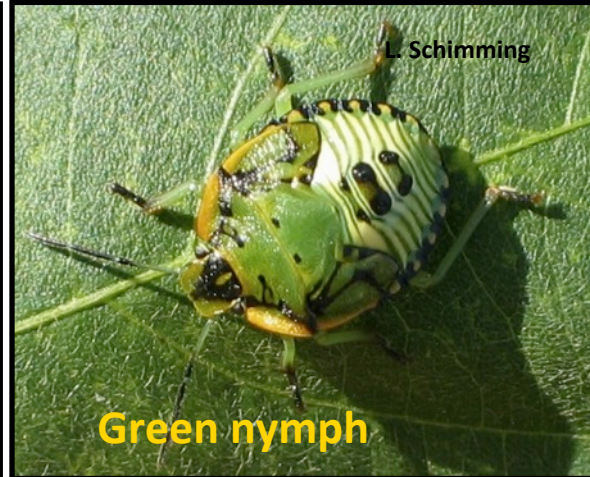


Soybean Insect Pest Management Update—2012



Ames Herbert, Virginia Tech

Stink bugs in soybean



- Stink bugs begin to migrate in large numbers into soybean fields at the R4 (full pod) soybean development stage
- Injury to soybeans includes undeveloped (flat) pods, punctured and deformed seed



Stink bug feeding can also delay maturity, causing 'stay green' syndrome

Undamaged,
maturing



BMSB damaged, 'stay-green'



Stink bug “stay-green” injury—Orange Co., VA, 2011

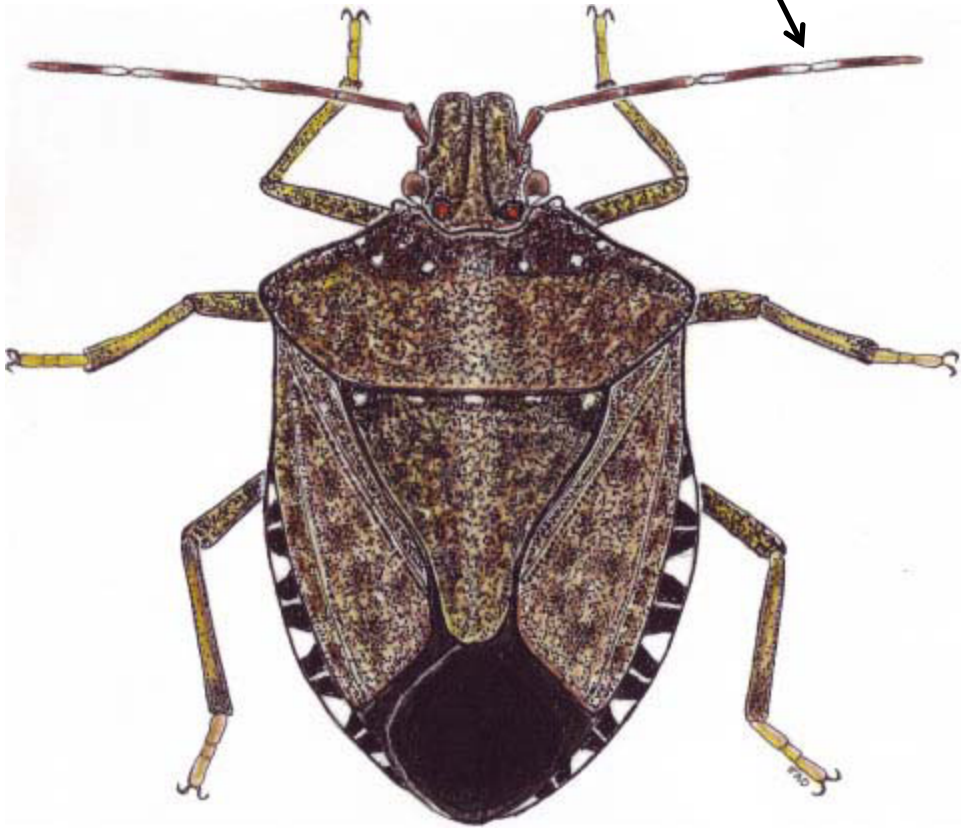


Brown marmorated stink bug (*Halyomorpha halys* Stahl)

