

2013 LOUISIANA AGRICULTURAL TECHNOLOGY & MANAGEMENT CONFERENCE  
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## Update on Soybean Insects and Acephate Resistance

**Dr. Jeff Davis**

Soybean Research Entomologist

**Department of Entomology**

**Louisiana State University Agricultural Center**

*Proxys punctulatus*



# SOYBEAN

*Weed, Insect and Disease*

*Field Guide*



*Funded by the*  
Louisiana Soybean and Grain Research & Promotion Board

# INSECTS



Soybean Insects  
[www.LSUAgCenter.com/soybeans/insects](http://www.LSUAgCenter.com/soybeans/insects)

[http://www.lsuagcenter.com/en/crops\\_livestock/crops/soybeans/Publications/Soybean-Weed-Insect-and-Disease-Field-Guide.htm](http://www.lsuagcenter.com/en/crops_livestock/crops/soybeans/Publications/Soybean-Weed-Insect-and-Disease-Field-Guide.htm)



# Mid-South Soybean Stink Bug Pest Complex



*Nezara viridula*



*Acrosternum hilare*



*Euschistus servus*



Russ Ottens, University of Georgia, Bugwood.org

# That red stink bug...



**Redbanded Stink Bug**



**Red Shouldered Stink Bug**



✓ **Common name:**  
redbanded stink bug

✓ **Scientific name:**  
*Piezodorus guildinii*  
(Westwood)

✓ **Most damaging stink bug**  
Physical damage  
Chemical damage



K. Kamminga 2009

R5 to R8

0 stink bugs/25 sweeps

3 stink bugs/25 sweeps



MACON RIDGE 2011



BEN HUR 2011

Action Threshold = 6 per 25 sweeps for redbanded stink bug



✓ **Common name:**  
redbanded stink bug

✓ **Scientific name:**  
*Piezodorus guildinii*  
(Westwood)

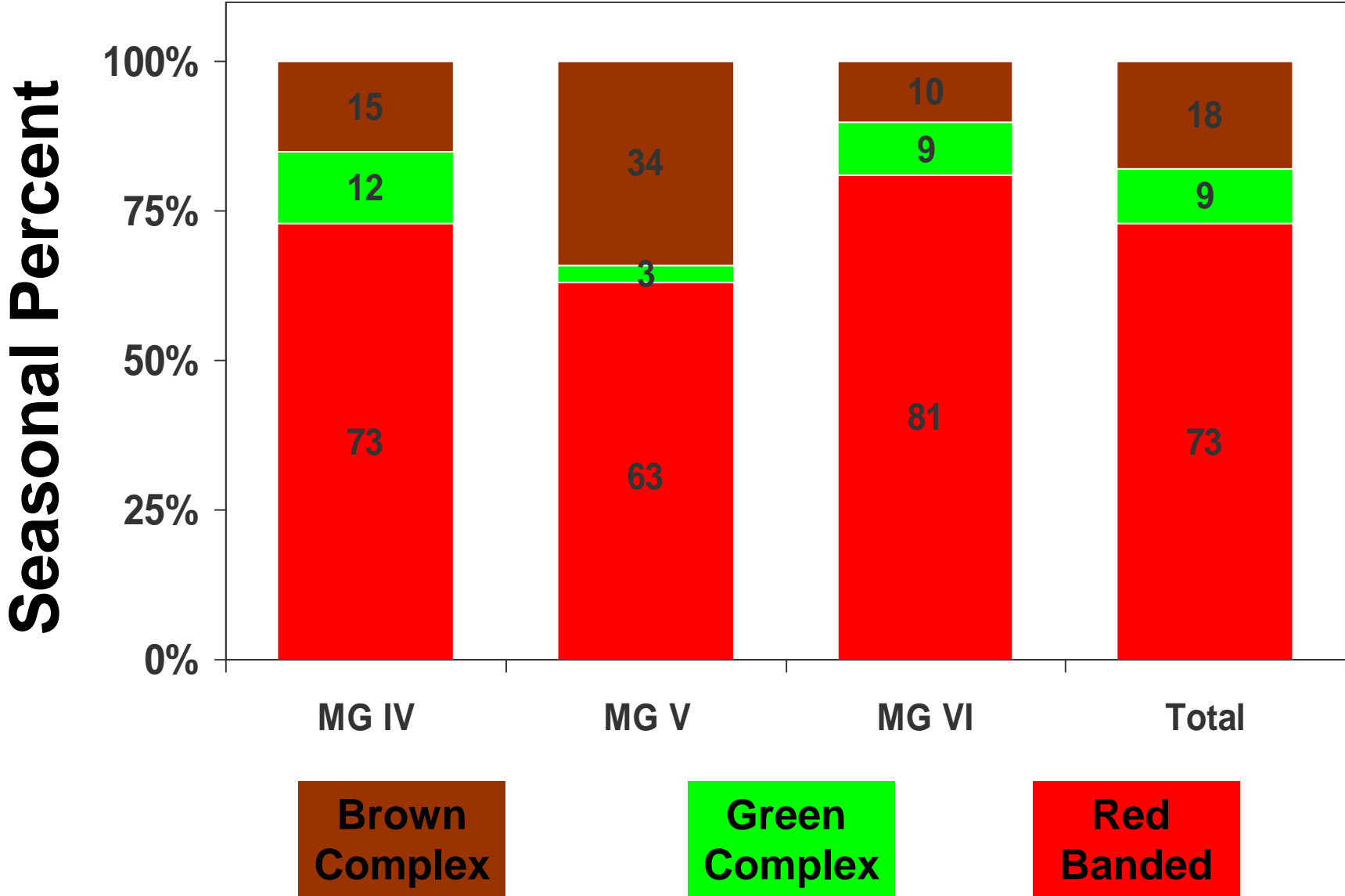
✓ **Most damaging stink bug**  
Physical damage  
Chemical damage

