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# PECAN INSECT PEST MANAGEMENT

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Newly-planted



~20 years old

## ORCHARDS AT VARYING AGES



>40 years old



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# Managing Pests on Young Pecan Trees



- Ambrosia Beetles
- Bud moth
- Borers
  - Flat-headed apple borer
  - Clear-wing moths
  - Twig Girdler
  - Twig Pruner





# Ambrosia Beetles



Trees infested with Ambrosia beetles



- Attacks most prevalent in the spring, on young stressed trees
- Traditional barrier sprays not very effective
- Traps can detect the start of the flight

# Ambrosia Beetle Monitoring



- Bolt of hardwood 2"-3" dia.
- Bore a ½" hole down the center and fill with ethanol and cork it
- Deploy traps along woodlines next to orchards by early Feb in south GA
- Traps indicate beetle activity, check traps for 'toothpicks' and/or holes

# Ambrosia Beetle Treatment



Signs of ambrosia beetle infestations.



- Once the flight starts pyrethroids provide short-term protection
- If attacks are detected trunk sprays must be applied quickly to save the tree
- Once the trees have leafed out completely, the danger is (usually) much lower



# When are these beetles active?

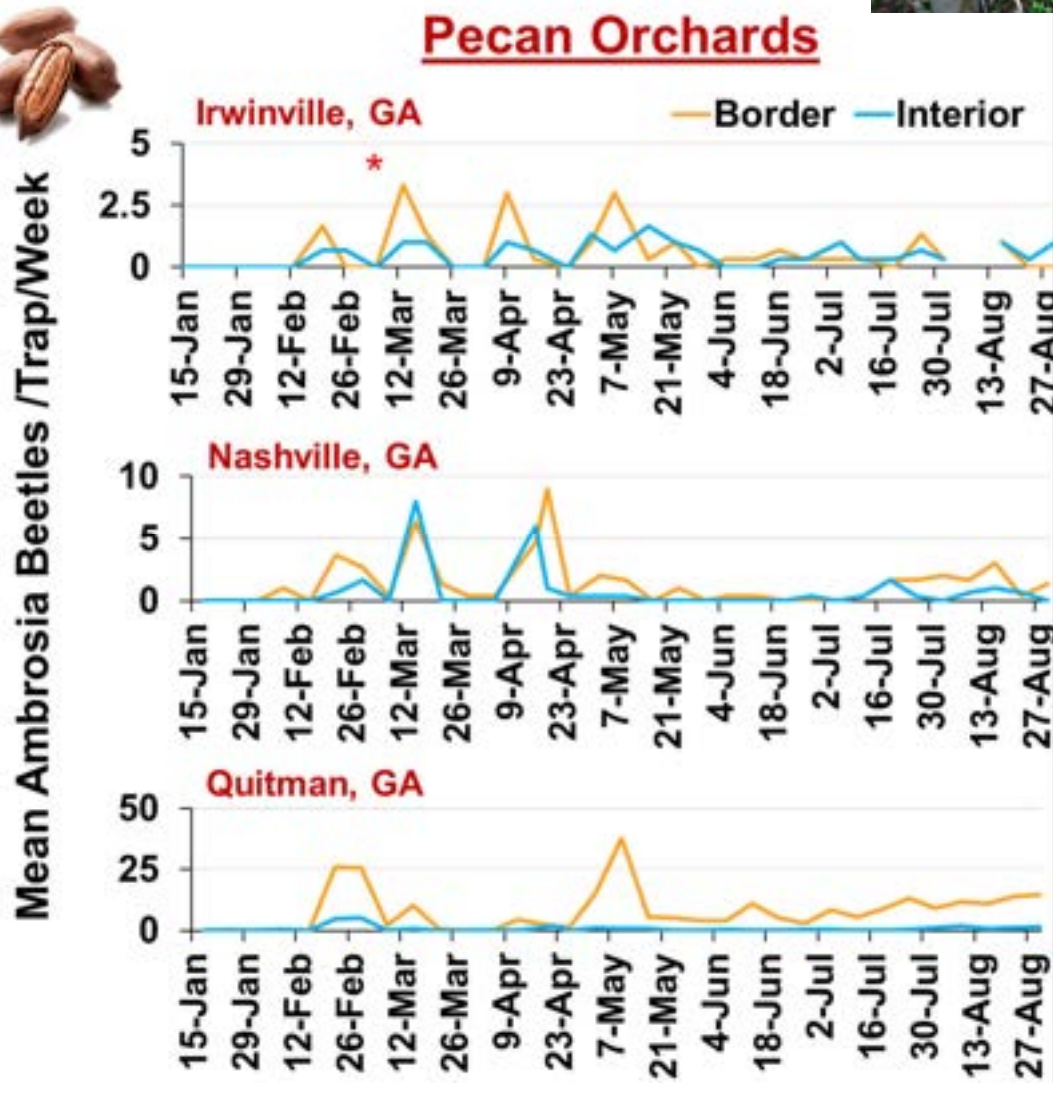


Beetles are present season-long starting in early Feb.

