

IPM Updates for 2014

Scott Stewart

Entomology and Plant Pathology

UT Extension

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Relatively New Insecticides (or new uses)

- ▶ Transform
- ▶ Radiant
- ▶ Intrepid Edge
- ▶ Besiege

- ▶ Triple Crown
- ▶ DoubleTake
- ▶ Stallion

Transform WG

- ▶ Dow AgroSciences
- ▶ Sulfoxaflor (50% WG)
- ▶ Cotton
 - ▶ Tarnished plant bugs (1.5 - 2.25 oz/acre)
 - ▶ Aphids (0.75 - 1.0 oz/acre)
- ▶ Soybean
 - ▶ Not much fit except for aphids



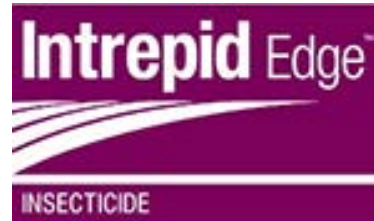
Radiant SC



- ▶ Dow AgroSciences
- ▶ Spinetoram (1 lb ai/gal)
- ▶ Mostly labeled for caterpillar pests in multiple crops including corn, cotton, soybean, and cereal grains
 - ▶ Typical use rate of 2 - 5 oz/acre
- ▶ Also labeled for control of thrips
 - ▶ Cotton (1.5 - 3 oz/acre)
 - ▶ Adjuvant needed
 - ▶ Good choice for western flower thrips



Intrepid Edge



- ▶ Dow AgroSciences
- ▶ Premix
 - ▶ Combination of spinetoram (Radiant) and methoxyfenozide (Intrepid)
- ▶ Labeled for multiple caterpillar pests in cotton, soybean, and peanut
 - ▶ Typical use rate of 4 - 6 oz/acre
 - ▶ Primary use will be in soybean

Besiege

- ▶ Syngenta
- ▶ Premix
 - ▶ L-cyhalothrin (Karate) and chlorantraniliprole (≈ Prevathon)
- ▶ Labeled for multiple caterpillar pests in cotton, soybean, corn, pasture, and expecting sorghum by 2014
- ▶ Mostly for caterpillar pests
 - ▶ Typical use rate is 6 - 10 oz/acre
 - ▶ Primary use will be in soybean or sorghum
 - ▶ Diamide component (chlorantraniliprole) provides long residual control

A few others ... but nothing exciting

▶ FMC

▶ Triple Crown

- ▶ Premix of z-cypermethrin (Mustang Max), bifenthrin (Brigade), and imidacloprid
- ▶ Cotton and soybean (see label for rates)

▶ Stallion

- ▶ Premix of chlorpyrifos (Lorsban) and Z-cypermethrin (Mustang Max)
- ▶ Corn, cotton, sorghum, soybean (see label for rates)

▶ Chemtura

▶ DoubleTake

- ▶ Premix of bifenthrin (Brigade) and diflubenzuron (Dimilin)
- ▶ Cotton and soybean (2 - 4 oz/acre)

Insecticide Performance Charts

(PB 1768, 2014 Insect Control Recommendations for Field Crops)