✓ **Most numerous stink bug  
in LA and TX soybean**  
> 50% of stink bugs  
caught in soybean



K. Kamminga 2009

# LA Stink Bug Abundance





# Redbanded Stink Bug Status 2009 to 2012

Weekly samples from  
late May – early October

## Red River Sta

2009: 848  
2010: 118  
2011: 3  
2012: 82

## Macon Ridge Sta

2009: 433  
2010: 17  
2011: 6  
2012: 290

## Dean Lee Sta

2009: 791  
2010: 311  
2011: 90  
2012: 648

★ Cold temperatures  
★ Drought

## Ben Hur Sta

2009: 409  
2010: 23  
2011: 526  
2012: 153

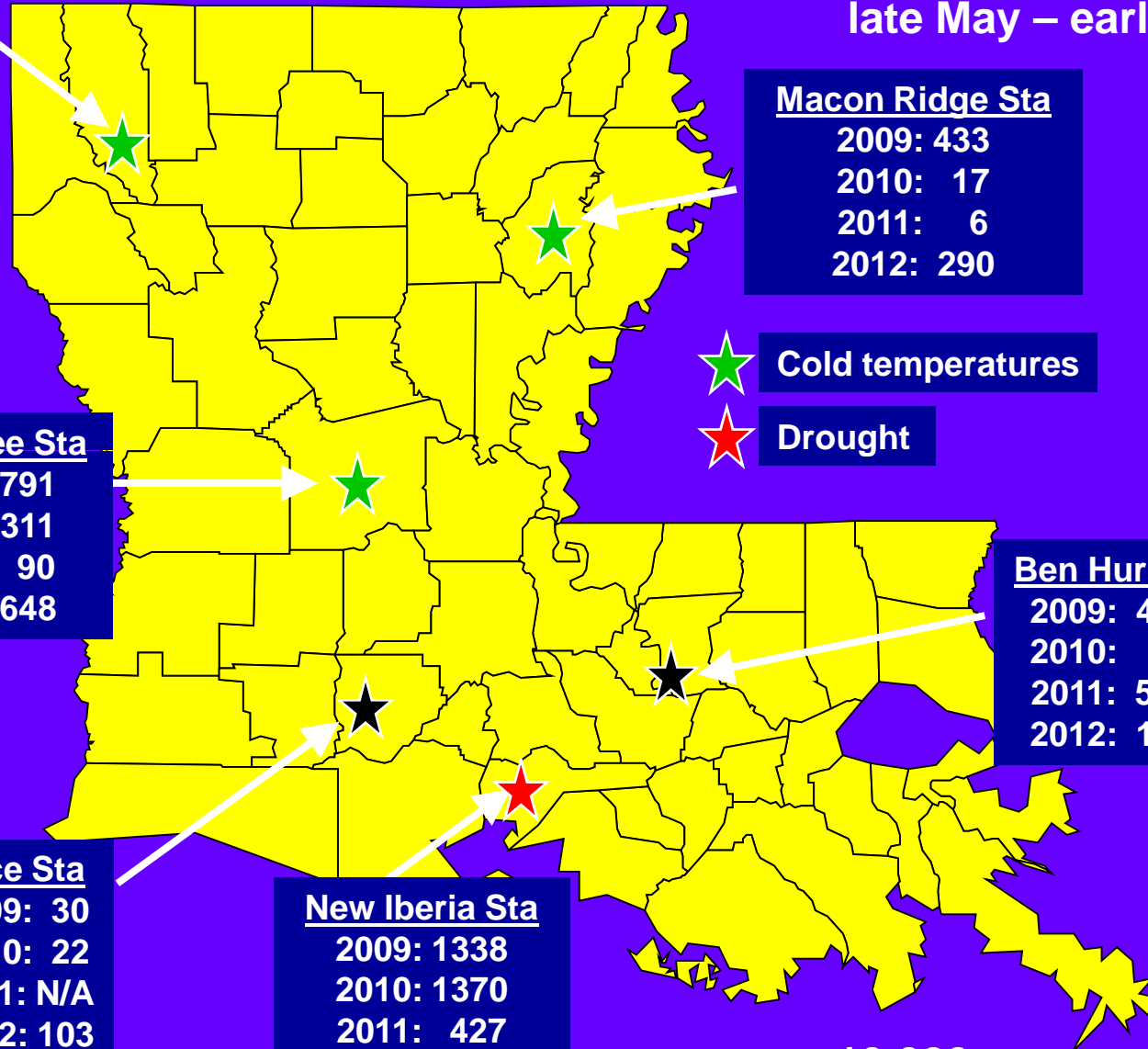
## Rice Sta

2009: 30  