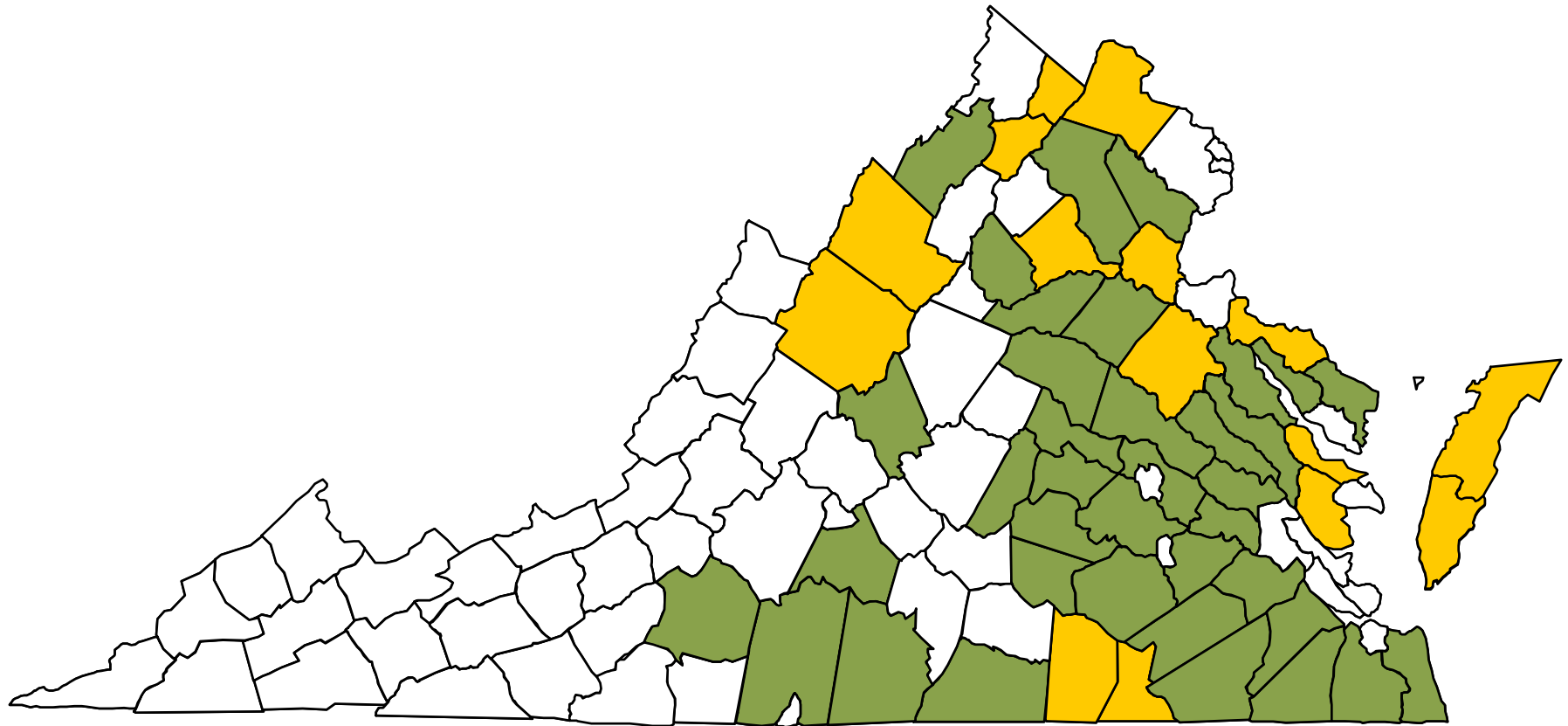
A new pest in VA
soybeans



White bands on antennae



Brown marmorated stink bug (BMSB) survey: 2010 range in Virginia soybean fields

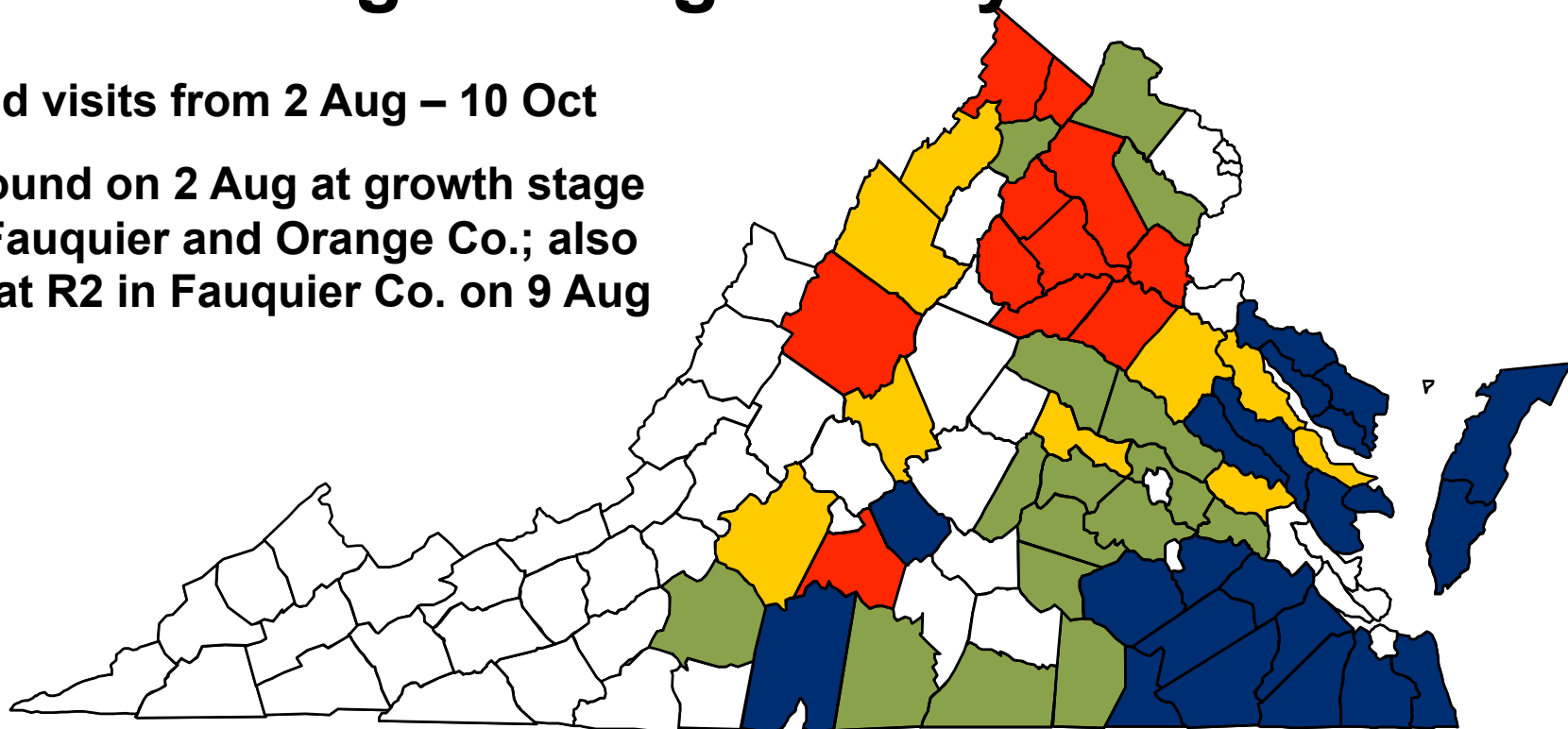


■ BMSB detected in soybean (Accomack, Augusta, Brunswick, Caroline, Clarke, Culpeper, Gloucester, Greensville, Loudoun, Middlesex, Northampton, Rockingham, Stafford, Warren, Westmoreland)