► Cotton, Soybean, Corn, Sorghum, Wheat

Field Corn Insecticide Performance Ratings

| Insecticide | REI (hours) | Restricted Use (R) | Chinch Bug | Corn earworm, Fall army. | Cutworm | European Corn Borer | Flea Beetle | Grasshopper | Southwestern Corn Borer | Green Stink Bug | Brown Stink Bug |
|-----------------|-------------|--------------------|------------|--------------------------|---------|---------------------|-------------|-------------|-------------------------|-----------------|-----------------|
| Ambush / Pounce | 12 | X | 7 | 5 | 8 | 6 | | 7 | 5 | 4 | 3 |
| Asana XL | 12 | X | 7 | 6 | 8 | 6 | | 7 | 6 | 8 | 4 |
| Baythroid XL | 12 | X | 7 | 6 | 8 | 6 | 6 | 8 | 6 | 8 | 4 |
| Belt | 12 | | 0 | 8 | 8? | 8 | | | 8 | 0 | 0 |
| Besiege | 24 | X | 7? | 9 | 8? | 9 | 6 | 8 | 9 | 8 | 4 |
| Brigade | 12 | X | 7 | 6 | 8 | 7 | 6 | 8 | 7 | 8 | 7 |
| Cobalt | 24 | X | 7 | 7 | 8 | 7 | 6 | 8 | 7 | 8 | 5 |
| Declare | 24 | X | 7 | 6 | 8 | 6 | 6 | 8 | 6 | 8 | 4 |
| Hero | 12 | X | 7 | 6 | 8 | 7 | 6 | 8 | 7 | 8 | 7 |
| Intrepid | 4 | | 0 | 3 | 7? | 8 | | 0 | 8 | 0 | 0 |
| Karate | 24 | X | 7 | 6 | 8 | 6 | 6 | 8 | 6 | 8 | 4 |
| Lannate | 48 | X | 3 | 7 | 5 | 1 | | 4 | 1 | 5 | 5 |
| Lorsban | 24 | X | 7 | 4 | 7 | 5 | | 6 | 5 | 4 | 4 |
| Malathion | 12 | | 1 | 2 | 0 | 1 | | 5 | 1 | 7 | 7 |
| Mustang Max | 12 | X | 7 | 6 | 8 | 6 | 6 | 8 | 6 | 8 | 4 |
| Prevathon | 4 | | 0 | 9 | 8? | 9 | | | 9 | 0 | 0 |
| Sevin | 12 | X | 3 | 4 | 5 | 2 | 8 | 5 | 2 | 4 | 4 |
| Tracer | 4 | | 0 | 7 | 7 | 5 | 0 | 1 | 6 | 0 | 0 |

Rating Scale: 0 = no control, 10 = excellent.

Thiamethoxam is ...

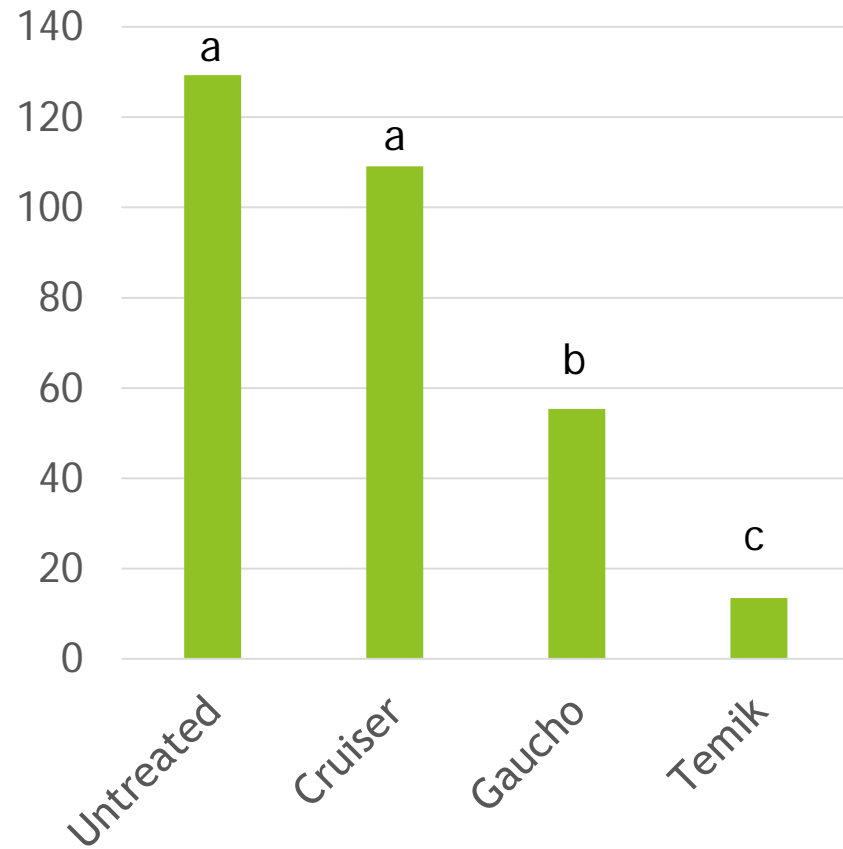
- ▶ The active ingredient of Centric, a foliar insecticide used in cotton
 - ▶ It is also a component of Endigo
- ▶ It is also an insecticide seed treatment used in multiple crops including cotton, soybean, corn and wheat
 - ▶ Cruiser, Cruiser Maxx, Avicta Complete
 - ▶ Acceleron N