2010: 22  
2011: N/A  
2012: 103

## New Iberia Sta

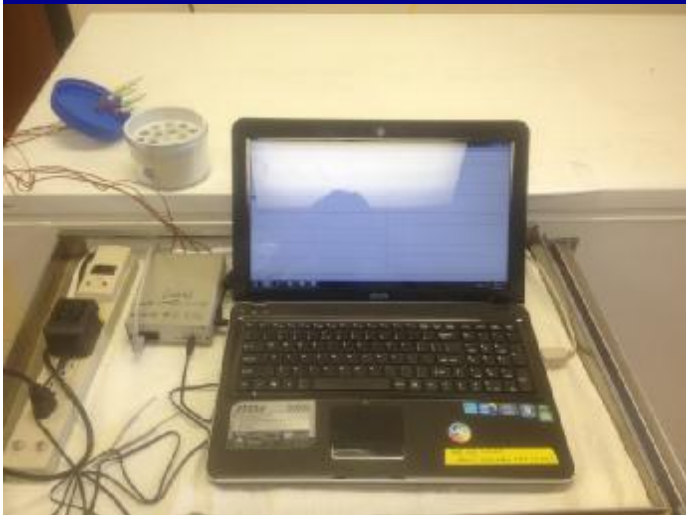
2009: 1338  
2010: 1370  
2011: 427  
2012: 510

10,000 sweeps per location



## Determine upper and lower developmental thresholds and supercooling points for redbanded stink bug

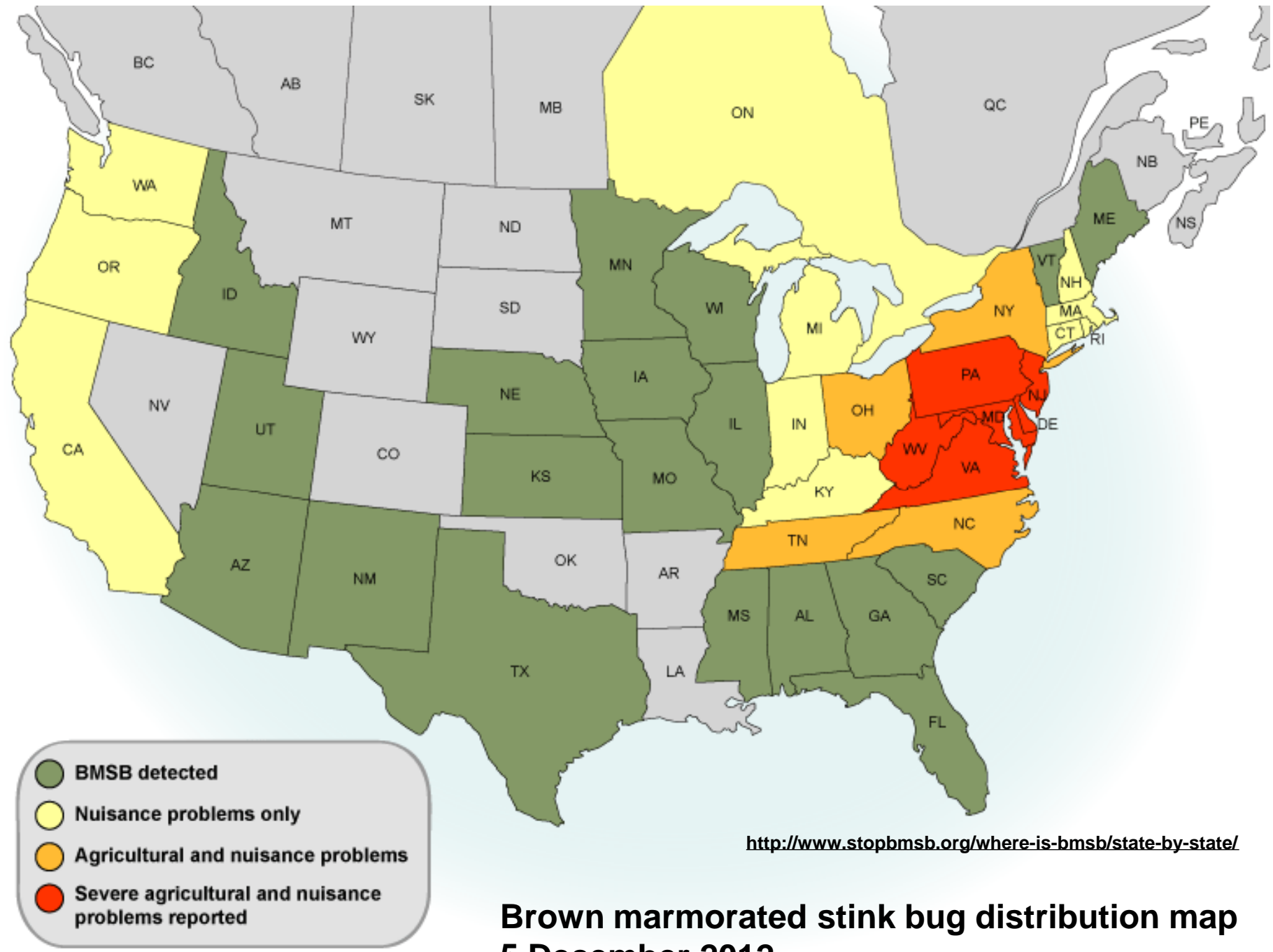
- ✓ Redbanded stink bug supercooling point is  $-4^{\circ}\text{F}$
- ✓ When exposed to  $23^{\circ}\text{F}$  for 24 hr, 75% mortality occurred
- ✓ At  $32^{\circ}\text{F}$ , redbanded stink bug had to be exposed for a week to see 95% mortality





