

2024 Cotton Scout School



AUBURN
Entomology

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Tools of the Trade

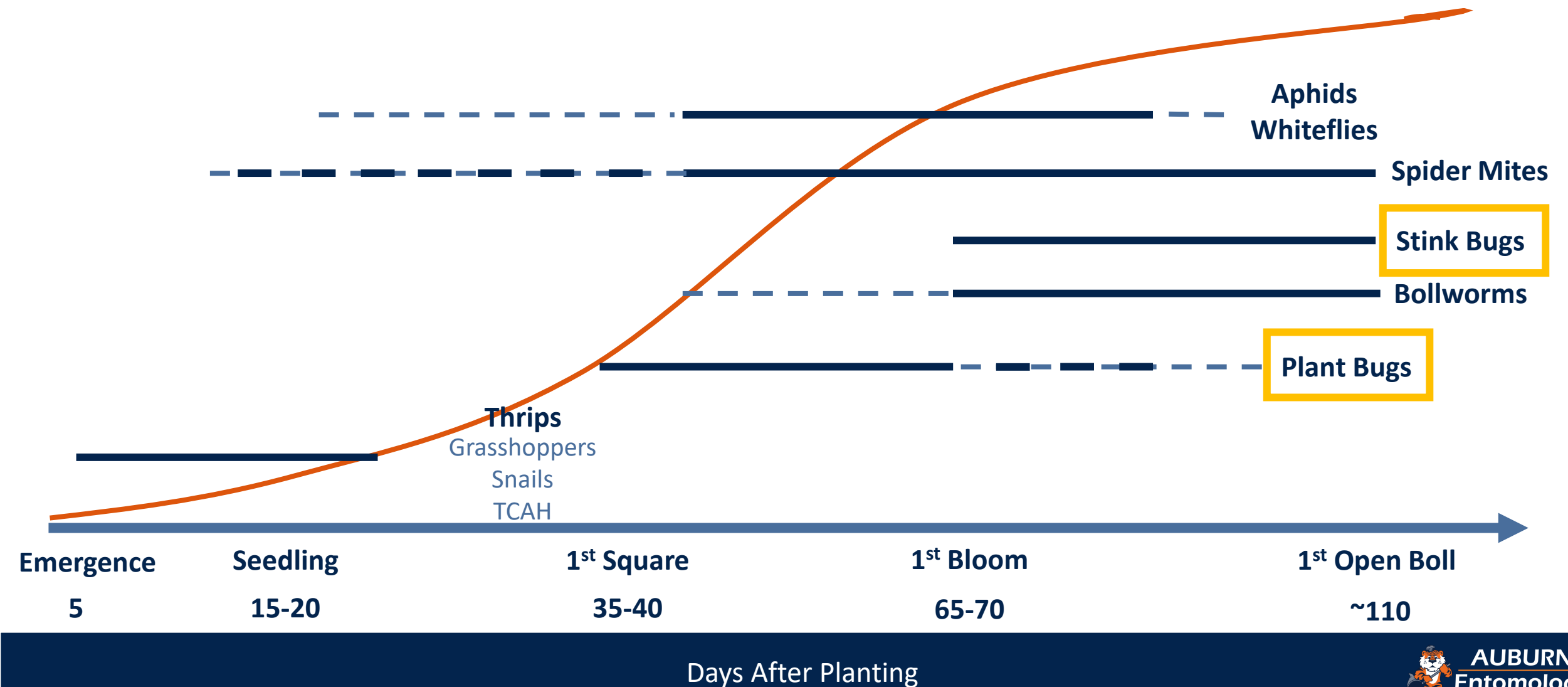
[illegible]

Cotton Insect Detection Tools



- Sweep-Net: Good for rapid detection of some insects
 - Adult Plant Bugs
- Drop-Cloth: Good for more intense sampling
 - Immature Plant Bugs
- Boll Card: Used to sample for stink bug damage