Cruiser Resistance

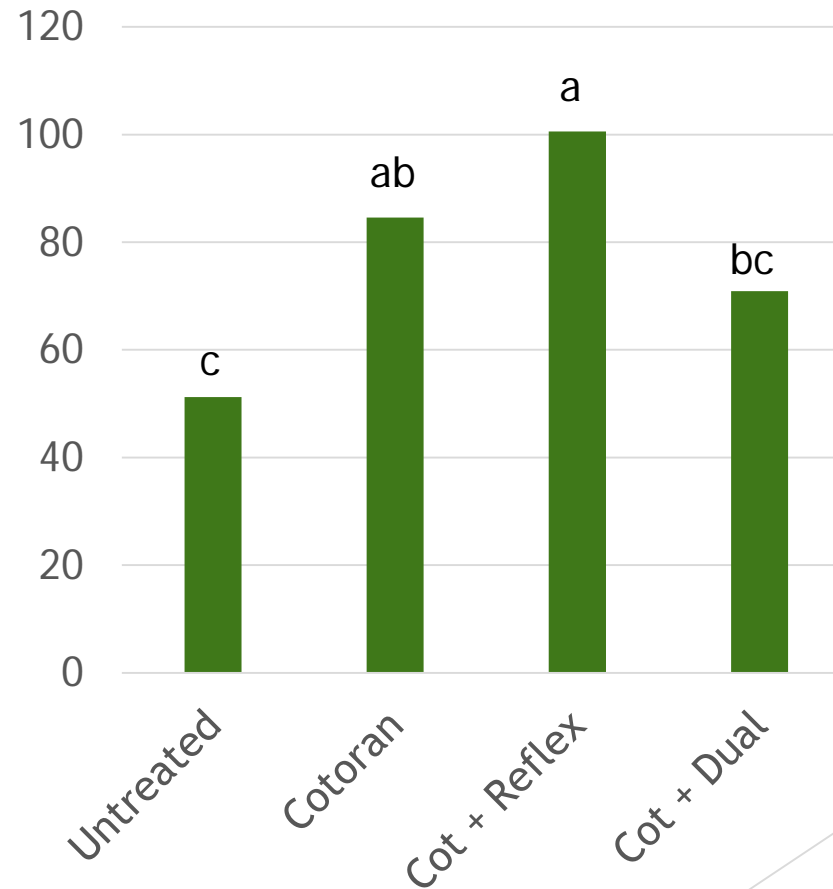
- ▶ Reported resistance to thiamethoxam seed treatments in populations of tobacco thrips in the Mid South
- ▶ Field control failures observed in last 2-3 years with Cruiser seed treatment in cotton
- ▶ Some indication that imidacloprid may also be affected

Immature Thrips (8 Plants, 24 DAP)

Insecticide (P = 0.0003, LSD = 38.1)