# Brown marmorated stink bug (*Halyomorpha halys* Stahl)





**Brown marmorated stink bug distribution map  
5 December 2012**



# LOUISIANA RECOMMENDATIONS FOR CONTROL OF INSECTS ON SOYBEANS

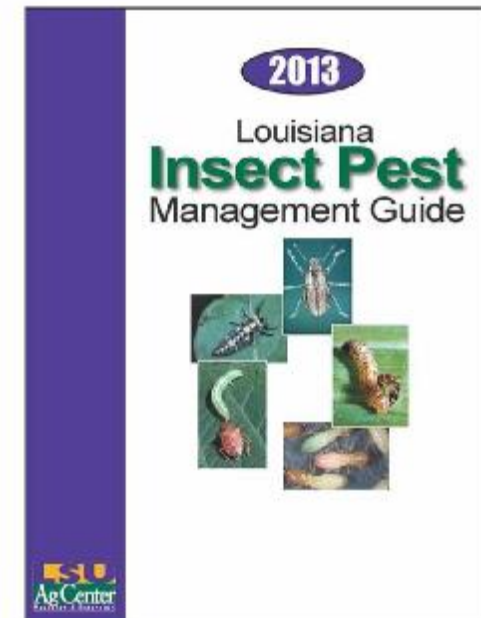
Insect	Insecticide
Redbanded stink bug <sup>4</sup>	<CONTROL>
	Orthene (Acephate)
	Endigo ZC
	Brigade (2)
	Hero (1.24)
	Leverage 360
	<SUPPRESSION>
Cyfluthrin (2)	



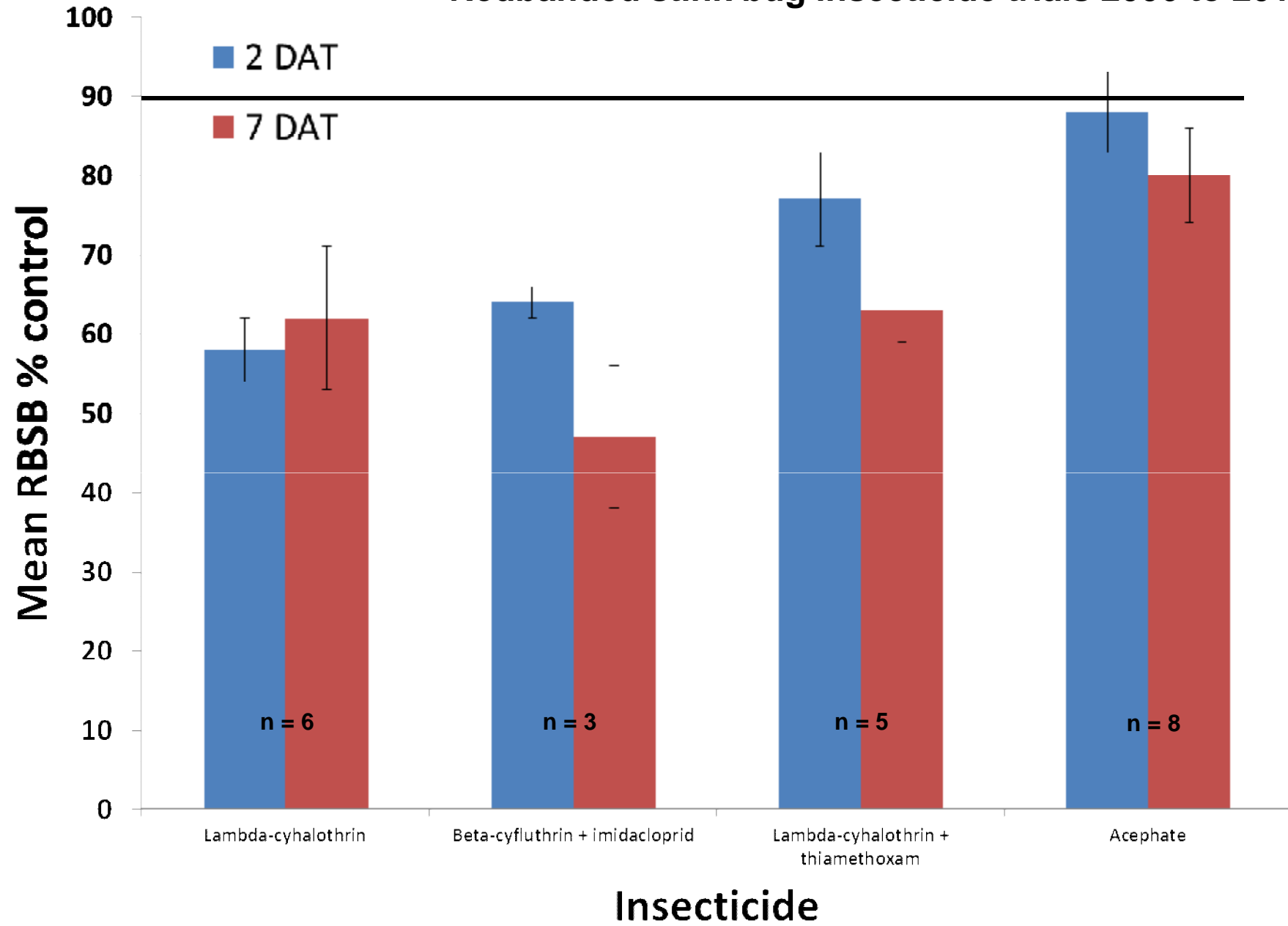
## When to Treat (Economic threshold)