■ Soybean-producing counties

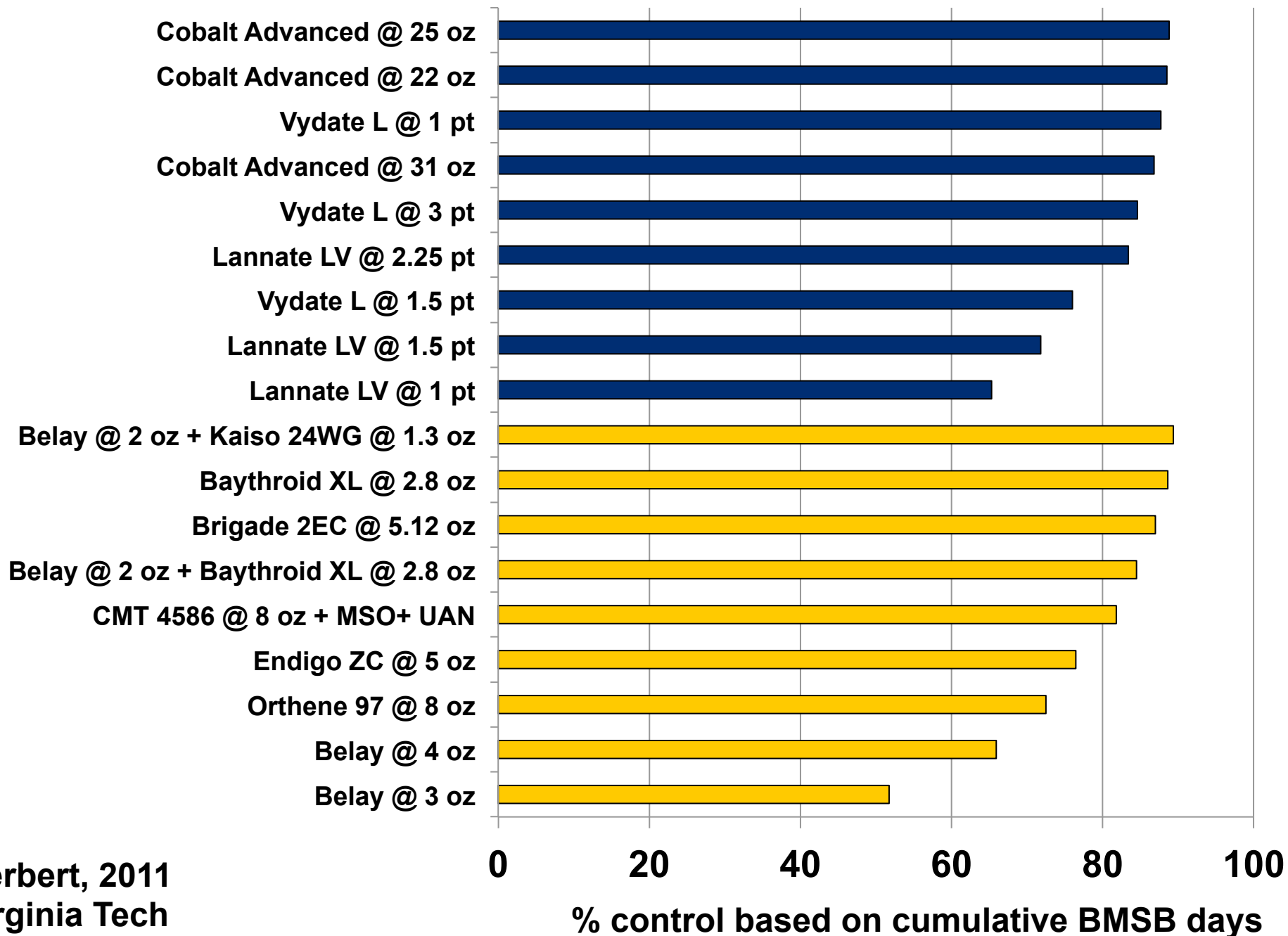
Brown marmorated stink bug (BMSB) survey: 2011 range in Virginia soybean fields

- 240 field visits from 2 Aug – 10 Oct
- First found on 2 Aug at growth stage R3 in Fauquier and Orange Co.; also found at R2 in Fauquier Co. on 9 Aug