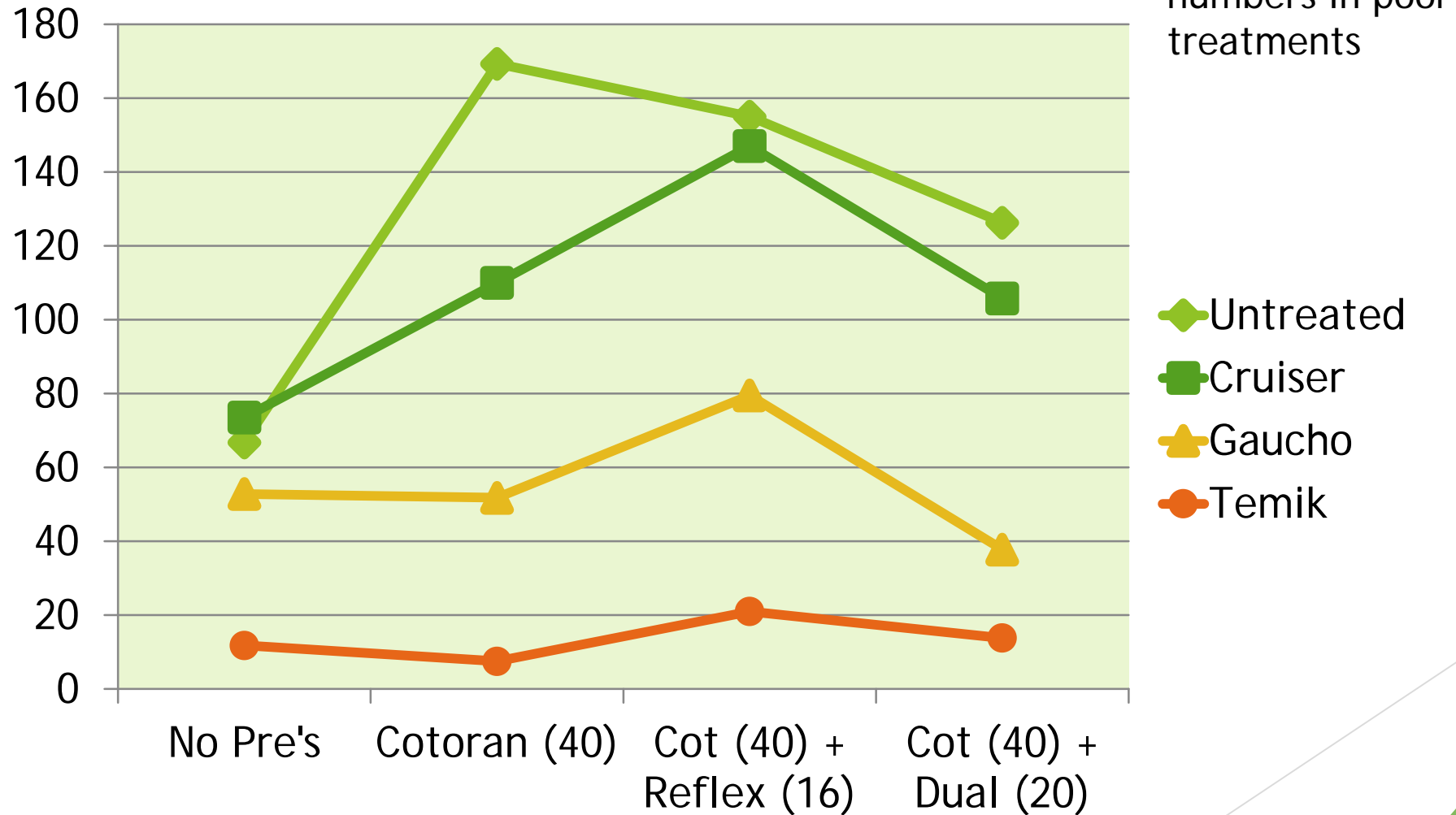
Herbicide (P = 0.0042, LSD = 22.1)



P(I x H Interaction) = 0.0535

Immature Thrips in Cotton

24 DAP



Take Home Message for 2014

- ▶ Anticipate that Cruiser (thiamethoxam) will not provide adequate control of thrips in the Mid South
 - ▶ Resistance appears likely and spreading
 - ▶ Imidacloprid may or may not be affected
 - ▶ Injury from pre- or post-emergence herbicides may compound the effects of thrips injury
- ▶ Use alternative thrips control strategies in cotton
 - ▶ Temik is not an available
 - ▶ Imidacloprid based seed treatments
 - ▶ Acephate IST or in-furrow spray
 - ▶ If using thiamethoxam, treat proactively with foliar insecticides as though the seed is not treated
 - ▶ Supplement with acephate IST or in-furrow spray