Peak Beetle Activity: late Feb–mid March  
early April–mid May

Beetles are attracted to stressed and unhealthy trees.

**Maintain**  
**healthy trees!**



# PECAN BUD MOTH



- Can be devastating to younger trees
- Attacks start early in the season and continues while trees are flushing new leaves





# Pecan Bud Moth Management



- If symptoms are observed, use caterpillar-targeted materials such as Intrepid
- Time sprays when eggs or larvae are exposed outside of buds and shoots



# Flat-headed Apple Borer



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# Clear-wing Moths

- Often resemble wasps or bees
- Eggs are laid on bark or in wounds
- Caterpillar must chew exit hole before pupating







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# Twig Girdler





# Twig Pruner





# Borer Control

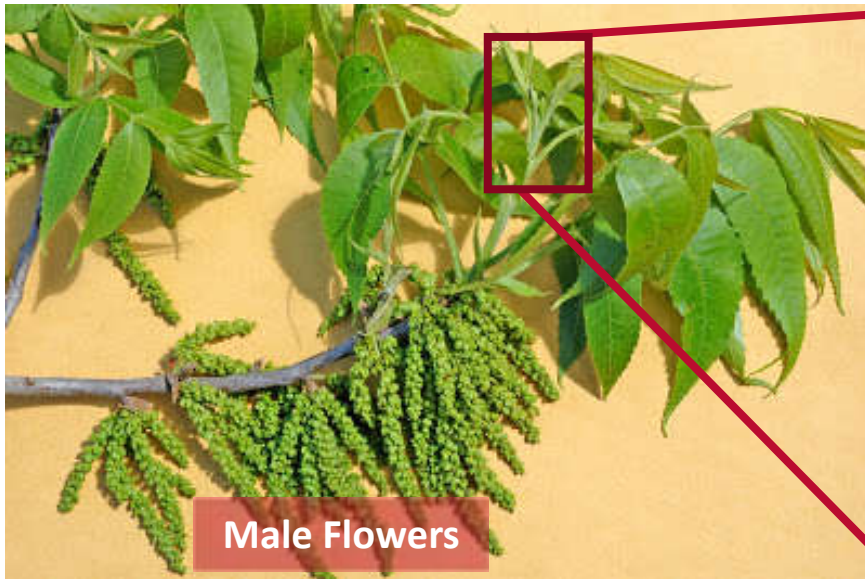
- Usually attack weak or stressed plants
- Control is difficult or impossible once the larvae are in the tree (except Buprestids)
- Traditional barrier sprays worked well, but...
- Pyrethroids are best bet now (except Buprestids)



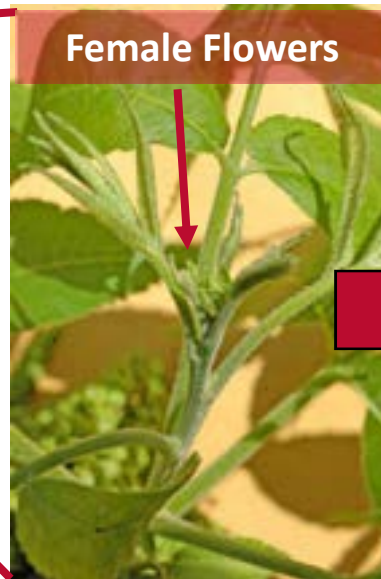
# Managing Pests on Older Nut-Bearing Pecan Trees



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Male Flowers



Female Flowers



Young Nut Clusters



Developing nuts



Shuck Split



Ready for Harvest

# PECAN NUT DEVELOPMENT





## Foliage Pests

Phylloxera  
Spittle Bugs  
Caterpillars  
Aphids  
Mites

## Nut Pests

Hickory shuckworm  
Pecan weevil



# IN ORDER OF APPEARANCE

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT  
NOV DEC

Phylloxera

Nut Casebearer

Spittle Bug

Yellow Aphid Complex

Leaf-feeding  
Caterpillars

Hickory Shuckworm

Nut curculio

Black Aphid

Scorch Mites

Pecan Weevil



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# In Order of Importance

## Must treat (if you have them)

- Phylloxera
- Shuckworm
- Black aphid
- Pecan weevil
- Nut curculio

## Sometimes need treatment

- Yellow aphid
- Scorch mite

## Seldom or never need treatment

- Nut casebearer
- Spittle bug





# Best Business Plan

## Must spend money on

- Shuckworm
- Black aphid
- Weevil
  
- Curculio

## Hold off if possible

- Yellow aphid
- Scorch mite

## Ignore (if you can)

- Casebearer
- Spittlebug



# Objective : Protecting Pecan Foliage



- Budbreak to Harvest: 8 months
- Pecan foliage has to be conserved and protected from insects and diseases to produce photosynthate for next season's crop and to reduce the amplitude of alternate bearing cycle