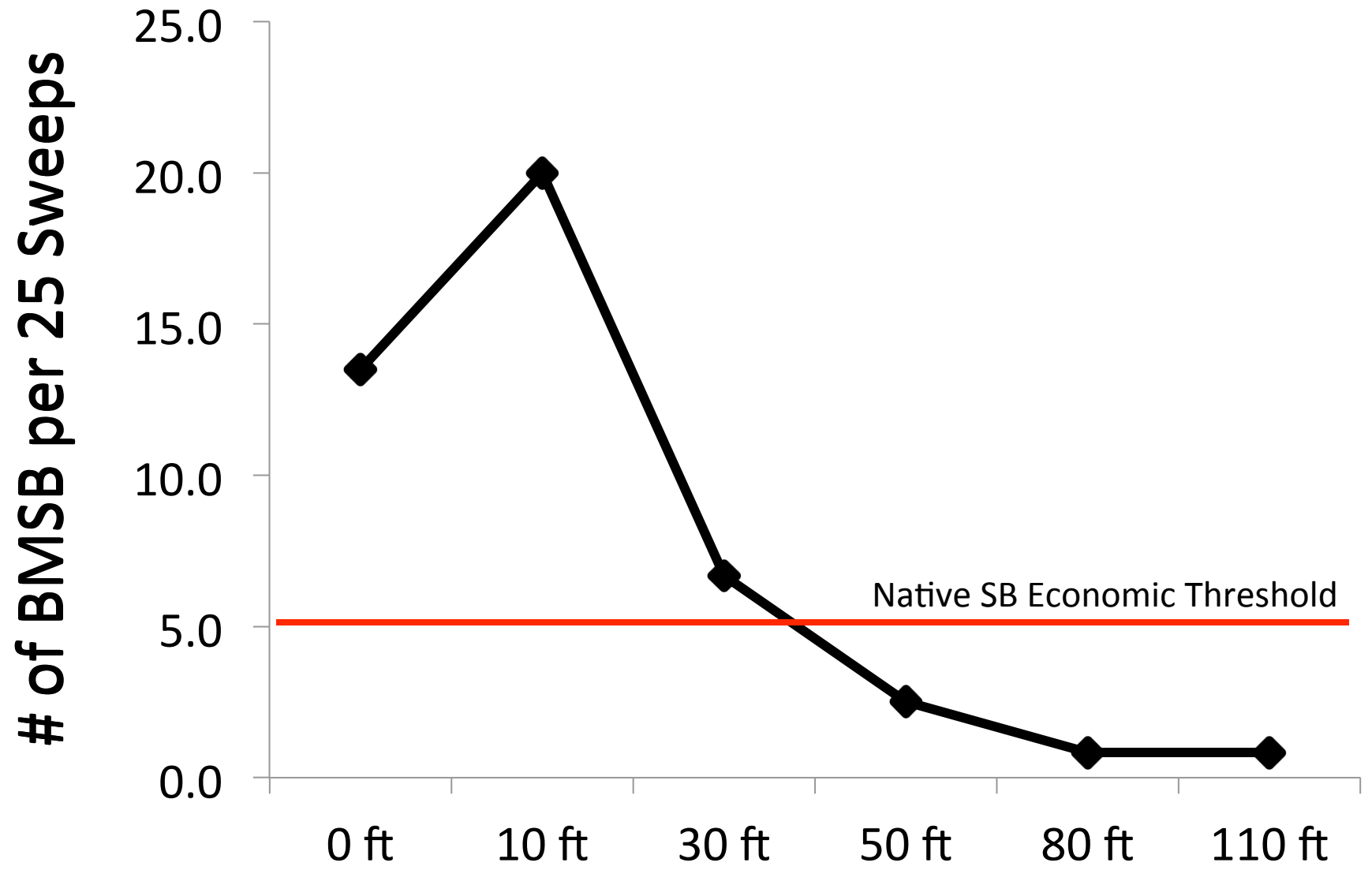


- Red** BMSB detected in soybean, > 3 per 15 sweeps (Augusta, Campbell, Clarke, Culpeper, Fauquier, Frederick, Madison, Orange, Rappahannock, Spotsylvania, Stafford)
- Yellow** BMSB detected in soybean, ≤ 3 per 15 sweeps (Bedford, Caroline, Essex, Goochland, Middlesex, Nelson, New Kent, Rockingham, Shenandoah)
- Blue** County was surveyed, but BMSB has not yet been found in soybean this season (Accomack, Appomattox, Chesapeake, Dinwiddie, Gloucester, Greensville, Isle of Wight, King & Queen, King William, Lancaster, Mathews, Northampton, Northumberland, Pittsylvania, Prince George, Richmond, Southampton, Suffolk, Surry, Sussex, Virginia Beach, Westmoreland)
- Green** Soybean-producing counties not surveyed