 - Bolls should be 0.9 – 1.1” diameter
- Hand Lens
 - Help detect/quantify small insects (or mites)

When Common Pests Usually Occur





Plant Bug Life Cycle

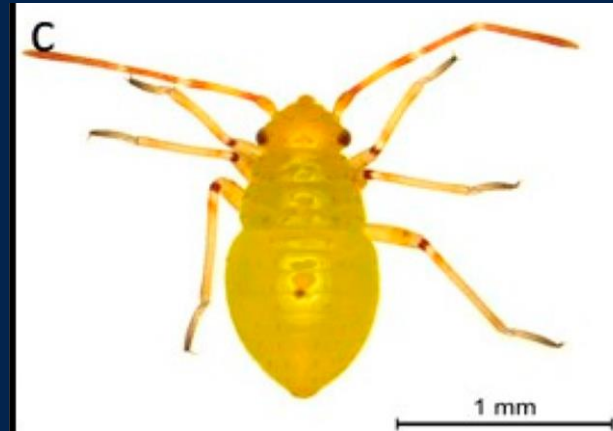
Egg Stage: 7-10 d



1st Instar: 3-4 d



2nd Instar: 3-4 d



3rd Instar: 3-4 d



4th Instar: 3-4 d

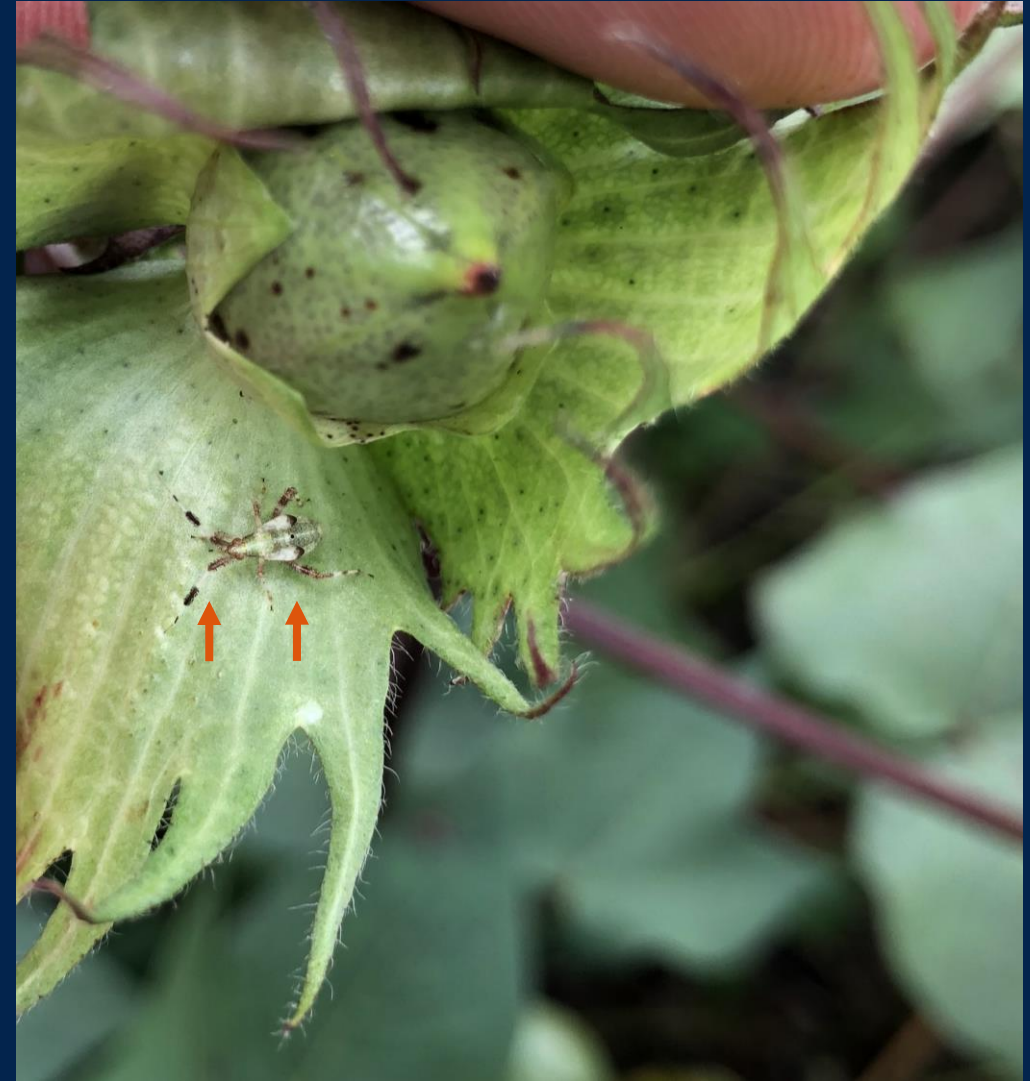
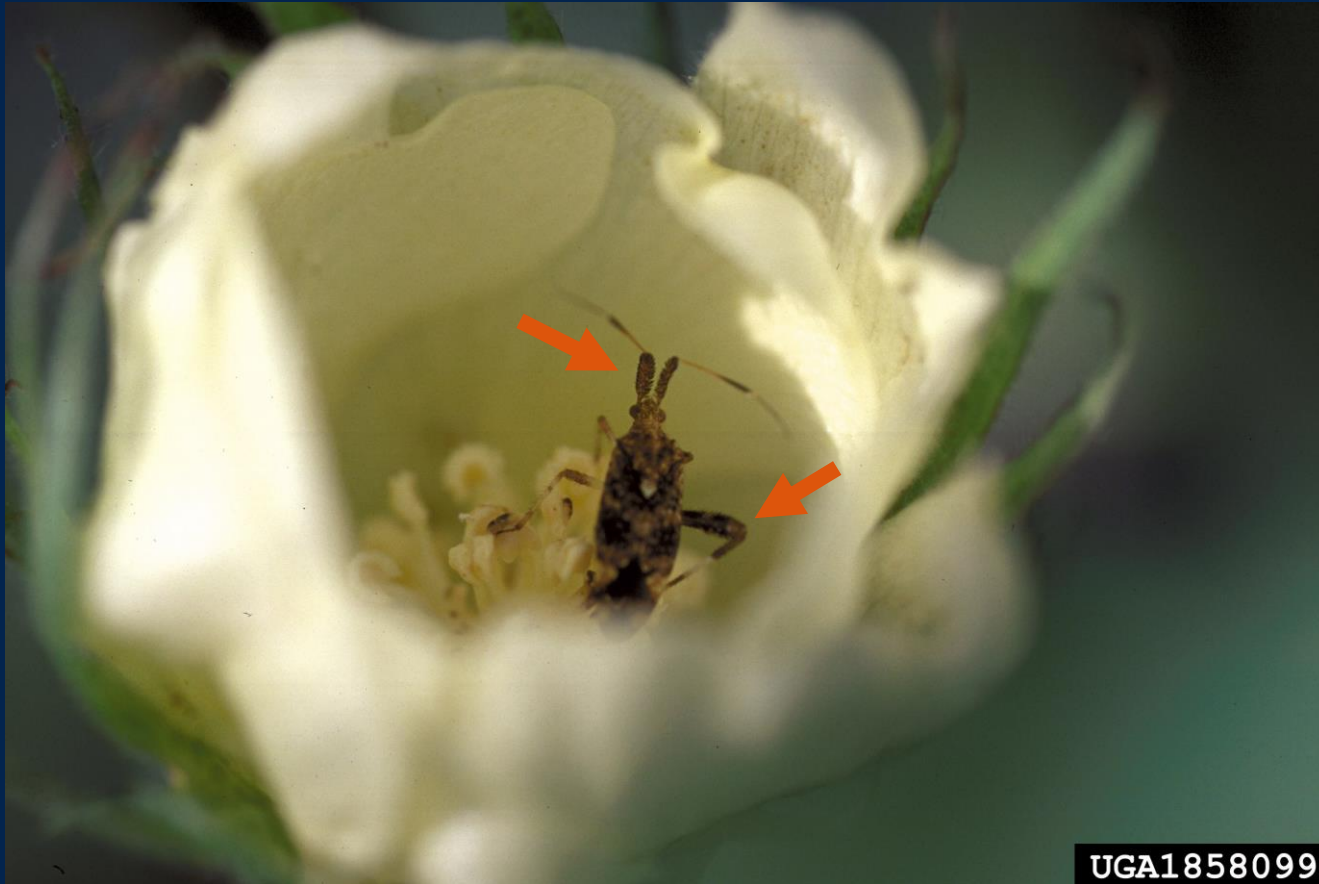