~~Treat for 24 bugs in 100 sweeps.~~

**Treat when you reach 16 bugs in 100 sweeps**



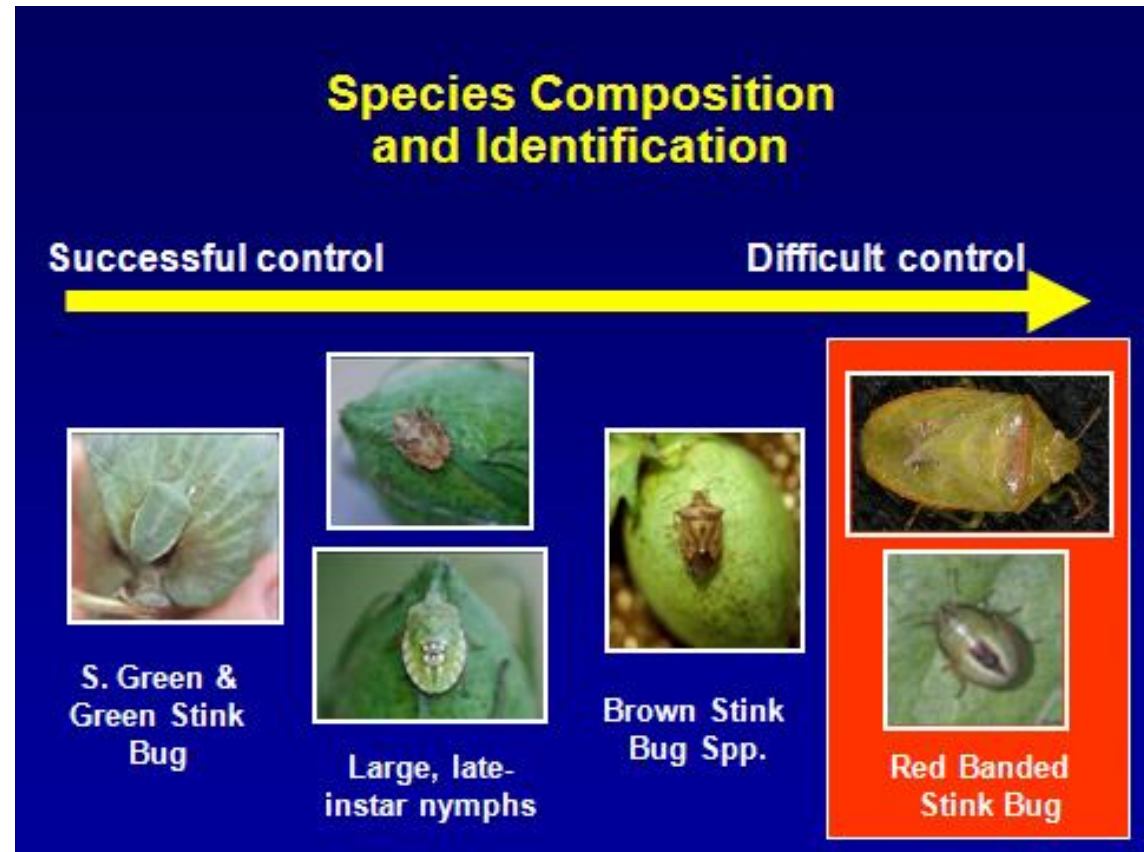
# Redbanded stink bug insecticide trials 2006 to 2012