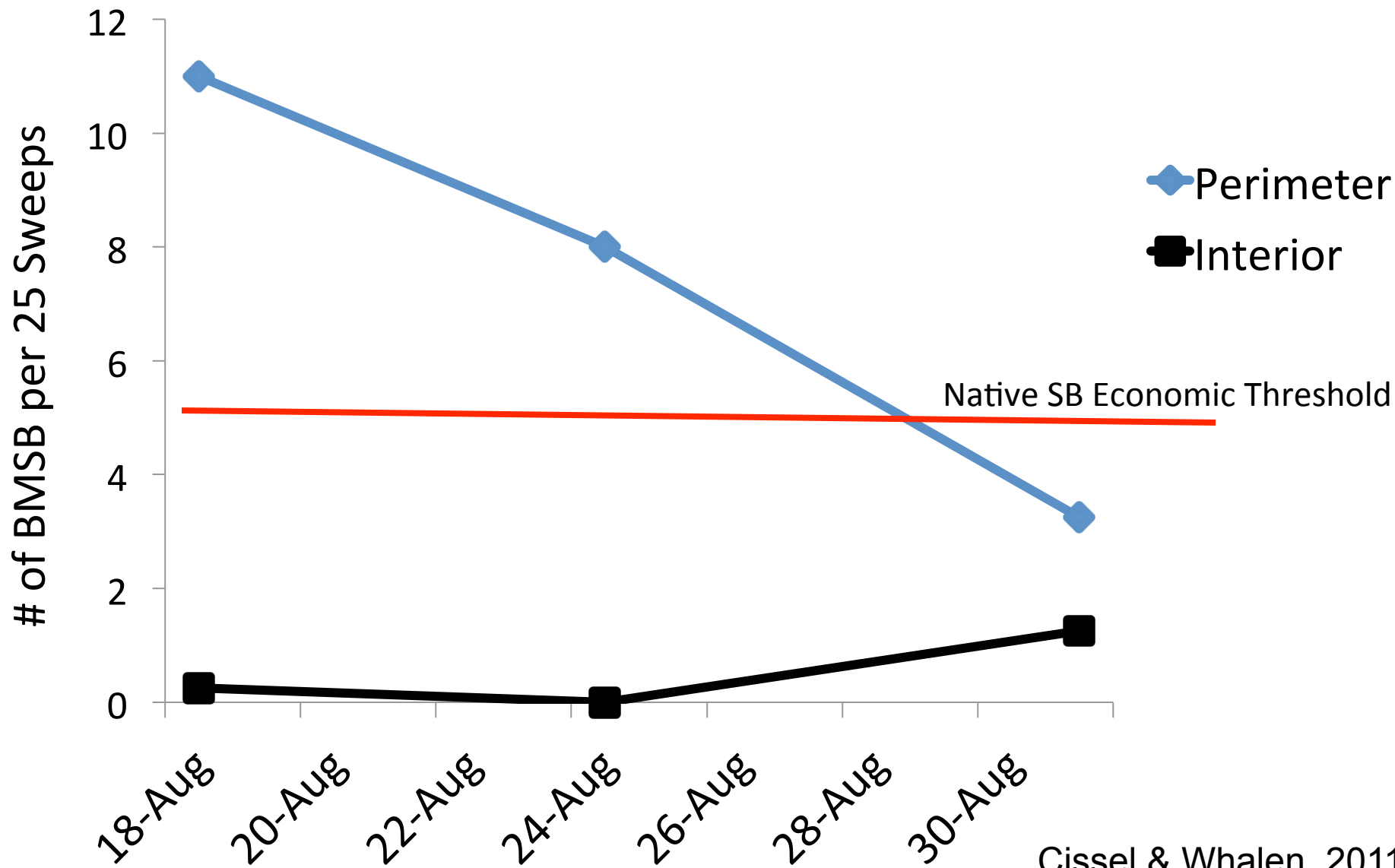
BMSB Efficacy Trials 1 and 3 in Soybean—Orange Co., VA, 2011



BMSB Soybean Field Infestation Gradient Grower # 1



BMSB Soybean Field Perimeter v/s Interior, Grower # 2



Tree of Heaven

Orange Co., VA, 2011



Tree of Heaven *Ailanthus altissima* (Mill.)



BMSB also colonizes and moves from corn fields



Effectiveness of Field Perimeter Treatments

- 12 commercial soybean fields
- Culpeper, Madison, Orange, Clarke, Stafford, Fauquier, and Augusta Cos.



BMSB edge treatments—2011

Location	Product/rate	Acres (entire field)
Culpeper et1	Lambda @ 5 oz	300
Madison et1	Acephate 97UP @ 12 oz	150
Madison et2	Acephate 97UP @ 12 oz	150
Orange et1	Acephate 97UP @ 12 oz	100
Orange et2	Acephate 97UP @ 12 oz	50
Fauquier et 01	Acephate 97UP @ 12 oz	300
Fauquier et02	Acephate 97UP @ 12 oz	220
Stafford 01	(Lannate @ 1.5 pt) Sniper @ 6.4 oz	300
Augusta et02	Sniper @ 6 oz + Warrior @ 2.5 oz	400
Madison 01	Bifenthrin @ 6 oz	300
Clarke et02	Endigo @ 4.5 oz	150
Clarke et03	Endigo @ 4.5 oz	250

BMSB edge treatments—2011

Location	Date treated	R-stage	Post-treatment sample—number per 15 sweeps									
			Date 1		Date 2		Date 3		Date 4		Date 5	
Culpeper et1	25-Aug	5	9/12	<1	9/19	<1	9/26	<1				
Madison et1	25-Aug	5	9/1	0	9/7	0	9/15	0	9/22	0	9/29	0
Madison et2	25-Aug	5	9/1	<1	9/7	<1	9/15	0	9/22	0	9/29	0
Orange et1	25-Aug	5	9/1	0	9/7	0	9/15	0	9/22	0	10/3	0
Orange et2	25-Aug	5	9/1	0	9/7	0	9/15	0	9/22	0	9/29	0
Fauquier et 01	30-Aug	4	9/12	0	9/19	0	9/26	0	10/3	0		
Fauquier et02	5-Sep	5	9/12	0	9/19	0	9/26	0				
Stafford 01	28-Sep	6	10/3	0	10/10	0						
Augusta et02	28-Sep	6	10/4	0	10/10	0						
Madison 01	28-Sep	6	10/3	0	10/10	0						
Clarke et02	28-Sep	6	10/3	0	10/10	0						
Clarke et03	28-Sep	6	10/3	0	10/10	0						

Thresholds and sampling

	# per row foot		# per 15 sweeps	
Row spacing	7-21" rows	Above 21"	7-21" rows	Above 21"
Stink bugs	1	1	2.4	3.6



Economic Thresholds

Threshold	Soybean type or stage	State
1 per 6 row feet	Seed	LA, NC
1 per 3 row feet	Grain, bloom to mid pod fill	GA, TN, MS
1 per 1 row foot	Grain, mid pod fill to harvest	GA, NC, LA, TN, AK, VA

- Have not changed much in the last couple of decades
- Based on native stink bugs

Economic Thresholds

Action Thresholds For Native Stink Bugs in Soybeans During the Pod Development and Pod Fill Stages	
Used currently in DE, MD	1 per foot of row
	5 per 25 sweeps
Some mid-south states	2 per foot of row
	9 per 25 sweeps

Based on Native Stink Bug Species

- Infestations occurring between R3 to R7 most damaging

A close-up photograph of a kudzu stem with several Kudzu Bugs (Megacopta cribraria) attached to it. The bugs are small, brown, and fuzzy, clustered along the stem. The background shows green leaves and other parts of the plant.