# Foliage Feeders

**Phylloxera**

**Aphids**

**Mites**

**Caterpillars**





# Foliage Pest: PECAN LEAF PHYLLOXERA

Leaf Galls caused by Phylloxeran feeding



Immature Phylloxera inside a gall



Spray at bug break to target the stem mothers.



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# Foliage Pest: PECAN PHYLLOXERA

- Both leaf and stem species
- Stem species is by far the more damaging
- For both species, treatment window is bud-break



## Foliage Feeders: APHIDS

- Short life cycle and produce many offspring
- Lots of natural enemies, so biological control can be effective
- Scouting is critical
- Both systemic and contact insecticides are used





# Foliage Feeders: SCOUTING FOR APHIDS

- Orchards should be scouted regularly
- Examine a “random” sample of terminals from trees throughout the orchard
- Know how to identify the aphids
- Recognize beneficial insects
- Know your trees and orchard history



# YELLOW PECAN APHID COMPLEX

Yellow Aphid



Blackmargined Aphid



# YELLOW PECAN APHID

- May be found any time during the season
- Winged adults are not always present
- Populations usually peak in late summer





# Foliage Pests: YELLOW APHID COMPLEX



Yellow and/or black-margined aphid infestations



Honeydew excretion from the aphids



Development of Sooty Mold

# Foliage Pest: BLACK PECAN APHID

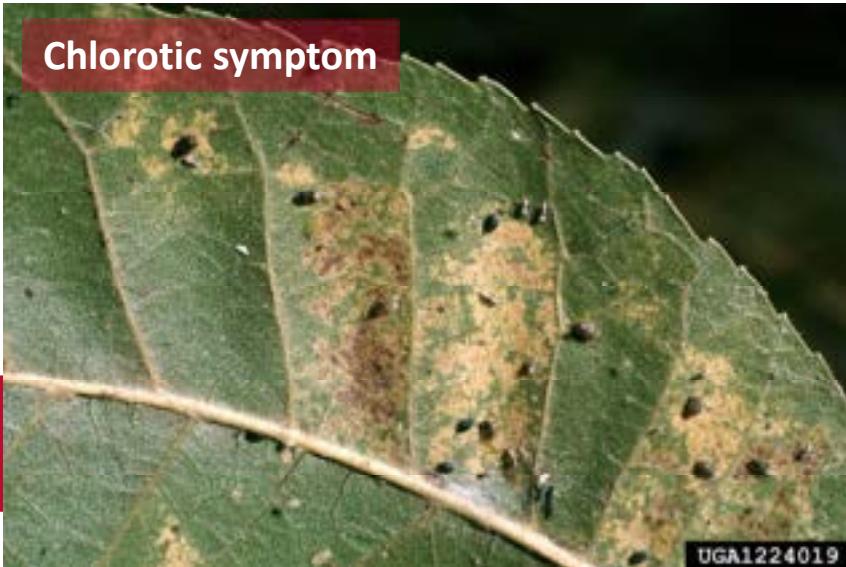
Adult



Nymphs



Chlorotic symptom



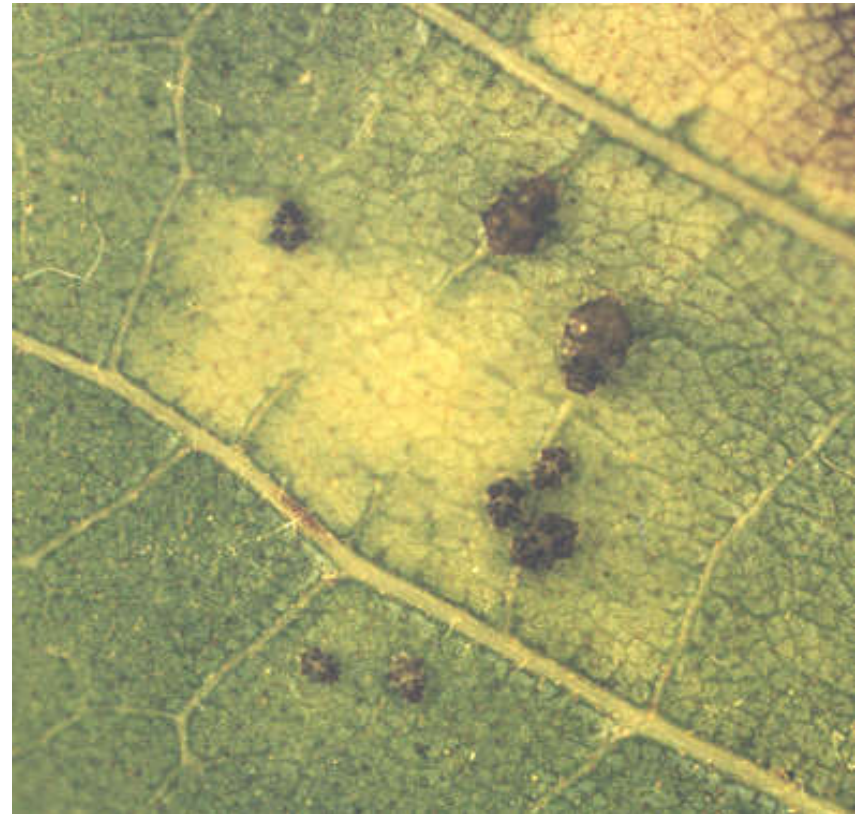
Heavy infestations can cause defoliation.





## Foliage Feeder: BLACK PECAN APHID

- Populations usually peak in late season
- Some varieties are very susceptible to damage
- Feeding causes chlorosis and leaflets drop prematurely