# Controlling Stink Bugs: Insecticides

- Stink bugs can be difficult to control
  - Multiple insecticide applications
  - Concerns about resistance management





## Arthropod Pesticide Resistance Database

[Welcome](#)[Search](#)[IRAC](#)[Login](#)[Sign Up](#)[Contact](#)

### Welcome



Welcome to the Arthropod Pesticide Resistance Database (APRD). This website serves as a gateway to access the database. Anyone can [Search](#) the database, but only authorized user can submit a case to the database. If you want to submit a case, you must [Login](#) to the system first. If you do not have an account, please feel free to [Apply Online](#).

### Brief Introduction

We publish this data on the internet as a public service, for use by resistance management practitioners around the world. We encourage researchers to contact us with any resistance information they might have. Contact us if you have any difficulties with these pages, or with comments and suggestions.

This is a database of reports of resistance cases from 1914 to the present, when the resistance is first discovered for a specific time and place. Pesticide resistance is a dynamic, evolutionary phenomena and a record in this database may or may not be indicative of your area. Similarly, the absence of a record in this database does not indicate absence of resistance.

This database was made possible by grants from the US Department of Agriculture, [CSREES Pest Management Alternatives Program](#), the Insecticide Resistance Action Committee ([IRAC](#)), and Generating Research and Extension to meet Economic and Environmental Needs ([GREEN](#)) Project # GR02-69, Michigan Agricultural Experiment Station ([MAES](#)), Michigan State University Extension ([MSUE](#)) and the Michigan Department of Agriculture ([MDA](#)).

<http://www.pesticideresistance.org>



## nezara viridula

### Profile

Order	Family	Common Name(s)	Group	Host
hemiptera	pentatomidae	southern green stinkbug	AG	cotton

### Shown Resistance to Active Ingredient(s)

1. [DDT](#)

### Citation(s) of Resistance

#	Citation
1	Hooper, G. H. S. (1968). A review of the problem of insecticide resistance in Australia.. <i>J. Aust. Entomol. Soc.</i> , 7 67-76.

### Location(s) Where Resistance is Reported

#	Location
1	7 -- Australia



# Redbanded stink bug acephate resistance monitoring

**% Mortality at LC50 for methamidophos**



<b>Collection</b>	<b>%</b>
LA1	32*
LA2	47
LA3	79
LA4	85
LA5	44
LA6	53
LA7	55
LA8	10*

# Stink Bug Insecticide Resistance Management

- ✓ Spray only when necessary
  - Action Thresholds
- ✓ Use labeled rates
- ✓ Rotate chemistries/modes of action
  - Acephate = 1B
  - Pyrethroids = 3A
  - Neonicotinoids = 4A

# Why conserve natural enemies?

## Stink Bug Egg Parasitoids

- 20 to 54% of individual eggs parasitized
- 26 to 68% of egg masses parasitized
- Can significantly impact populations





# Why conserve natural enemies?

## Fire Ants

- Prior to insecticide applications, fire ants were avg. 100 per plot
- After insecticide applications were applied, fire ants were reduced to zero
- This coincided with a flaring of velvetbean caterpillar and soybean looper



© 2008 Mario David Bazan

✓ Lepidopteran  
Defoliators





## Insecticide Control Options

Belt  
Intrepid  
Larvin  
Steward  
Tracer  
Prevathon

## Soybean Looper Thresholds

150 per 100 sweeps  
Defoliation should not exceed 20% (R1-R5)