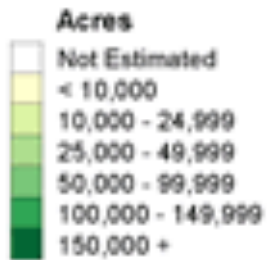
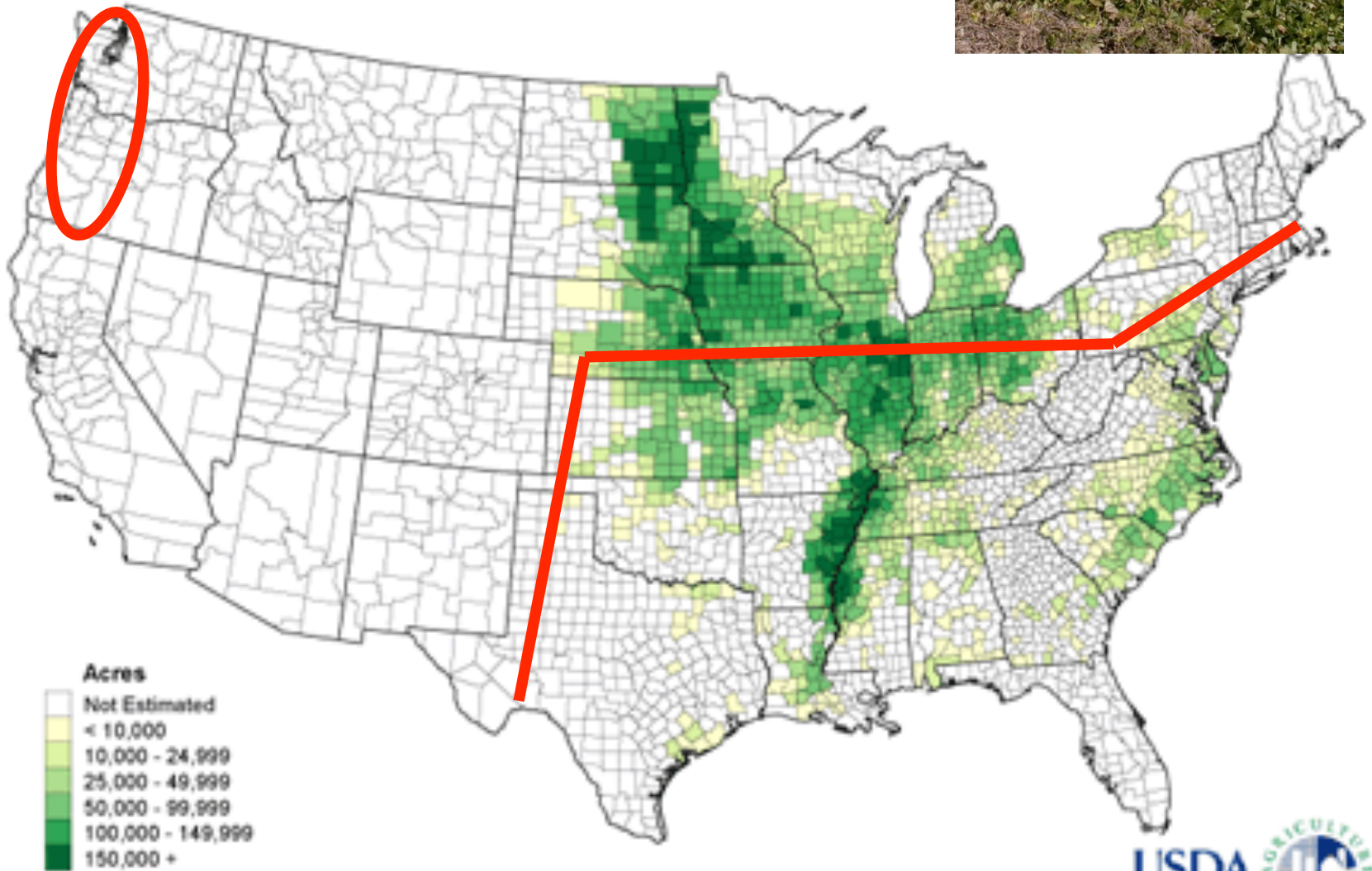
Megacopta cribraria
“Kudzu Bug”

**Wayne Gardner, Phillip Roberts, &
Dave Buntin, Univ. of Georgia
Jeremy Greene, Clemson University**

Kudzu bug biology

- **1-3 generations per year in China**
- **Overwinter in China but are active year-round in India**
- **First found in the U.S. in Georgia, 2008; soybeans in 2009**
- **Can overwinter in north Georgia**
- **Feed on soybean leaves, stems, and pods**
- **Kudzu and Wisteria are also a hosts**