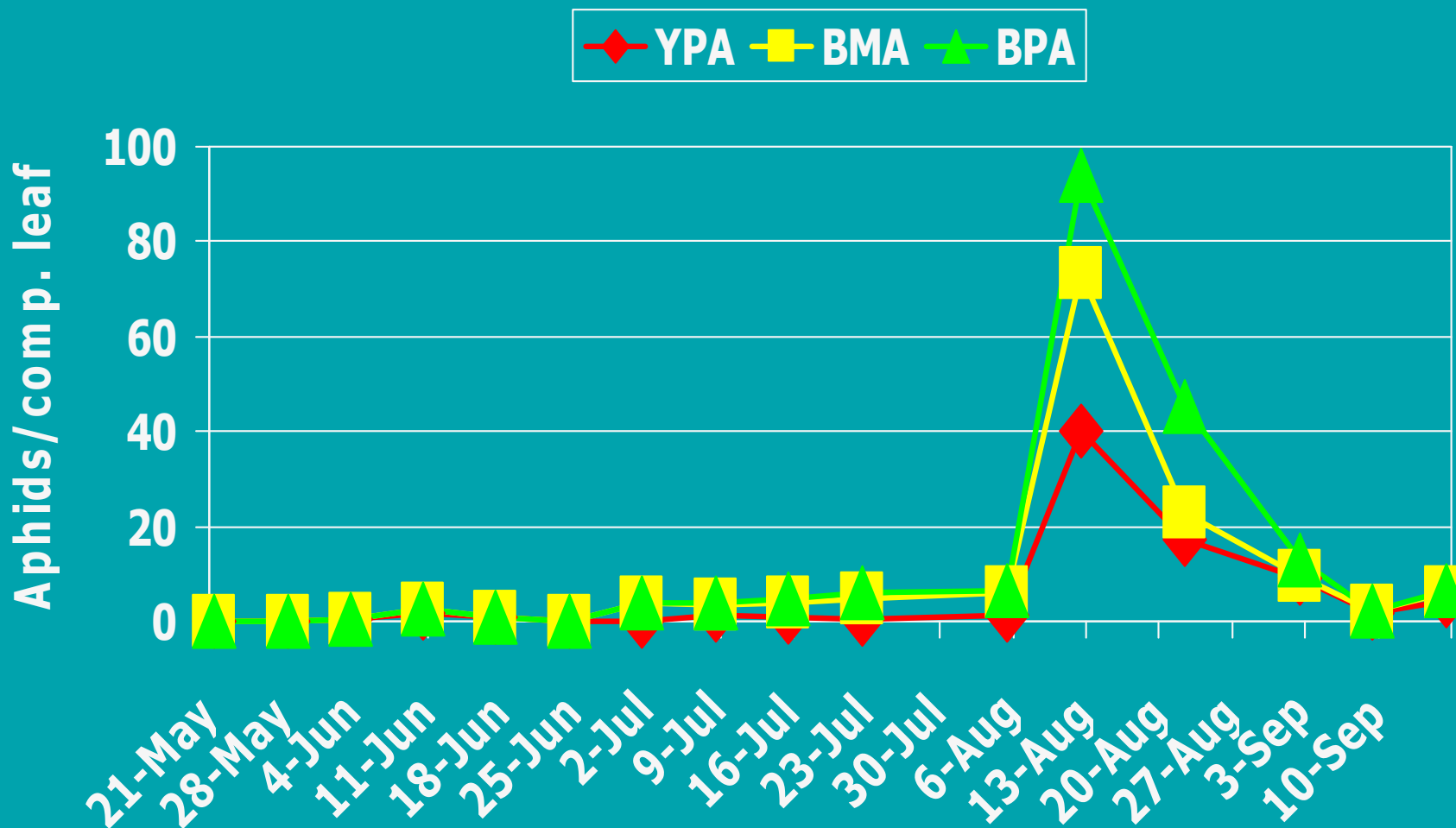


# Foliage Feeder: BLACK PECAN APHID



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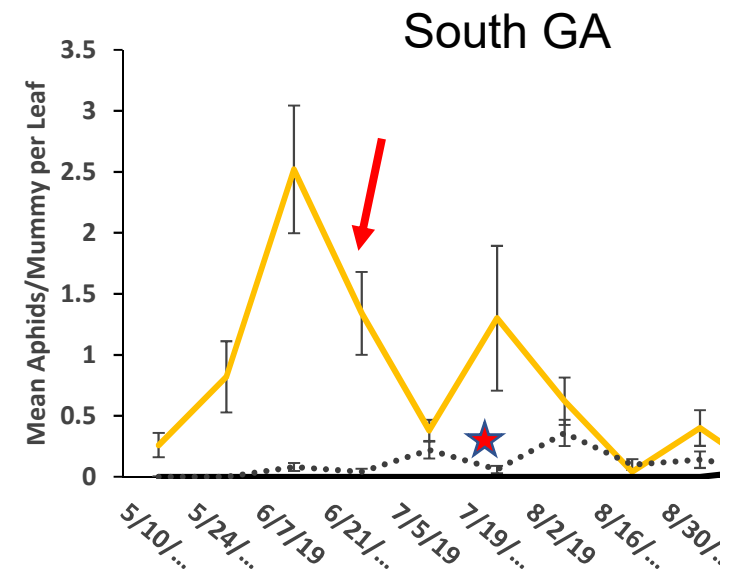
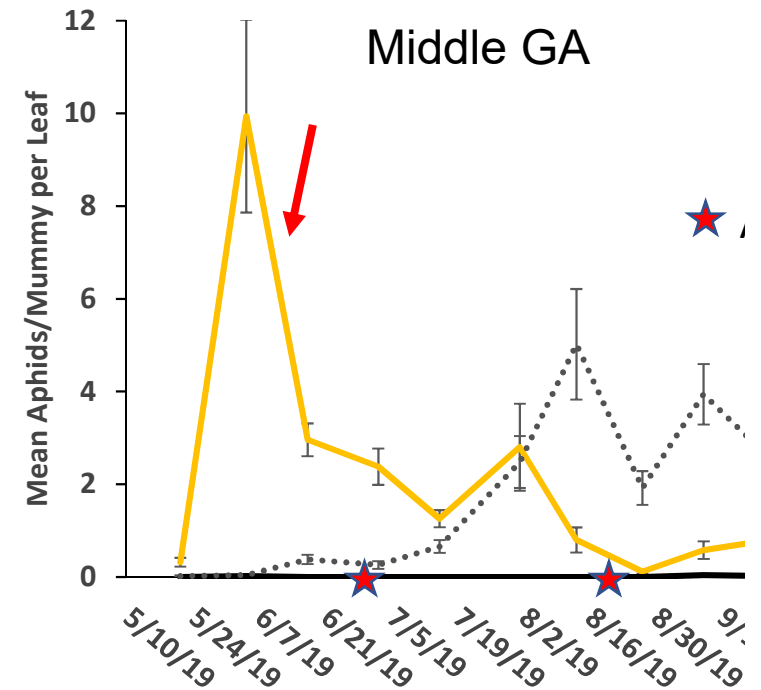
# APHID SEASONAL ABUNDANCE (unsprayed orchard)



## APHID-PARASITOID COMMERCIAL ORCHARD

- Aphid-parasitoid seasonal trends in commercial pecan orchards in GA
- Parasitism started low but increased as the season progresses.
- Yellow aphids more abundant than black aphids, black aphid numbers increased later in the season in the southern sites
- Yellow aphid numbers crashed even without insecticidal applications
- **Grower implication:**