Cotton Seed Treatments (company offerings)

| Delta Pine (Monsanto) | | | Phytogen (Dow) | | | Stoneville, FiberMax (Bayer) | | |
|-----------------------|--------------------|--------------------|----------------|-----------------|-----------------|------------------------------|-------------------------|------------------------|
| Acceleron I | Acceleron FI | Acceleron N | Cruiser | Cruiser Dynasty | Avicta Complete | Aeris | Aeris + Trilex Advanced | + Poncho/Votivo |
| Imidacloprid | Imidacloprid | Thiamethoxam | Thiamethoxam | Imidacloprid | Imidacloprid | Imidacloprid | Imidacloprid | Clothianidin |
| Pyraclostrobin* 2X | Pyraclostrobin* 2X | Pyraclostrobin* 2X | Fludioxonil | Fludioxonil | Fludioxonil | Triadimenol* | Trifloxystrobin | <i>Bacillus firmus</i> |
| Metalaxyl* | Metalaxyl* | Metalaxyl* | Mefenoxam* | Fludioxonil | Fludioxonil | Metalaxyl* | Triadimenol | |
| Myclobutanil* | Myclobutanil* | Myclobutanil* | Myclobutanil* | Mefenoxam | Mefenoxam | Ipconazole* | Metalaxyl | |
| Fluxapyroxad* | Fluxapyroxad* | Fluxapyroxad* | TCMTB* | Myclobutanil | Myclobutanil | Thiodicarb | Ipconazole | |
| | Ipconazole | Ipconazole | | TCMTB | TCMTB | | Thiodicarb | |
| | | Abamectin | | | Abamectin | | | |

Phytogen is adding an imidacloprid (Gaucho) option

INSECT
DISEASE
NEMATODE

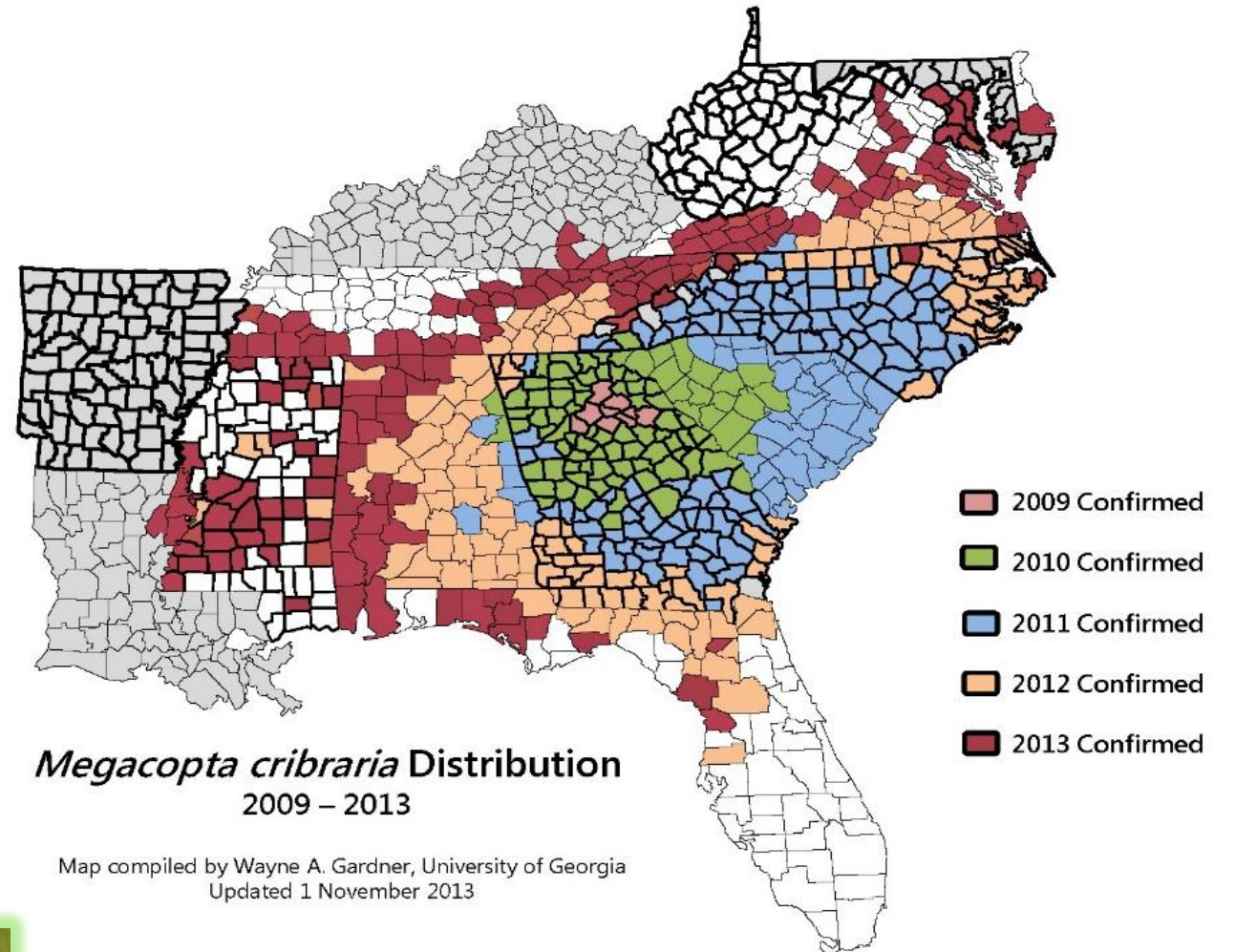
* Base fungicides if no insecticide/nematicide treatments are ordered (at 1X rates)