5th Instar: 3-4 d



Adult: Lays eggs in \approx 7 d

Clouded Plant Bugs



Tarnished Plant Bugs

- Life Cycle:
 - First generation begins as adult on weeds (fleabane) in early spring
 - Female adults lay 50-150 eggs(embedded into plant) which hatch in 7-12 days
 - Hatchling to adult in 15-21 days
 - Fresh female adults can lay eggs in 7 days

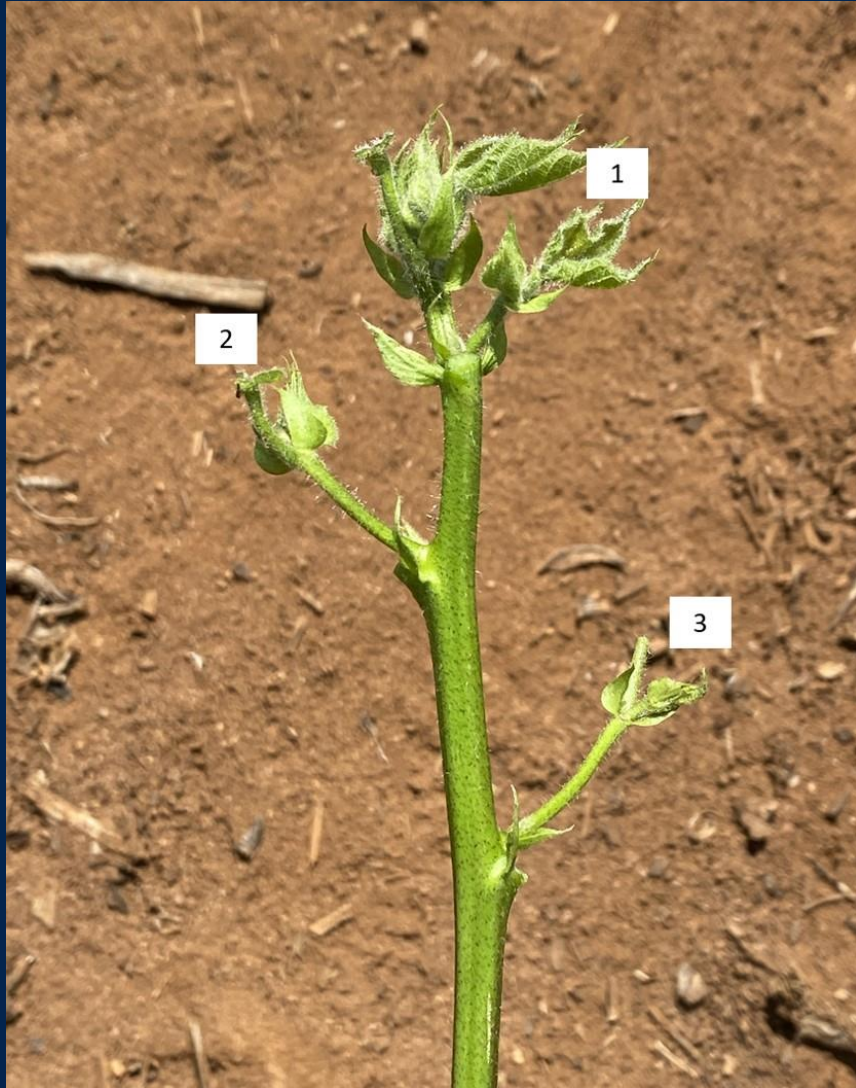


Seth Dorman, VT

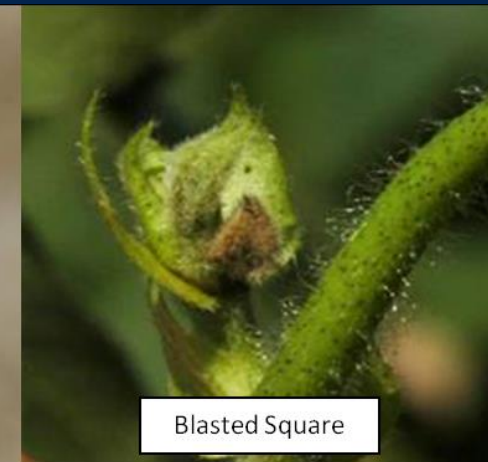
Pinhead Square Plant Bug Injury



Square Retention



Angus Catchot, Miss St



Plant Bug Injury



Scott Stewart, UT

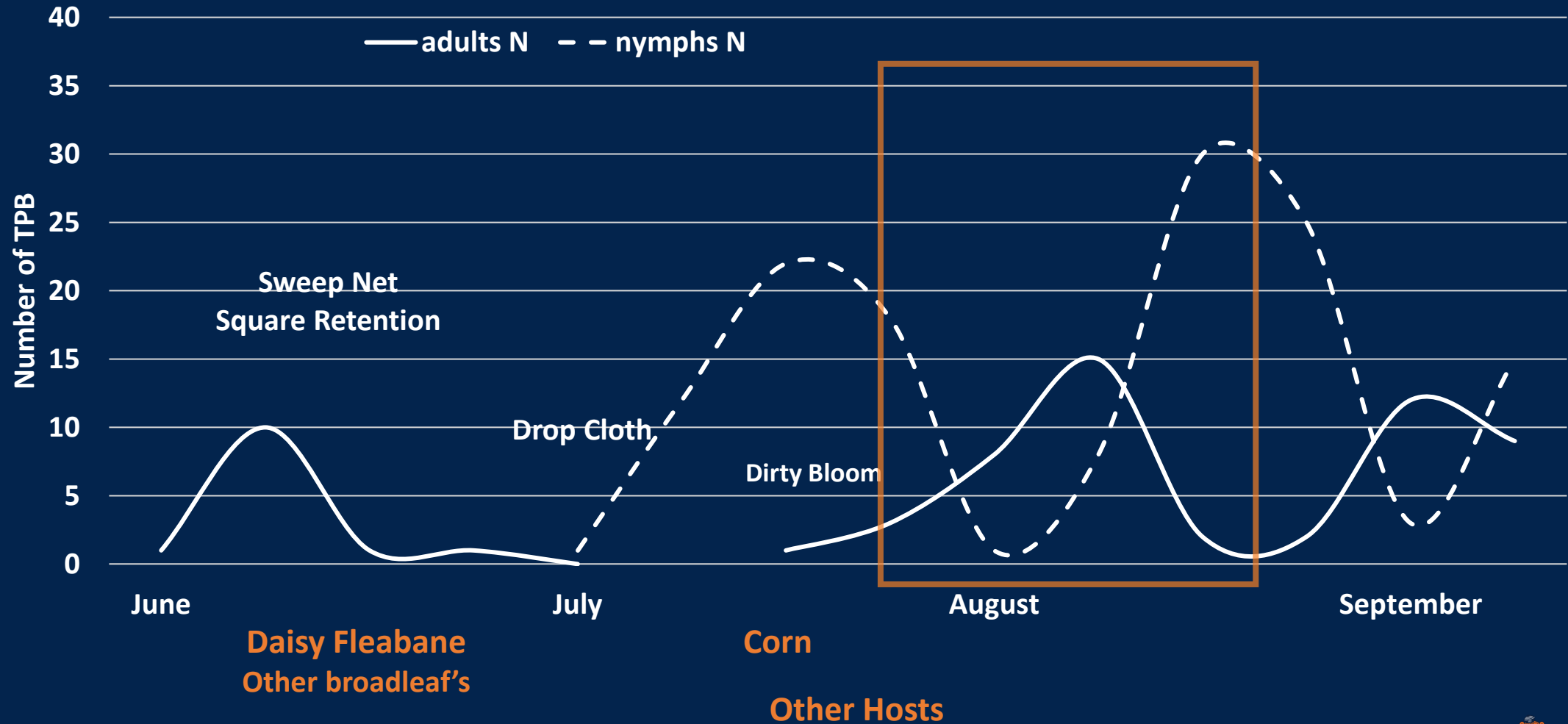
Plant Bug Injury



How Plant Bugs Move into Cotton

Normal Spring

Seasonal Movement of Plant Bugs into Cotton



Plant Bug Reproduction...

**Prior to bloom: TH=8 adults/100
sweeps**

- This is $\approx 1,160$ (assume 50% are female)
 ≈ 580 females/A
- 580 females X ≈ 100 eggs per female
 $\approx 58,000$ eggs/A
- Account for $\approx 50\%$ mortality yields
 $\approx 29,000$ nymphs/A (around 1st bloom)
(TH = 8,712 nymphs/A) ($29,000 = 3.3x$)

($29,000 / 2$ F) X 100 eggs $\approx 1,451,200$ eggs/A
1,454,200 (50% M) $\approx 725,600$ nymphs/A
($725,600 / 2$ F) X 100 eggs (50% M)
 $\approx 18,140,000$ nymphs/A

**≈ 50 fold increase
each generation
(≈ 30 days)**

When to treat for plant bugs...

Pre-Bloom:

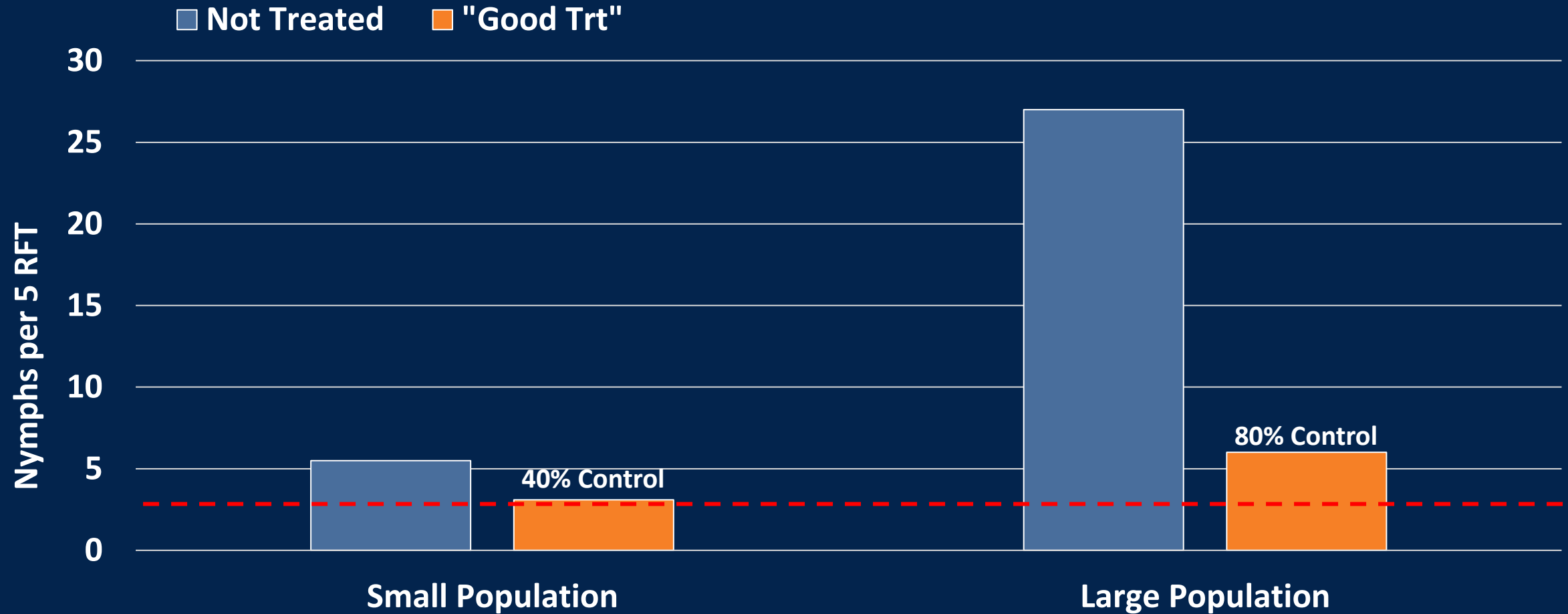
- 8 bugs/100 sweeps
- Maintain 80% square retention

After First Bloom:

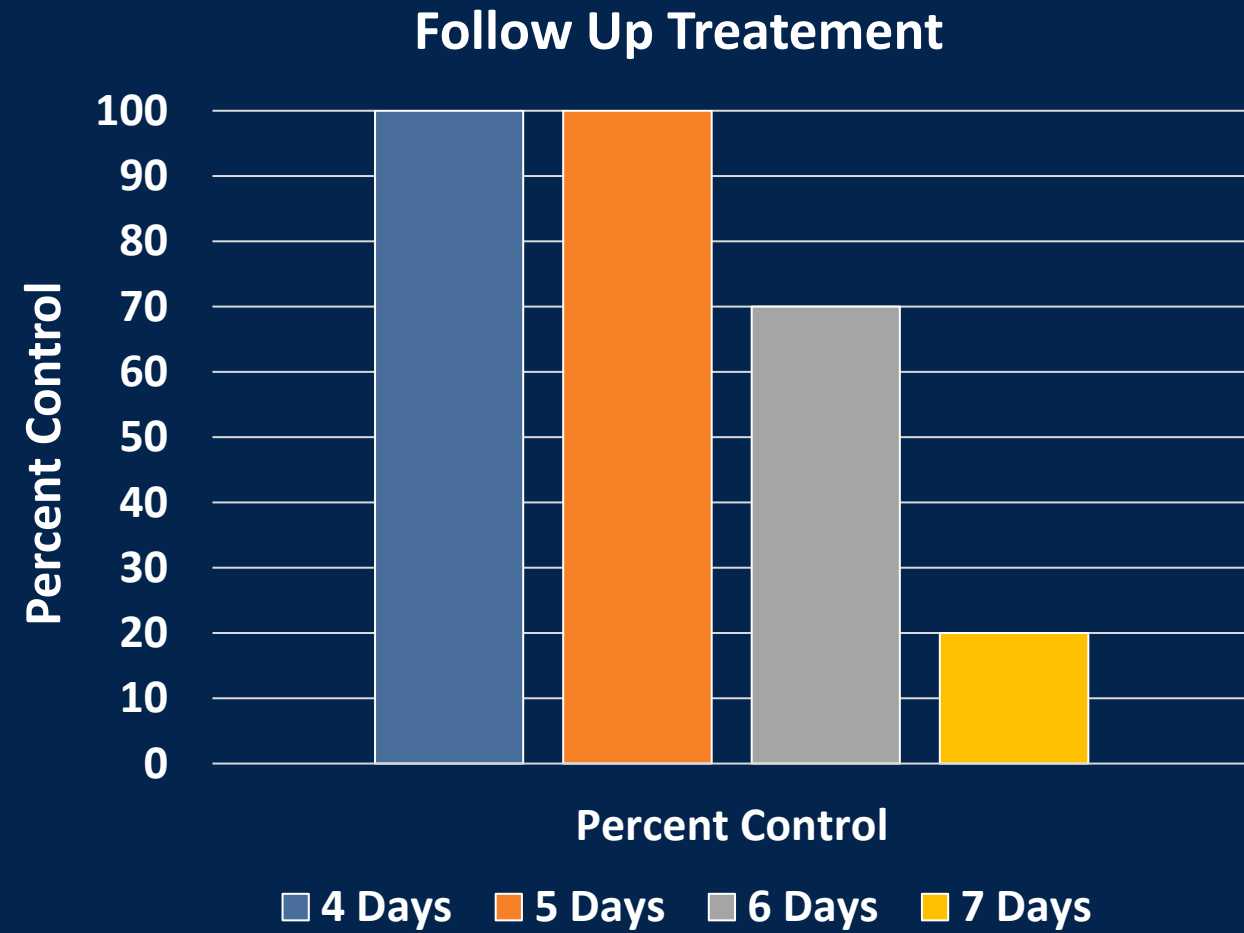
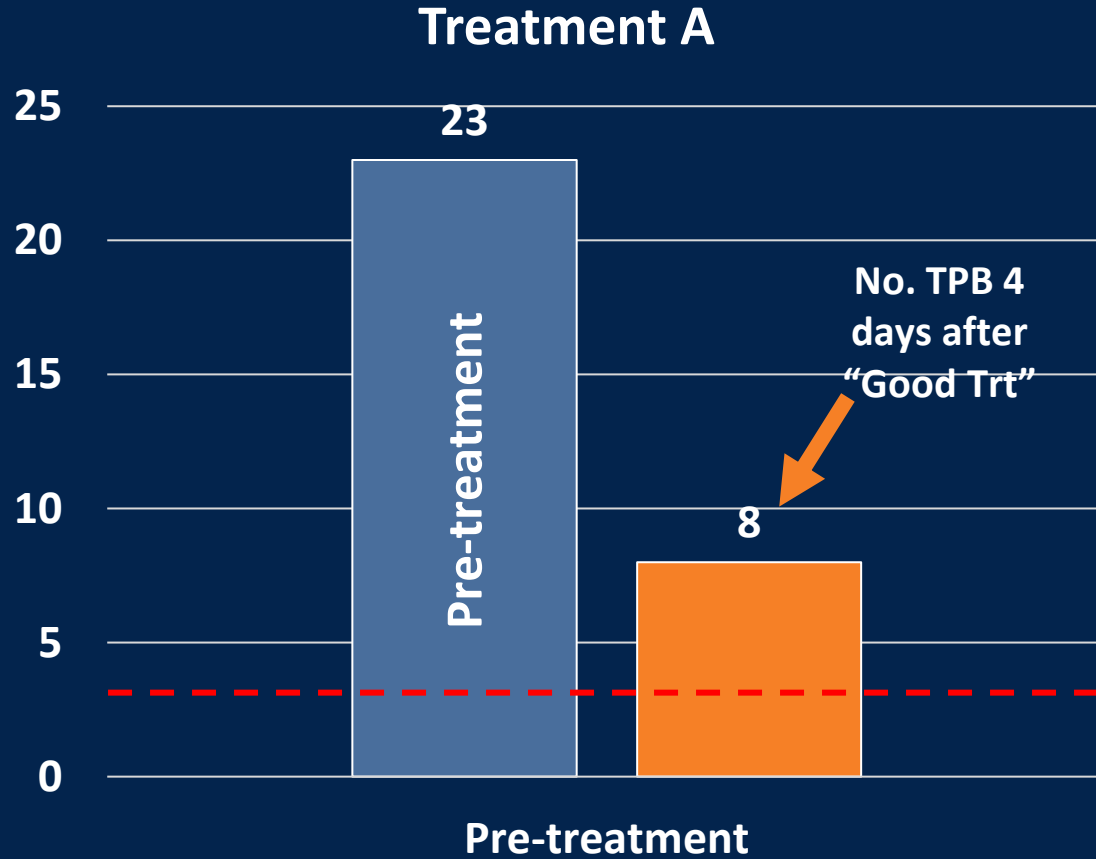
- 3 bugs/5 row feet (1 drop cloth)
- If no drop cloth: 10% dirty squares
- 15 bugs/100 sweeps



Size matters...



Shorten Spray Intervals vs High Pressure



What about rain?

- Excessive rainfall events causes issues with plant bug controls in a couple ways...
1. Insecticide wash-off/reduced residual
 - More rain = more impact (less rain = some impact)
 - Harder rain likely has more impact
 2. Difficulty managing plant growth
 - Rank growth makes insecticide coverage more difficult
 - Plant bugs prefer to feed on larger squares (harder to get coverage)



Plant Bugs and Corn



Plant Bugs and Corn



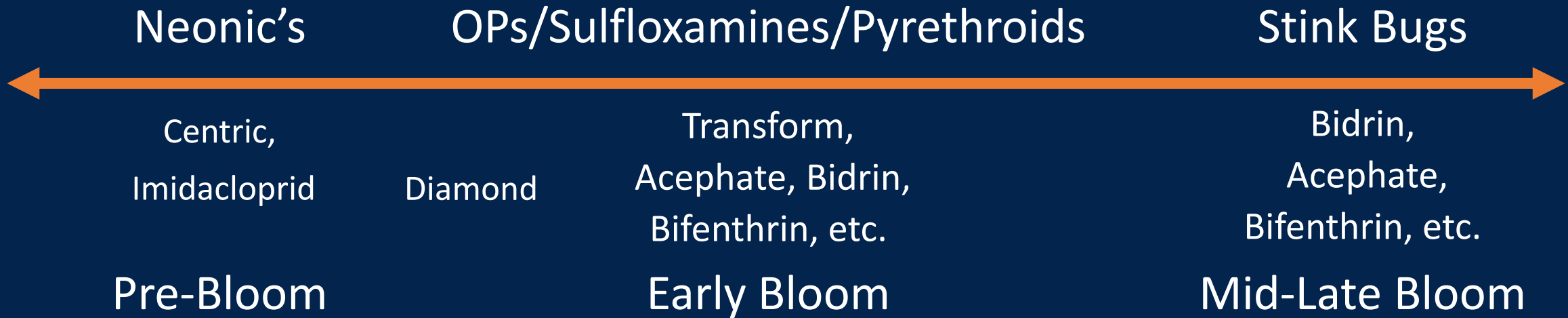
When plant bugs moving out of corn??

- When are they moving in?
 - Peak at tassel
 - A few around green silks
- When are plant bugs moving out?
 - If they go in around tassel or around silk emergence...
 - ≈20 days to milk stage
 - Generation turns over around milk (R3) and dough (R4) stages
 - Migration is over by brown silk stage

Insecticide Use Strategies

- Using different classes of chemistry in a logical sequence (and manner) to prevent or delay resistance
 - For example, we typically do not recommend the use of neonicotinoid insecticides after bloom
 - Sometimes easier said than done

An Encourage Use Pattern for TPB in Alabama



Diamond is an IGR and most effective when sprayed on small nymphs.
Tank-mix with a knockdown material ~10 d after initial June adult spray