**Forego or delay spraying aphicides early in the season**





# APHID MANAGEMENT

## Chemical Control



- Reliance on beneficial insects for control through early August and foliage application of insecticides later
- Black Aphid: Spraying of gibberellic acid supplement (mid-July) helps in preventing leaf chlorosis

## Biological Control



Predators



Parasitic Wasps

# Foliage Feeder: MITES

- Feeding causes “scorching” effect on leaves
- Mites are usually found on underside of leaflet
- Infestations often start low in the center of the tree
- Miticides are effective but seldom necessary



- ❑ Heavy infestation can cause leaf drop



- ❑ Spraying of broad spectrum insecticides can flare up mite populations

# Foliage Feeder: FALL WEBWORM



- Can feed on numerous host plants
- Occur in groups
- Infestation is characterized by webbing wrapped around the feeding area





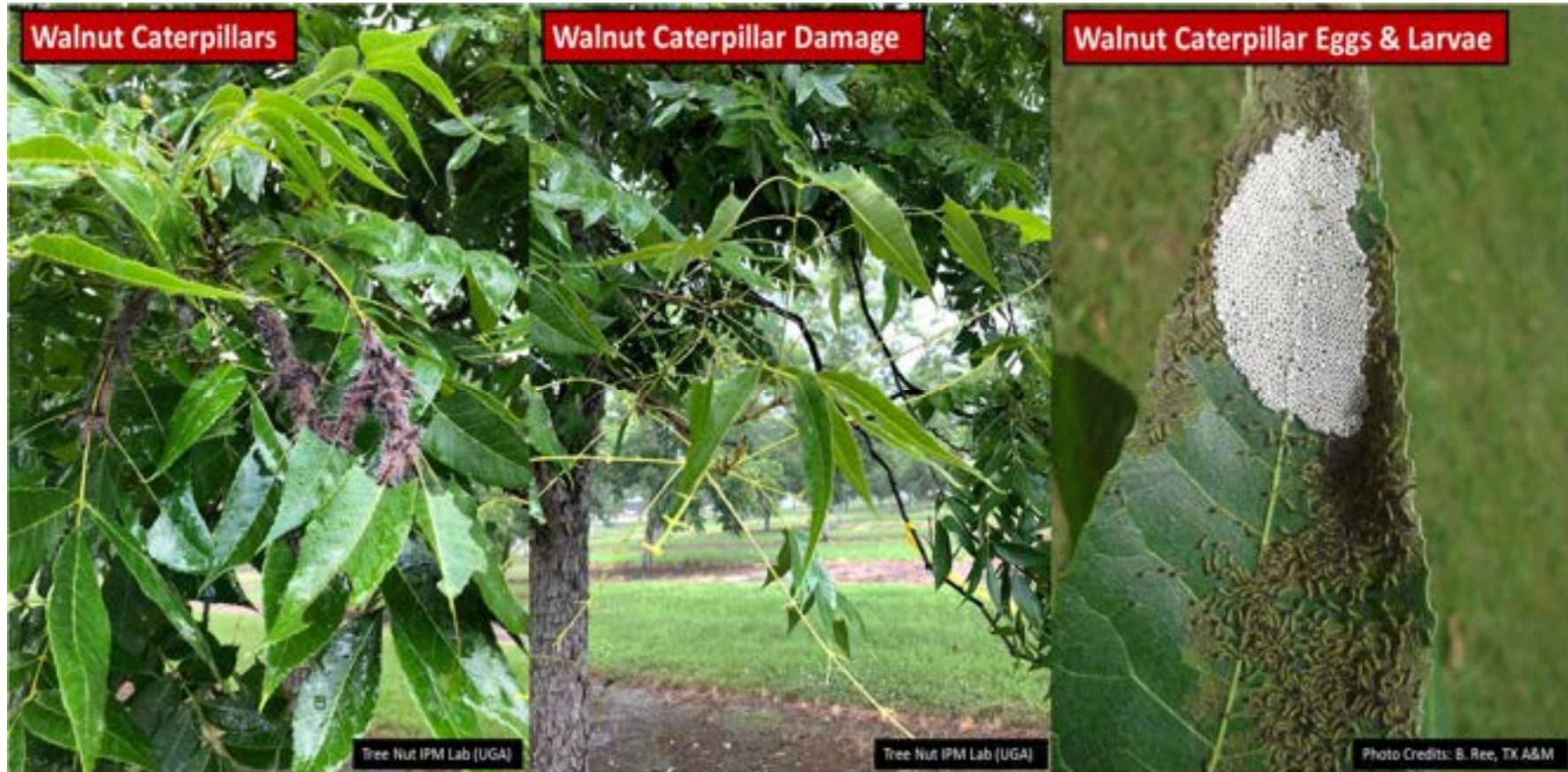
# CATERPILLAR MANAGEMENT



- In low infestations, physical removal and destruction of infested plant materials is recommended
- In high infestations, chemical control can be done
- Biological Control: There are naturally-occurring predators and parasitic wasps that can attack these caterpillars