New Pests (Invasive Insects)

- ▶ Kudzu bug
- ▶ Brown marmorated stink bug
- ▶ Bermudagrass stem maggot
- ▶ Spotted winged drosophila

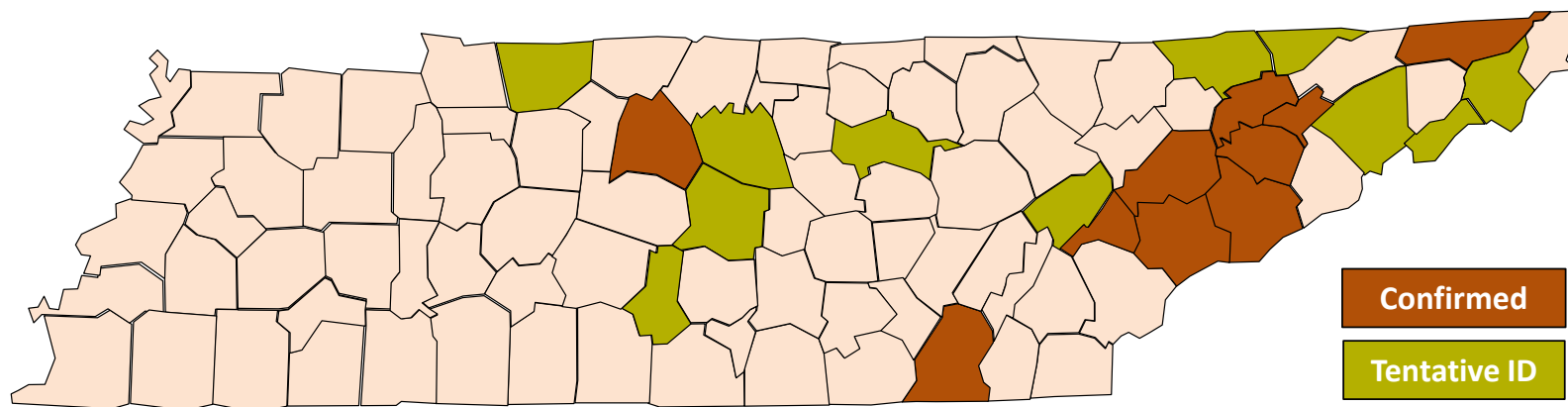
Kudzu Bug

- ▶ *Megacopta cribraria*
- ▶ Major threat to soybean
- ▶ Home invader



Brown Marmorated Stink Bug

- ▶ *Halyomorpha halys*
- ▶ Threat to multiple field, vegetable, and tree fruit crops
- ▶ Also a home invader



Revised Thresholds

- ▶ Kudzu Bugs (soybean)
- ▶ Southwestern corn borer (corn)
- ▶ Corn earworm / fall armyworm (sorghum heads)

Kudzu Bug Threshold

▶ Old

- ▶ Treat between emergence and R6 when 1 immature or 2 adults are found per sweep

▶ New

- ▶ Treat between emergence and R1 when there are 5 or more bugs per plant
 - ▶ Probably a rare event and may only require edge treatments
- ▶ Treat between R1 and R7 when 1 immature bug is present per sweep (25 immatures per 25 sweeps)



Corn Earworm / Fall Armyworm Threshold in Sorghum Heads

▶ Old

- ▶ Treat when 2 small larvae or 1 larger larvae ($> \frac{1}{2}$ inch) are found per head