Soybeans 2009 Planted Acres by County



The home invasion



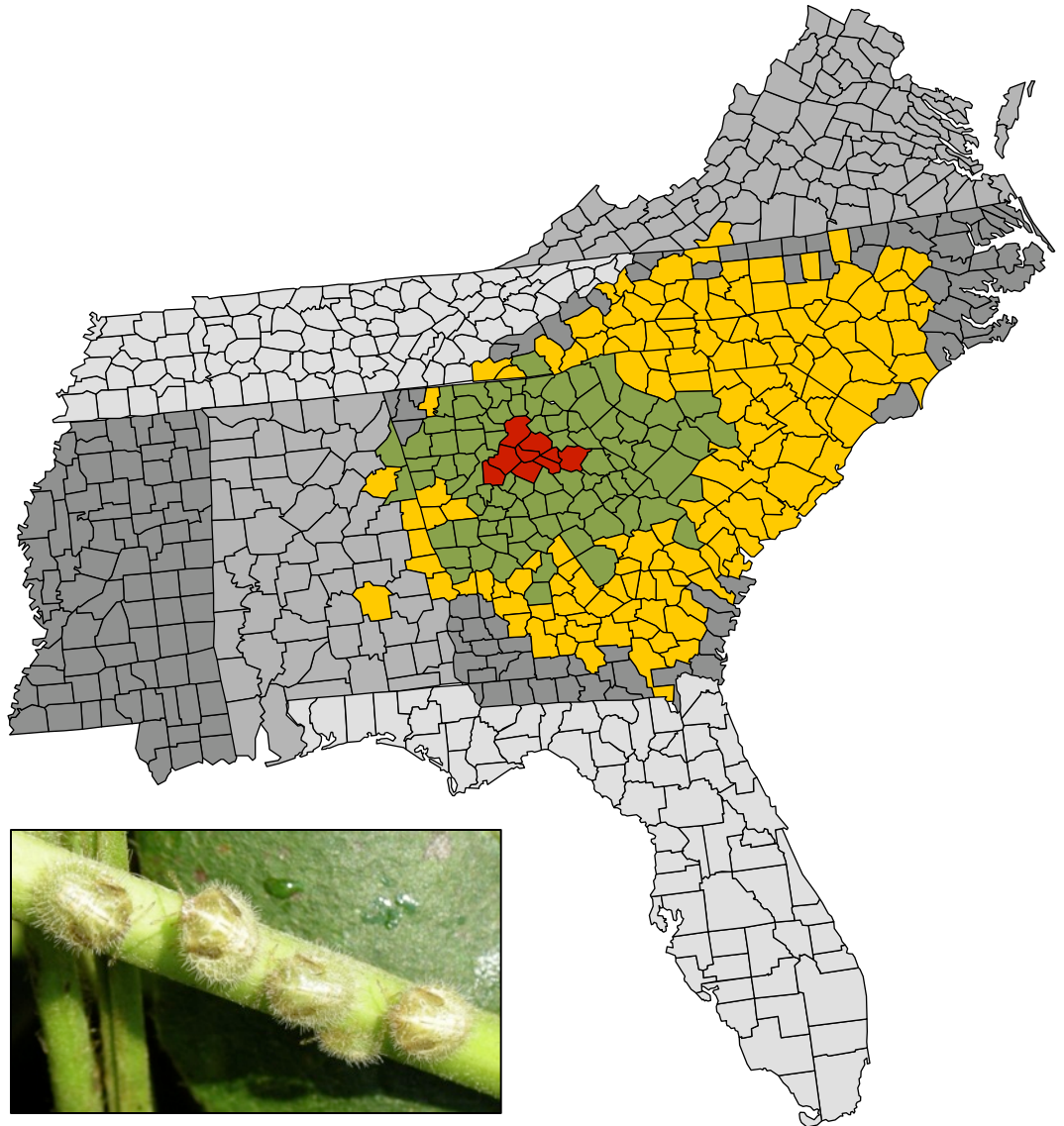
Photographs courtesy of Daniel R. Suiter, University of Georgia, College of Agriculture & Environmental Sciences



Feb 9, 2011

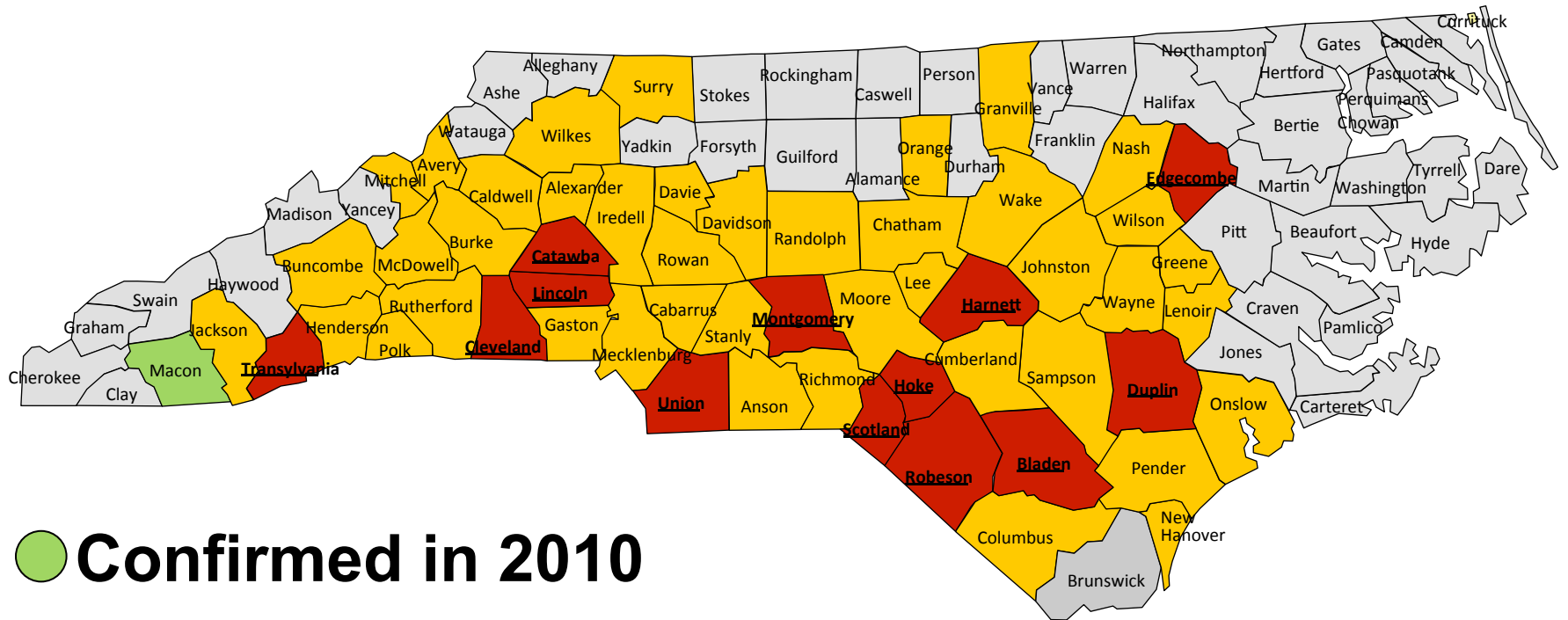
Megacopta cribraria (kudzu bug) occurrence in the Southeastern United States