# Foliage Feeder: WALNUT CATERPILLAR



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- Host plants are limited to the hickories, walnuts, pecans
- Occur in groups
- Damage is characterized by leaf defoliation with no webbing



# Foliage Feeder: SAWFLY



- ❑ Can be devastating to younger trees
- ❑ These are not butterfly or moth caterpillars so caterpillar-specific products do not work against them.







# Nut Pests

- Hickory Shuckworm
- Pecan weevil
- Stink bugs



# Nut Feeder: PECAN NUT CASEBEARER

Adult



Eggs



Larval Feeding



Larva



- More serious in the West than in the Southeast
- Early-season adult activity monitoring is essential in managing first generation infestations.

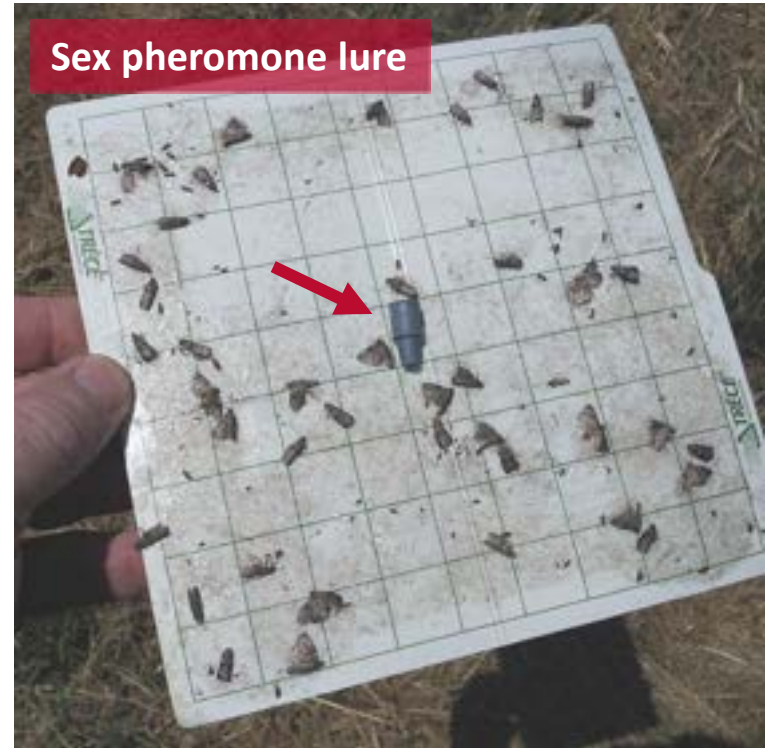


# Nut Feeder: PECAN NUT CASEBEARER MONITORING

Nut Casebearer Trap



Sex pheromone lure



- ❑ Once adults are captured, nut clusters need to be checked 7-10 days after.



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- ❑ Growers are advised to spray if they see eggs or larvae on their nuts.



# Pecan Nut Casebearer (PNC) Monitoring



Home Pest Alert News PNC Risk Map Site Request Toolbox Links

HOME > PECAN NUT CASEBEARER RISK MAP FOR 2020

## Pecan Nut Casebearer Risk Map for 2020



# Nut Pest: HICKORY SHUCKWORM

- Losses from two types of damage
  - Nut drop
  - Shuck mining
- Populations build up in three places
  - phylloxera galls
  - hickory shucks
  - pecan shucks
- Impact of nut drop depends on time of season
- Shuckmining causes loss of kernel quality, marks the shell and gives the larvae a secure overwintering site