▶ New

- ▶ Treat when 1 or more larvae is found per head
 - ▶ May be reducing even further in future



Southwestern Corn Borer Threshold in Non-Bt Corn

▶ Old

- ▶ Treat when 15-25% of plants are infested with larvae

▶ New

- ▶ Treat prior to tasseling when 5 percent or more of plants are found with egg masses or live larvae, or 7-10 days after pheromone traps catch an average of 50 or more moths on a 7 day catch
- ▶ Beginning at tasseling (VT) and through the milk stage (R3), treat when 10 percent or more of plants are found with egg masses or live larvae, or 7-10 days after pheromone traps catch an average of 100 or more moths on a 7 day catch
- ▶ Treatment is generally not recommended once the dough stage (R4) is reached



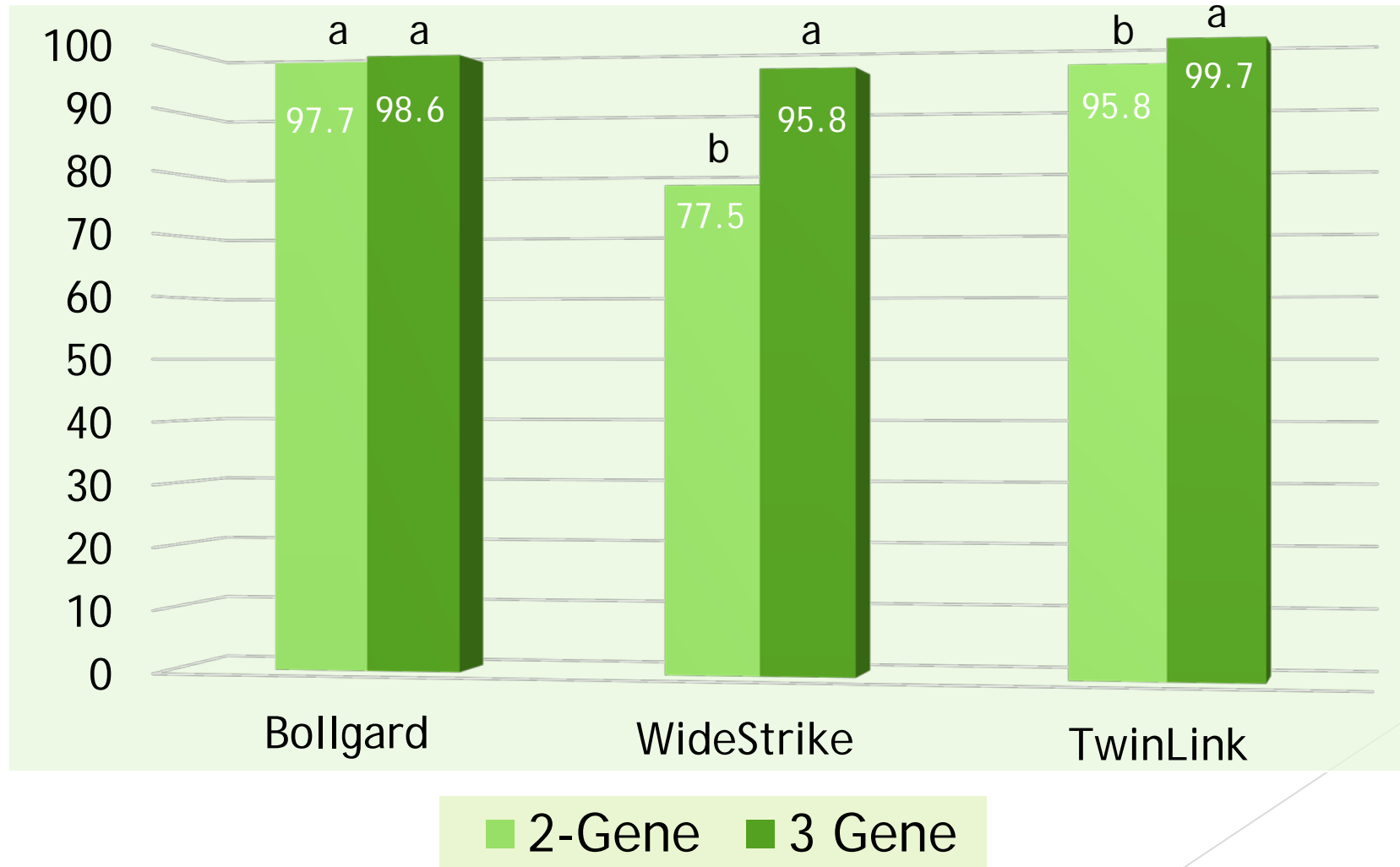
New Bt Cotton Technologies

- ▶ WideStrike 3
 - ▶ Limited release expected in 2014
 - ▶ Includes VIP3A trait
- ▶ Bollgard III and TwinLink “Advanced” are still pending (likely in 2015)
 - ▶ Also will include the VIP3A trait



% Reduction in Damaged Squares and Bolls as compared with non-Bt Cotton

(Stewart, Tennessee, 2013)



New Bt Corn Technologies

- ▶ See Handout
 - ▶ Many available Bt trait packages (old and new)
 - ▶ May or may not include Bt traits for western corn rootworm
 - ▶ In-field or immediately adjacent refuge is required if Bt rootworm traits are used
 - ▶ The size of the required refuge varies considerably depending upon the technology selected and location
 - ▶ Cotton vs. non-cotton counties
 - ▶ Refuge-in-a-bag options for non-cotton counties

Selected Bt Corn Technologies

Cotton Counties

¹ 50% and 20% non-Bt corn refuge requirement in cotton and corn areas, respectively.

² 20% non-Bt corn refuge is required in cotton and corn areas.

³ 20% and 5% refuge requirement in cotton and corn areas, respectively.

Corn Counties (not shown)

⁴ 5% refuge in bag system in non-cotton areas; 20% corn borer refuge is required in cotton growing areas.