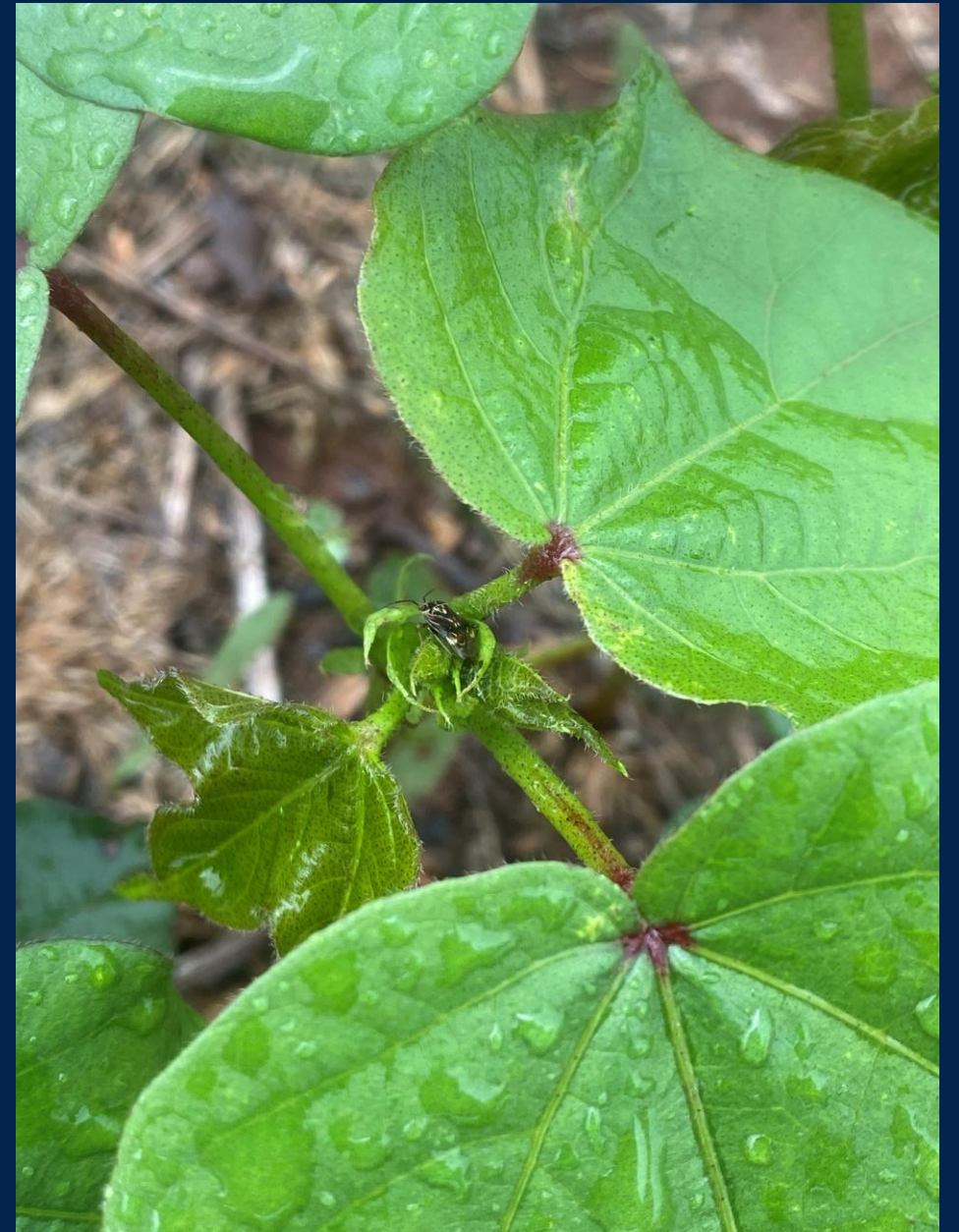
Plant Bug Summary

1. No chemical provides more than 48-72 hours of residual control
2. When populations get out of hand, shorten intervals (4-5 d)
3. In rainy periods or when crop is rank, control is even more difficult
4. Plant bugs prefer to feed in large squares (insecticide coverage is difficult)
5. Smaller populations are easier to control
6. Come out swinging early (June populations determine the rest of the season...)



A Few Reminders...

- **Pre-Bloom:** Focus on *adults* (sweep-net) and pinhead square retention
 - TH= 8/100 sweeps -or- 80% square retention
- **Post-Bloom:** focus on *nymphs* (drop cloth) and dirty squares/blooms
 - TH= 3 bugs/5 rft (1 drop cloth)
- Populations may increase $\approx 50x$ if left unchecked
- “Embedded” populations of nymphs are harder to kill
- More corn in a local landscape may = more plant bug pressure



What about ThryvOn?

- ≈30% fewer plant bug nymphs
 - Population “peaks” 7 days later
- ≈50% fewer dirty blooms
 - Injury also less severe
- ≈150 lb lint increase in yield
 - When sprayed at thresholds
- ≈25% fewer applications (1.3)
 - Vs NTO cotton in my experience



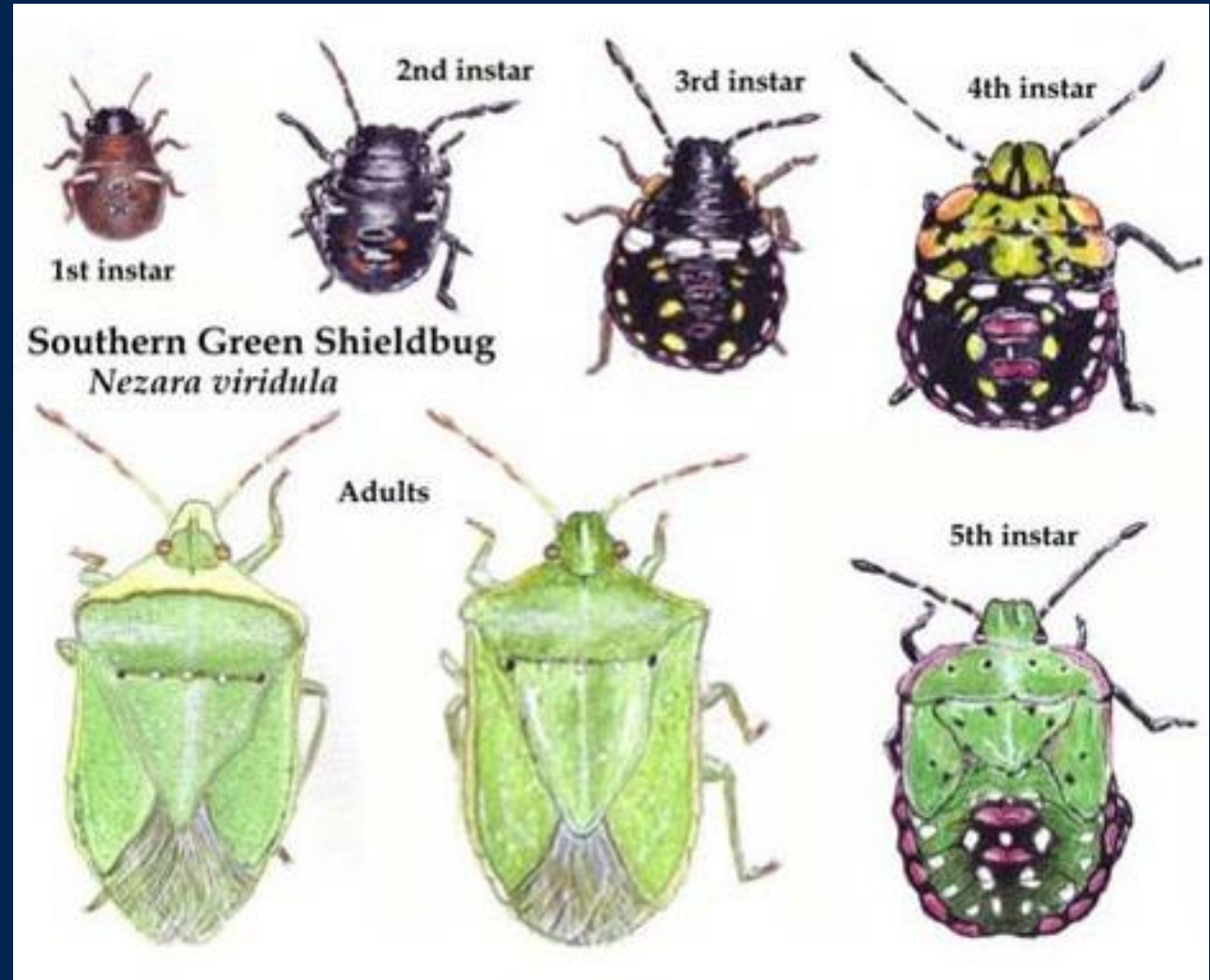
Stink Bugs in Cotton

- Most damaging insect pest in over 2 million acres across the southeast
- Stink bugs are annually a 2-3 spray test for most of the southeast



Stink Bug Life Cycle

- Longer than other cotton insects
- Up to 60 days
 - 30 immature + 30 adult
 - Adults do most of the damage