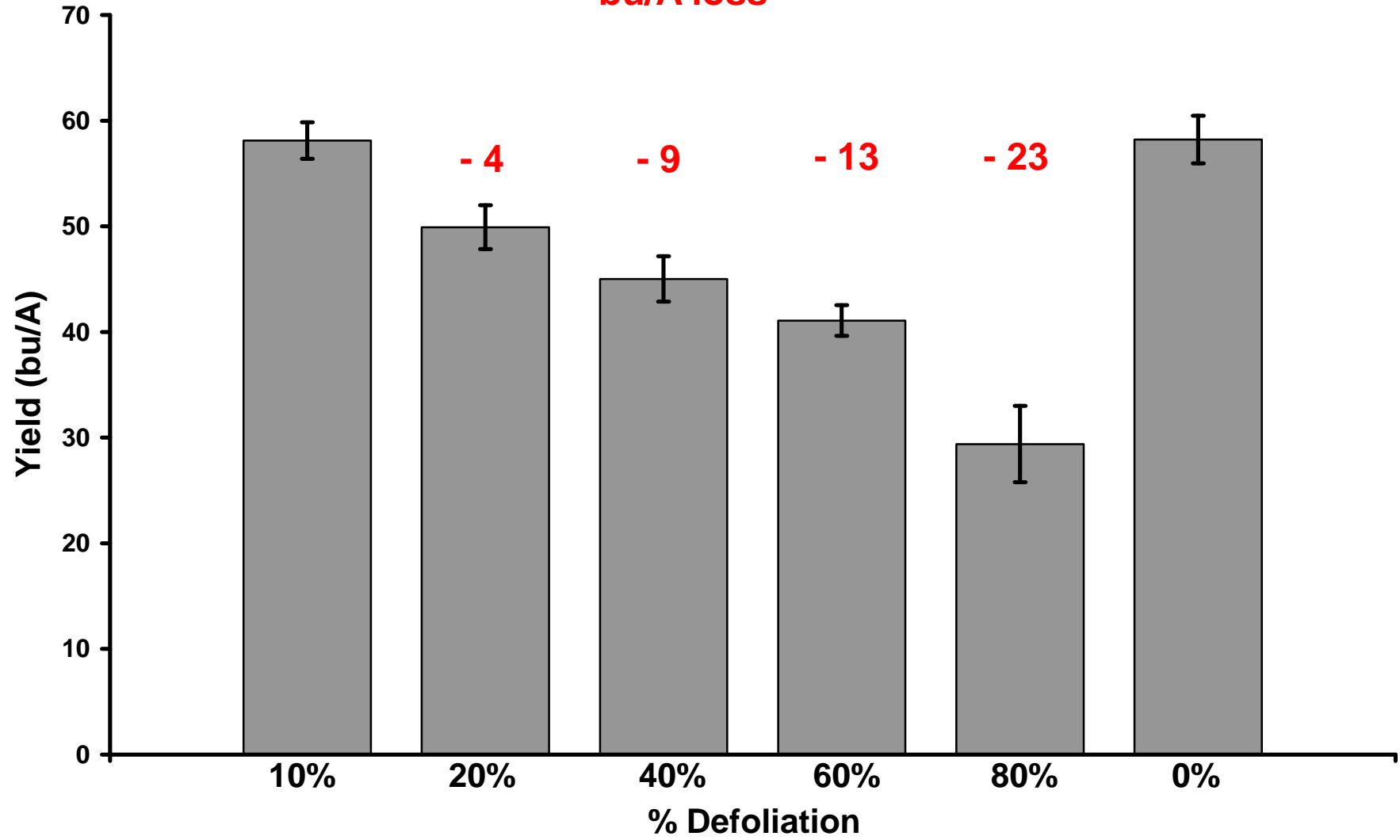
**Non-treated**





# Yield loss due to VBC and SBL

**bu/A loss**



**How much defoliation occurs after application and before worm death?**



<b>Treatment/ Formulation</b>	<b>Rate oz/A</b>	<b>% Defoliation</b>
Belt	2.0	7
Belt	3.0	3
Coragen	5.0	6
Coragen	7.5	2
Intrepid	4.0	22
Intrepid	8.0	19
Steward	4.6	7
Steward	11.3	7
Tracer	1.0	28
Tracer	2.0	15
Larvin	18.0	57
Larvin	30.0	22

## Monitoring for Soybean Looper Insecticide Resistance

SBL Colony	% Mortality at LC95 for each product			
	Belt	Steward	Intrepid	UTC
DL2012	98	6*	78*	0
NI2012	100	69*	98	0
SJ2012	100	47*	87*	1