⁵ 10% refuge in bag system in non-cotton areas; 20% corn borer refuge is required in cotton growing areas.

| Traits / Brands | Corn borers | Cutworm | Corn earworm | Fall army. | Western corn rootworm |
|--|-------------|---------|--------------|------------|-----------------------|
| Agrisure CB/LL ¹ | Excellent | Poor | Fair | Fair | None |
| Agrisure GT/CB/LL ¹ | Excellent | Poor | Fair | Fair | None |
| Agrisure 3000GT ¹ | Excellent | Poor | Fair | Fair | Good |
| Agrisure Viptera 3110 ² | Excellent | Good | Excellent | Excellent | None |
| Agrisure Viptera 3111 ² | Excellent | Good | Excellent | Excellent | Good |
| Genuity VT Triple Pro (GENVT3P) ² | Excellent | Poor | Good | Very Good | Excellent |
| Genuity VT Double Pro (GENVT2P) ³ | Excellent | Poor | Good | Very Good | None |
| Genuity SmartStax or SmartStax (GENSS or SSX) ³ | Excellent | Good | Good | Very Good | Excellent |
| Herculex I (HX1) ¹ | Excellent | Good | Poor | Good | None |
| Herculex XTRA (HXX) ¹ | Excellent | Good | Poor | Good | Excellent |
| Optimum Intrasect ³ | Excellent | Good | Fair | Very Good | None |
| Optimum Intrasect Xtra ² | Excellent | Good | Fair | Very Good | Excellent |
| Optimum Intrasect XTreme ³ | Excellent | Good | Fair | Very Good | Excellent |
| Optimum Leptra ³ | Excellent | Good | Excellent | Excellent | None |
| Optimum TRIssect ¹ | Excellent | Good | Poor | Good | Excellent |
| YieldGard Corn Borer (YGCB) ¹ | Excellent | Poor | Fair | Fair | None |
| YieldGard VT Triple (VT3) ¹ | Excellent | Poor | Fair | Fair | Excellent |

IPM Training Modules

<http://www.utcrops.com/presentations.htm>

- ▶ Virtual Soybean Scout Schools, New Agent Training, and Other Presentations
 - ▶ Soybean sampling
 - ▶ Common insect pests in soybean (injury and ID)
 - ▶ Common insect and mite pests of cotton (injury and ID)
 - ▶ Corn borers and their management
 - ▶ Weed control videos
 - ▶ Etc.