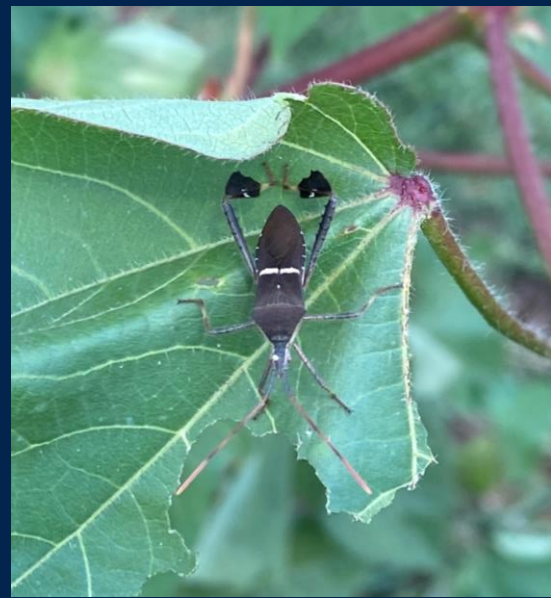


Stink Bug Life Cycle

Overwinter as adults

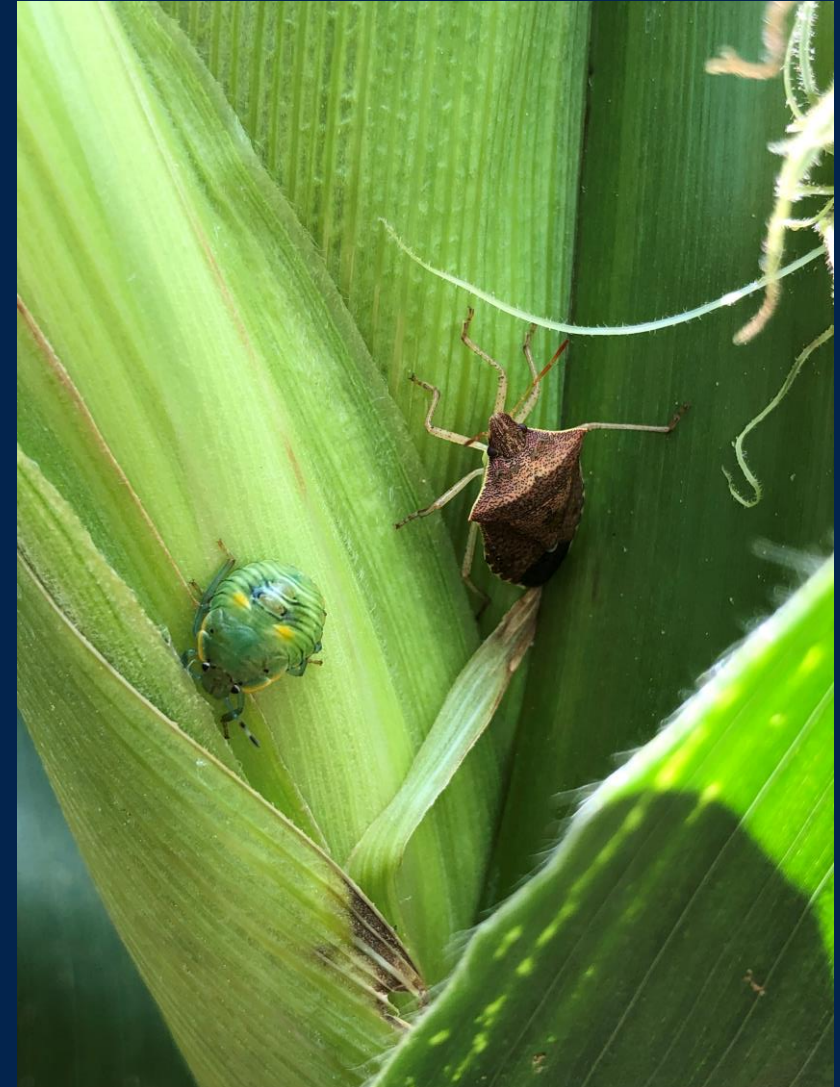
- Spring: Feed on clover, wild hosts, wheat
- Next: Mover to corn as it dries down
- Later: Move to cotton, peanuts and pecans; soybeans as pods develop





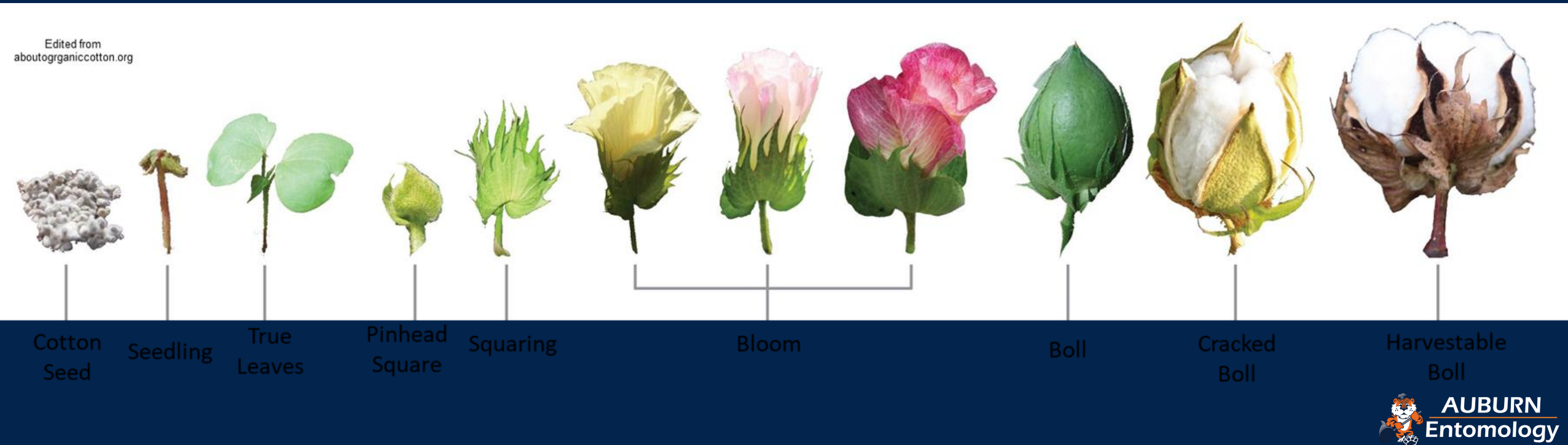
Stink Bug Species: Seasonal Shifts

- Brown Stink Bug more cold-tolerant
 - More dominant on wheat
- Green and Southern Green more prolific, reproduces on corn
- Browns tend to be most numerous in early July
- Green and Southern Greens dominate from early August to end of season**



Stink Bugs: Little time to compensate

- Target developing bolls, prefer 10-12 days old
- Think about plant bug management and cotton growth and development...



Stink Bugs: Little time to compensate

- From pinhead square to white flower is ≈ 3 weeks
- Plant bug threshold = 80% square retention
 - Why? Can't keep them all...plant can compensate...
- Stink bugs prefer bolls 10-12 days old
 - That's nearly 5 weeks of development into a fruiting position gone
- Simply not as much time to compensate

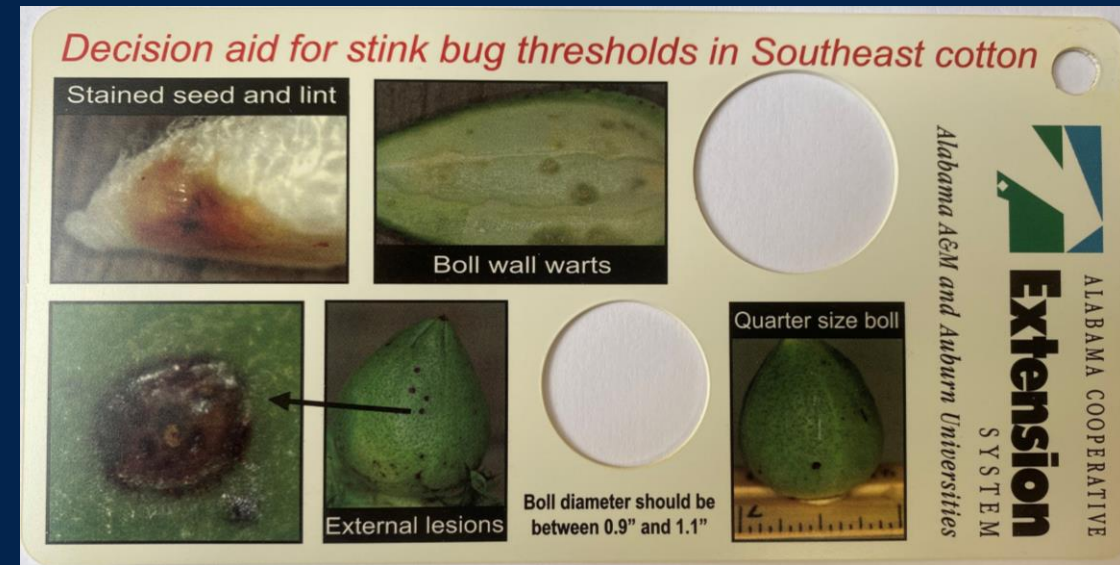


Scouting for Stink Bugs in Cotton



Scouting for Stink Bugs

- Stink bugs are seed feeders by nature
- Prefer bolls 10-12d old
 - ≈ 1 in diameter (size of a quarter)
 - Still a little spongy to the touch
- Crush or open bolls and look for **internal** damage
 - Wart on interior carpel wall
 - Pinprick punctures through carpel wall
 - Stained lint or deteriorating seed