- Confirmed in 2009
- Confirmed in 2010
- Confirmed in 2011



Distribution map courtesy of W. Gardner, Univ. of Georgia
Images by J. Greene, Clemson Univ.

Kudzu bug in North Carolina, 2010-2011

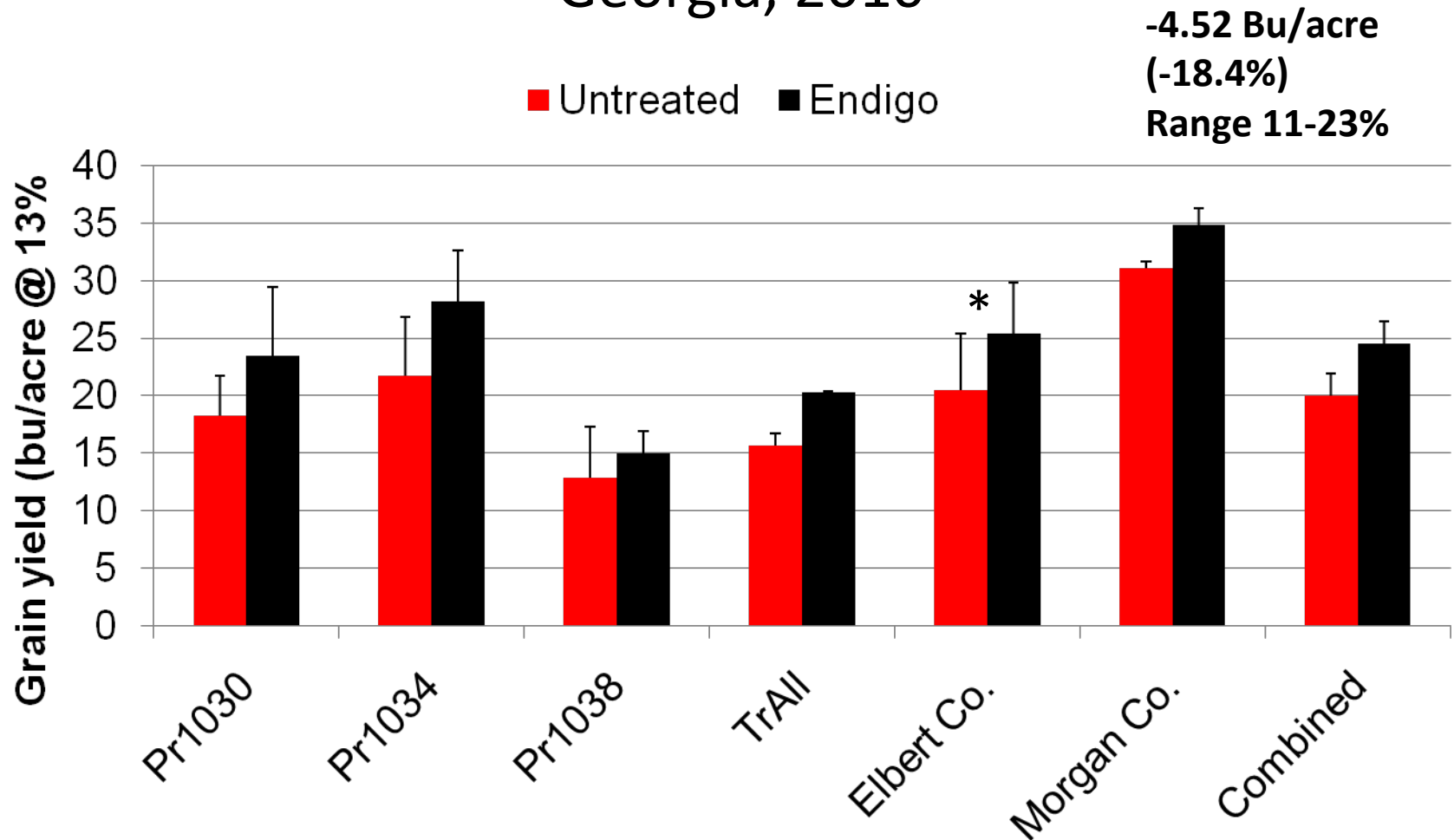


● Confirmed in 2010

● Confirmed in 2011

● Confirmed in soybean in 2011

Soybean grain yield in untreated and season-long control of *M. cribraria* using Endigo insecticide in 6 trials in Georgia, 2010



* Means significantly different, *F* test, $\alpha = 0.05$

Questions?