**Key Point: Soybean looper populations that arrive in Louisiana can be resistant to Steward and Intrepid**



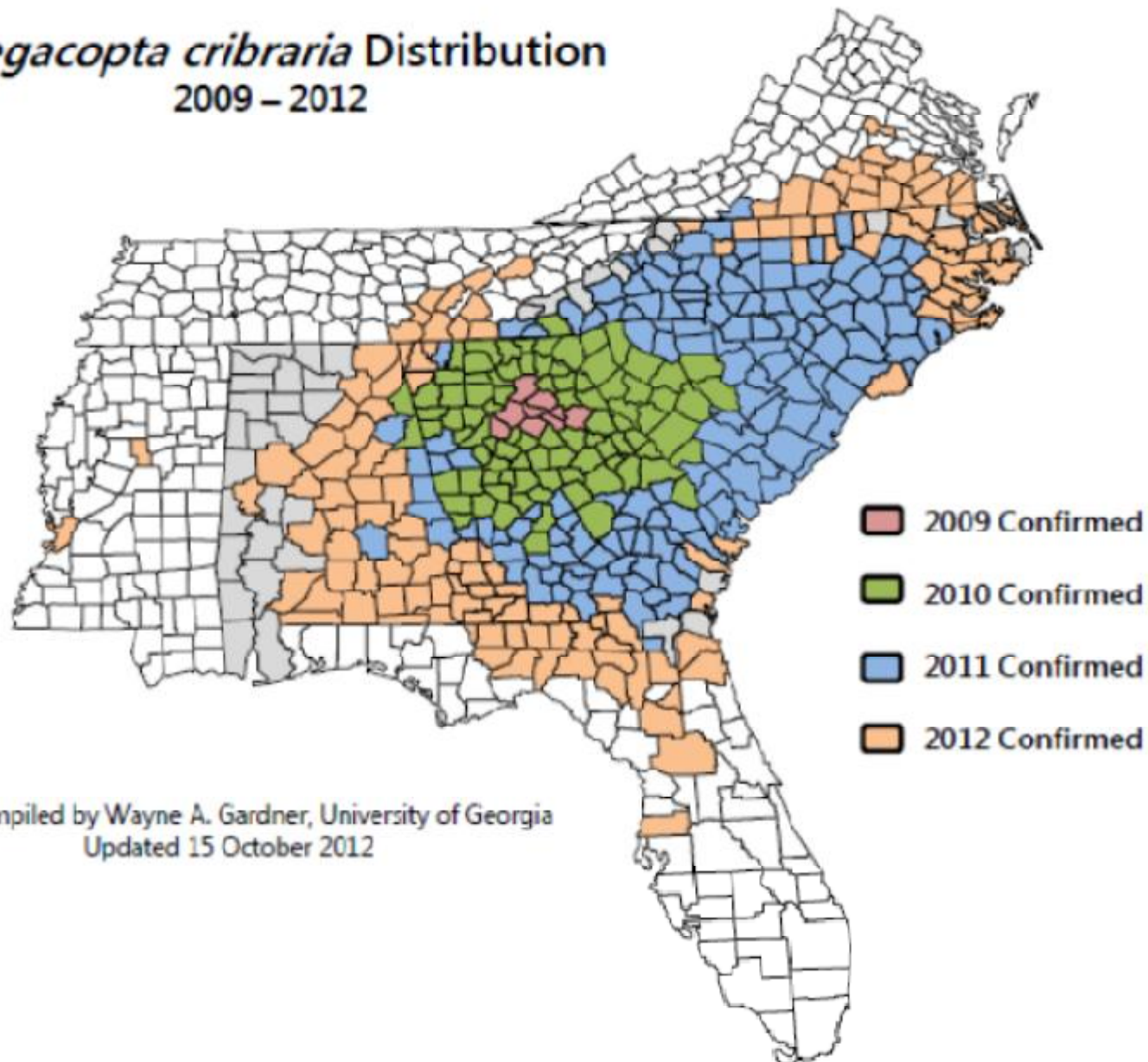
Kudzu Bug





# Current Kudzu Bug Distribution

*Megacopta cribraria* Distribution  
2009 – 2012



Map compiled by Wayne A. Gardner, University of Georgia  
Updated 15 October 2012



J. Greene 2010  
Clemson University



University of Georgia

P. Roberts, J. All, D. Buntin, W. Gardner, John Ruberson, M. Toews, D. Suiter, and T. Jenkins

Clemson University

J. Greene, N. Seiter, and F. Reay-Jones

USDA---NBCL

W. Jones

# Yield Loss in Soybeans

Georgia and South Carolina, n=19

Year	State	% Yield Reduction	Maturity Group	Test Type
2010	GA	11%	MGVII	Trt vs Unt
2010	GA	19%	MGVII	Trt vs Unt
2010	GA	23%	MGVII	Efficacy
2010	GA	23%	MGVII	Efficacy
2010	GA	14%	MGVII	Efficacy
2010	GA	22%	MGVII	Efficacy

Year	State	% Yield Reduction	Maturity Group	Test Type
2011	SC	0%	MGIV	Threshold
2011	SC	10%	MGVII	Threshold
2011	GA	27%	MGV	Threshold
2011	SC	14%	MGVIII	Pheno
2011	SC	12%	MGVII	Pheno
2011	GA	47%	MGV	Pheno
2011	GA	36%	MGV	Efficacy
2011	SC	20%	MGVII	Efficacy
2011	SC	25%	MGVII	Efficacy
2011	GA	30%	MGVII	Efficacy
2011	GA	0%	MGVII	Efficacy
2011	GA	13%	MGVII	Efficacy
2011	GA	0%	MGVII	Efficacy

**18% AVG**

**Range: 0%-47%**

## Kudzu Bug Insecticides

Insecticide	(n)	Mean % Control (2-5 DAT)
Hero	1	96
<b>Brigade</b>	<b>4</b>	<b>95</b>
Karate+Orthene	1	94
<b>Endigo</b>	<b>9</b>	<b>92</b>
<b>Brigadier</b>	<b>2</b>	<b>91</b>
Discipline	3	90
Sevin	3	90
Karate	8	89
Declare	3	85
dimethoate	1	84
<b>Cobalt</b>	<b>6</b>	<b>82</b>
<b>Mustang Max</b>	<b>4</b>	<b>81</b>
<b>Orthene</b>	<b>5</b>	<b>81</b>

- **Threshold (preliminary):**
  - Treatment should be initiated when nymphs exceed one per sweep.

# Thank You

Questions?

Email: [jeffdavis@agcenter.lsu.edu](mailto:jeffdavis@agcenter.lsu.edu)

Phone:

225-578-5618

## ACKNOWLEDGEMENTS:

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