Stink Bug Damage



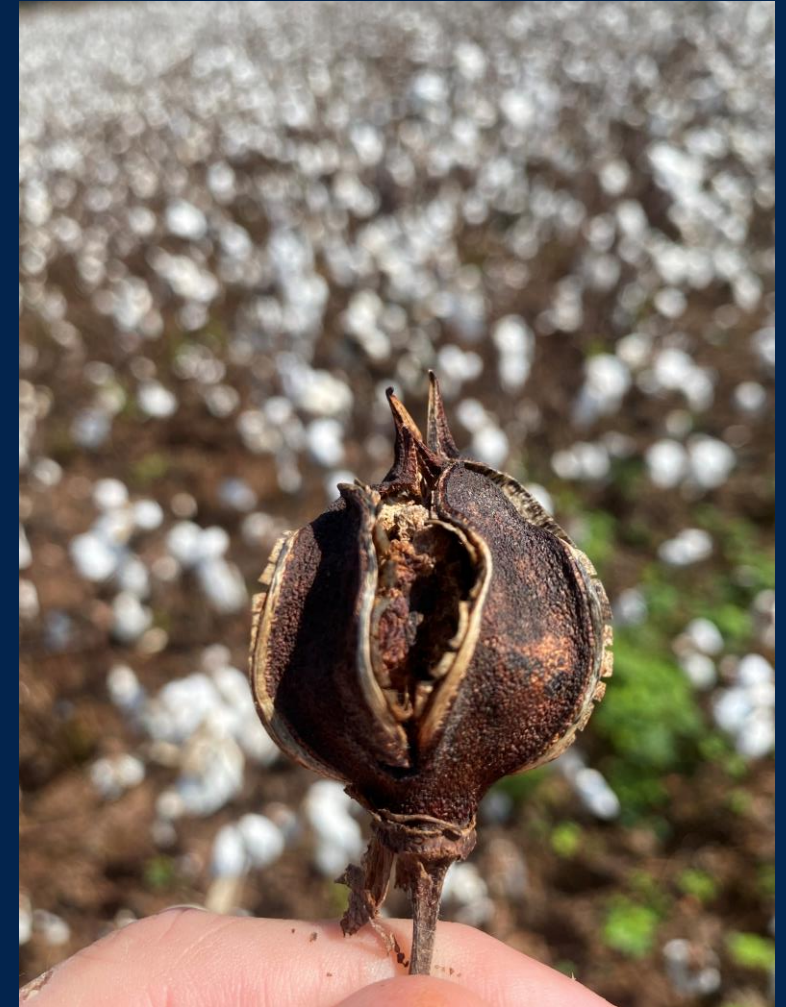
Stink Bug Damage



Stink Bug Damage



Stink Bug Damage



Stink Bug Damage

Treated for STB

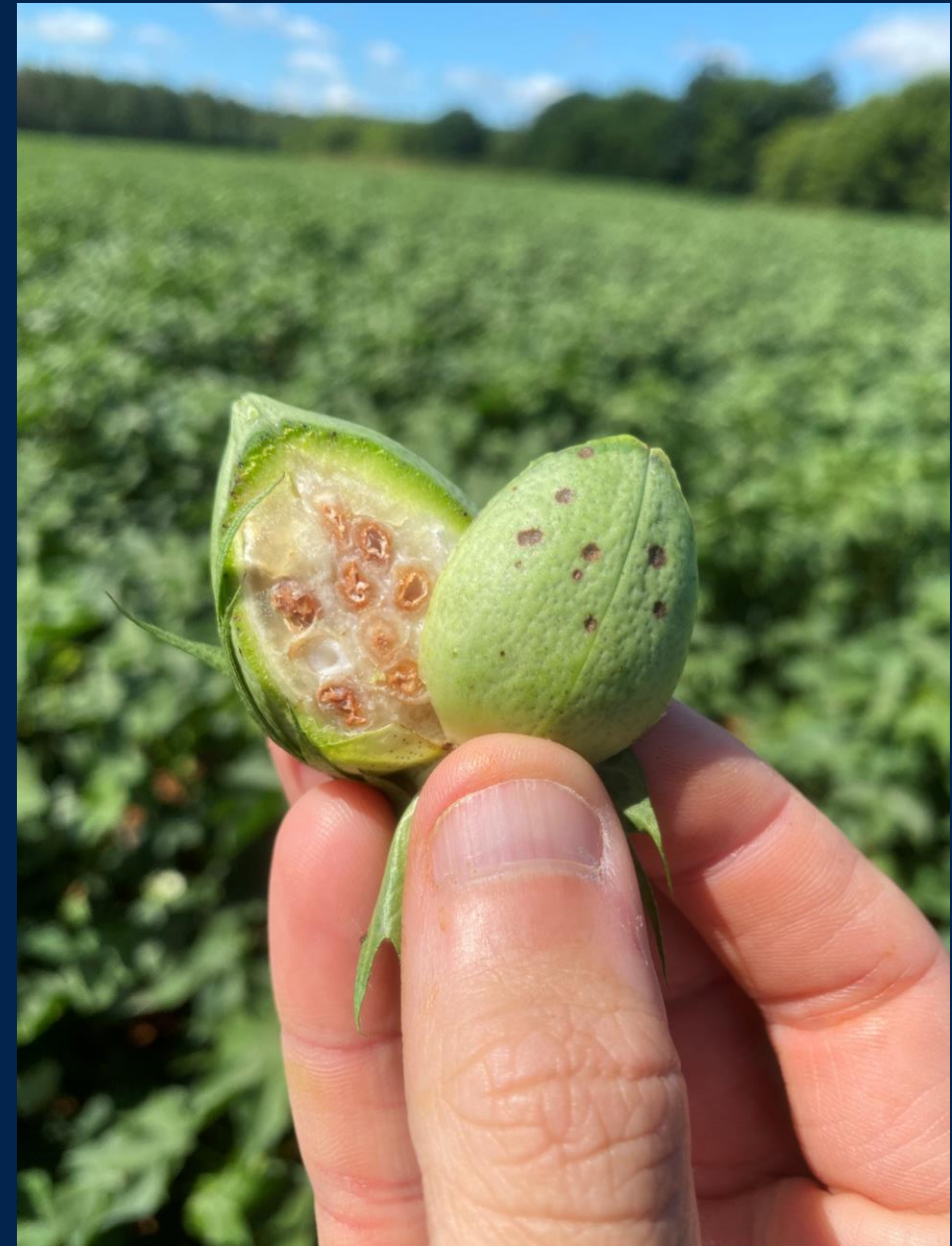


Not Treated for STB



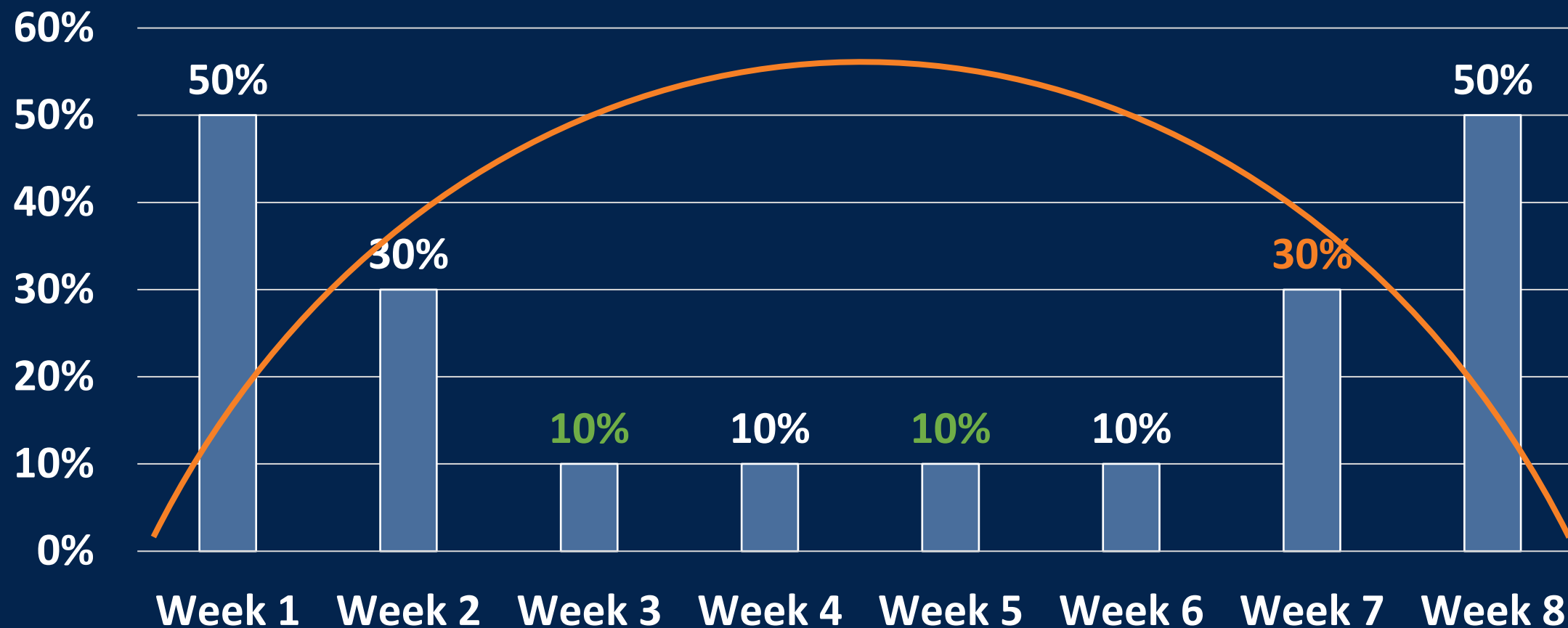
Decision Aid for Stink Bugs

- Pull a random sample of quarter size bolls
 - Not all from field borders
 - At least 2 areas of the field
- Pull at least one boll per acre
 - Minimum of 15-20 bolls per field
- Begin sampling bolls with external lesions
 - Look for internal damage
- Smaller fields at higher risk
 - Stink bugs are weak flyers and initially infest borders (≈ 50 ft). Smaller fields at higher risk than larger fields (100+ acres)