## Hickory Shuckworms infest Phylloxera galls



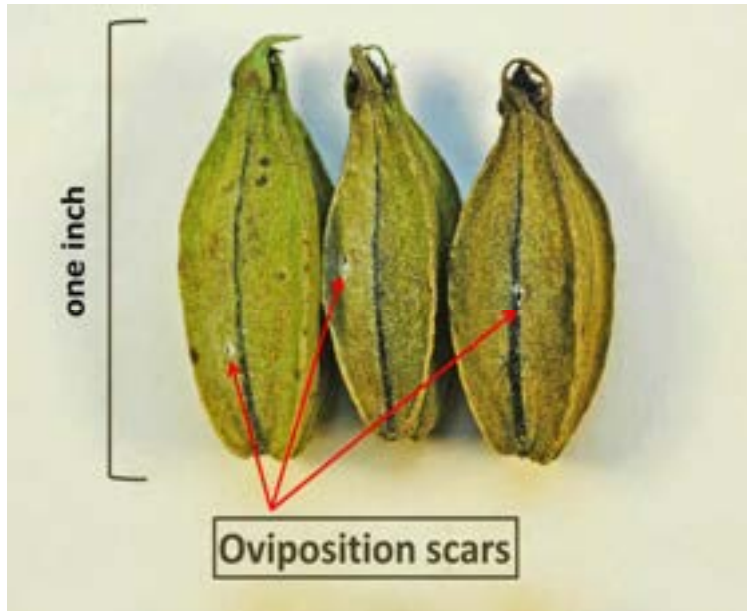
Shuckworm inside a gall

Orchards with phylloxera infestations should manage for first generation shuckworm.





# Nut Pest: HICKORY SHUCKWORM DAMAGE



# Nut Pest: PECAN WEEVIL

Adult



- ❑ Starts emerging by July and high numbers occur between August and September
- ❑ They feed on and lay eggs inside the nuts

Larva



- ❑ Spends 1-2 years in the soil



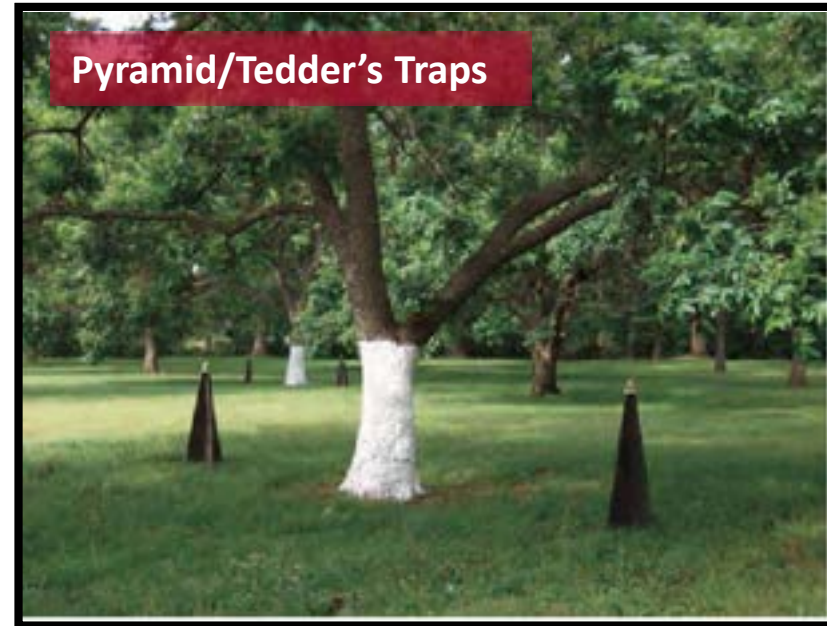
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- ❑ Monitoring for adult activity is vital for management decisions

# PECAN WEEVIL MONITORING



Circle Traps



Pyramid/Tedder's Traps

- These traps are not baited with lures
- These traps rely on the behavior of the weevils to walk up on trees via the main trunk upon emergence



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- Check weevil traps twice per week from late July to mid-October
- Prioritize areas where previous weevil infestation occurred



# PECAN WEEVIL MANAGEMENT

## Spray when:

- Before shell hardens: adult emergence is steady/increasing and significant nut drop occurs  
or
- After shell hardens or pecans are in gel stage: treat when weevils emerge (especially following rain)



## Biological control:

parasitic nematodes, fungi



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# NUT CURCULIO



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# Nut Pests: STINK BUGS, LEAF-FOOTED BUGS



Feeding Injury on the Nuts



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☐ Mid to late season pests



# PREDACIOUS STINK BUGS



# PREDATORY VERSUS PLANT-FEEDING STINK BUGS

**Predatory Stink Bug**



**Plant-feeding Stink Bug**



**Stylet**



# NATURAL ENEMIES

## Lacewing Eggs and Larva



## Lady Beetles





# NATURAL ENEMIES

## Pirate bugs



**Nymph feeding on aphid**



## BOTTOM LINE

- You must spray for:
  - Weevils
  - Black aphids
  - Shuckworms
- You Might need to treat:
  - Phylloxera
- Almost never:
  - Mites, yellow aphids, nut casebearer



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- *Scout*
- *Know your pest and beneficials*

# INFORMATION ON WHAT TO SPRAY

## MyIPM App



Android

Iphone



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