Stink Bug Threshold

% Internal Damage



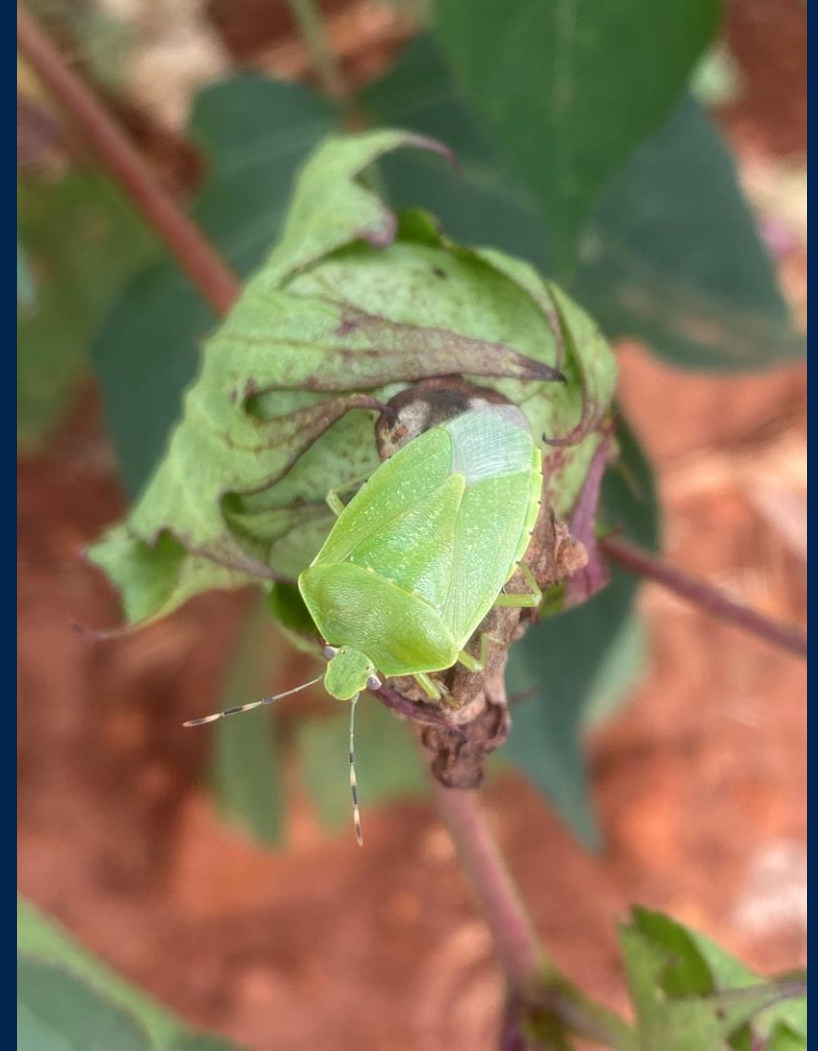
Stink Bug Controls

- The good news is stink bugs are not difficult to control
- Organophosphates: Bidrin, acephate
 - Recommended if population is primarily made up of brown stink bug or leaf-footed bug
- Pyrethroids
 - Bifenthrin
 - Many others
- The BMSB can be controlled by most labeled insecticides



Other Relevant Points

1. Corn is a stink bug trap crop – treat corn and minimize numbers in cotton.
2. Stink bugs will damage thumb-sized bolls post-bloom in cotton if more mature bolls are not present.
3. Stink bugs will remain and damage cotton as long as bolls less than 25 days old are present
4. Stink bugs will move to green (swag) areas of fields late season or to late maturing fields.
5. A stink bug application may hold numbers approximately 14 days unless there is a migration source nearby.





COTTON INSECTS
and
THEIR CONTROL
with
INSECTICIDES

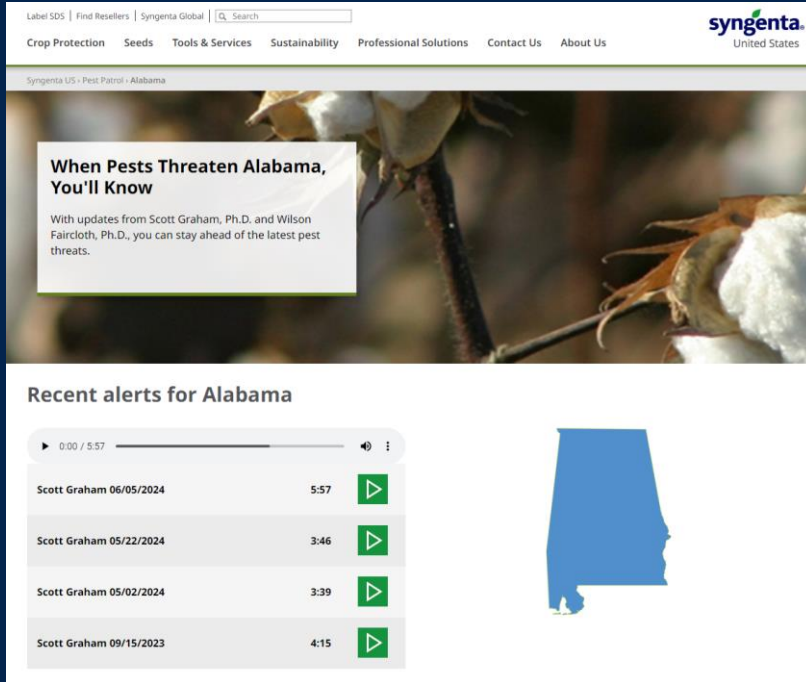
Timeliness

- **Procedures in Control of Cotton Insects**
 - Dr. F.S. Arant (1951)

Procedures based on experimental results have been developed for cotton insect control. These procedures have been tested under various conditions and should be followed for profitable results.

Application of the right amount of insecticide at proper intervals is the most important factor in control of cotton insects. It is more important than deciding which of the recommended insecticides to use, whether to apply dust or spray, or whether to use ground or aerial equipment.

Pest Patrol Update
Text PESTPAT11 to 97063
www.syngentaus.com/pestpatrol



The screenshot shows the Syngenta United States website. At the top, there's a navigation bar with links like 'Label SDS', 'Find Resellers', 'Syngenta Global', and a search bar. Below this, a main header features a large image of cotton plants with a text box that reads: 'When Pests Threaten Alabama, You'll Know. With updates from Scott Graham, Ph.D. and Wilson Faircloth, Ph.D., you can stay ahead of the latest pest threats.' Below the header, there's a section titled 'Recent alerts for Alabama' which includes a video player showing a list of alerts from Scott Graham dated 06/05/2024, 05/22/2024, 05/02/2024, and 09/15/2023. To the right of the video player is a blue map of Alabama.

Questions?

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Alabama-insects.blogspot.com

Wednesday, June 5, 2024

Tales of Cotton Insects: June 4, 2024

Plant Bugs Invading Alabama Cotton

Over the couple days, we have received multiple reports or observed adult tarnished plant bugs in April or early May planted cotton across central and north Alabama. In most cases, populations were below threshold, and a few squares were missing. However, some fields are at threshold and treatments are going out. Thus far, reports from southwest and southeast Alabama are that few or no plant bugs are being observed.

As our earliest fields begin to square, monitor pinhead square retention on the upper 2 or 3 nodes of plants. Our goal is to maintain 80% of these first position squares (closest to the mainstem). The reason to monitor the upper 2 or 3 nodes each week is that these are the "new squares" that were put on in the current week (added since last week's scouting trip). In addition to monitoring square retention, a sweep-net is a good monitoring tool to determine the level of adult plant bugs in the field (threshold is 2 adults per 25 sweeps). Even if square retention is above 80%, we recommend treating adults because they will start feeding on pinhead squares and depositing eggs that will hatch in the following 7 to 10 days.

Our general recommendation for adult plant bug control is the high rate of imidacloprid or 1.75-2oz of Centric. In some areas, bifenthrin is also an option. In cases of high pressure, acephate may also be considered or tank-mixed with imidacloprid. We generally try to stay away from acephate and bifenthrin to preserve better beneficial insects and for resistance management, however under heavy pressure we need to worry about plant bugs and deal with other issues if/when they arrive.



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