

Peach Insect Management Update

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Arthropod Pests of Peach

Key Pests

- Scales
- Plant bugs
- Plum Curculio
- Oriental Fruit Moth
- Stink Bugs
- June bugs/Japanese beetles
- Peachtree borer

Sporadic Pests

- Western Flower thrips
- Lesser peachtree borer
- Stem borers
- Leafrollers
- Spider mites

White Peach Scale



White peach scale infests only wood, and leaves a white fluffy appearance,



San Jose Scale



San Jose scale infests both wood and fruit. Infested fruit have a red spot around the scale feeding site



San Jose Scale



Overwinter as immatures on twigs and bark (male oblong).



Winged males emerge and mate with females in early to mid April. Females give birth to live “crawlers.” Females never leave their waxy covering.



When scales feed on fruit, a reddish spot surrounds the feeding site

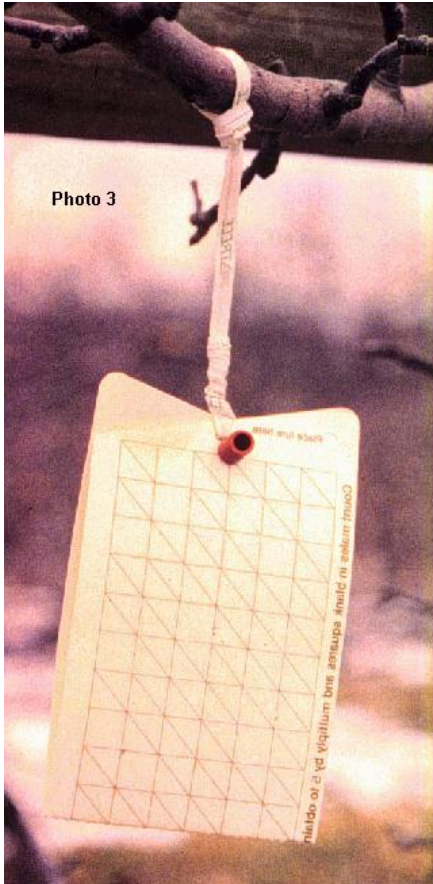


San Jose scale completes 3 to 4 generations in the NC piedmont.



First generation crawlers appear in May. They quickly settle, begin to feed and secrete a waxy scale covering

Scale Monitoring Techniques

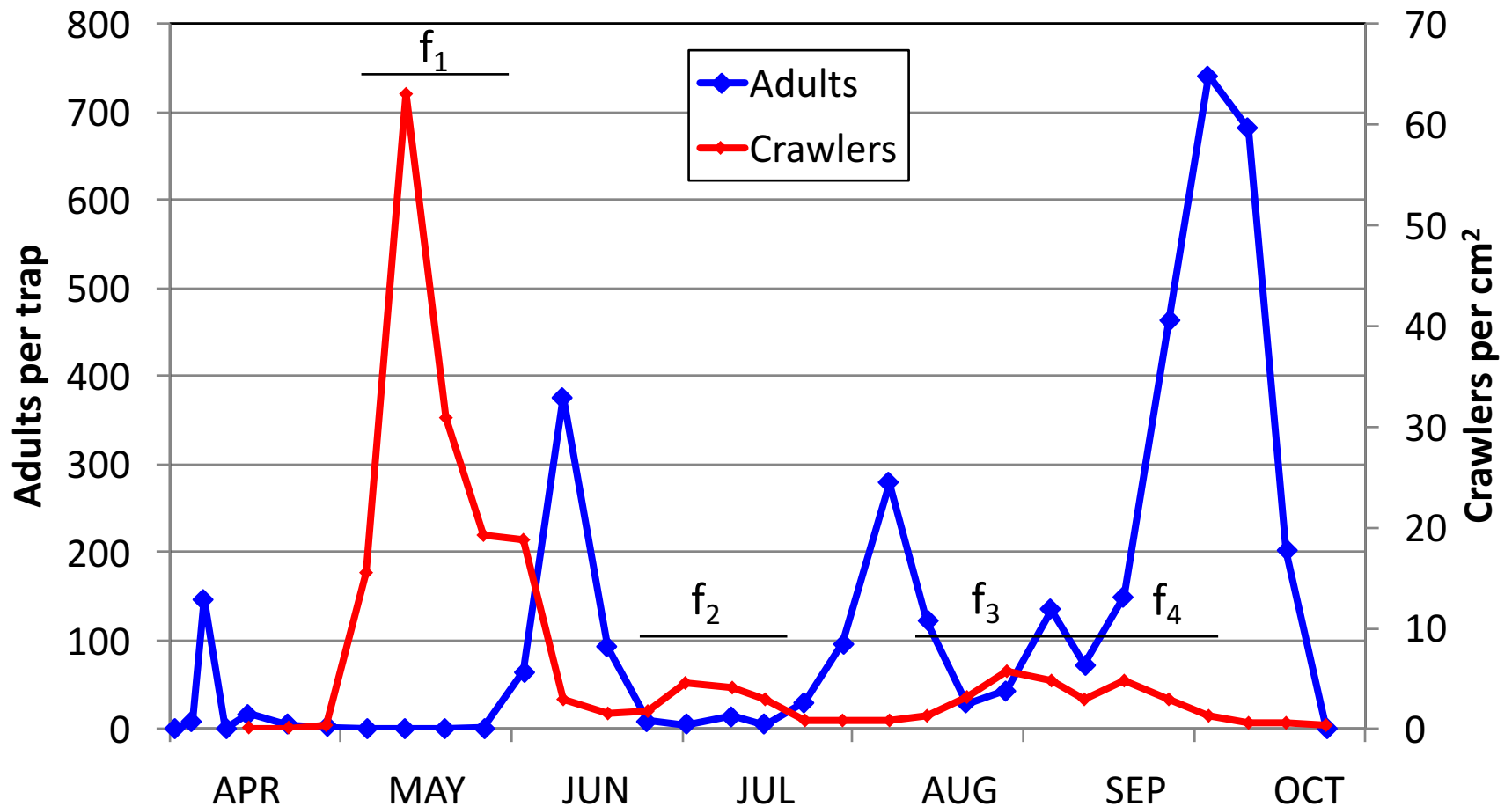


Adult male flight periods can be monitored with pheromone traps (above). Due to small size of scale, traps need to be checked under a microscope.

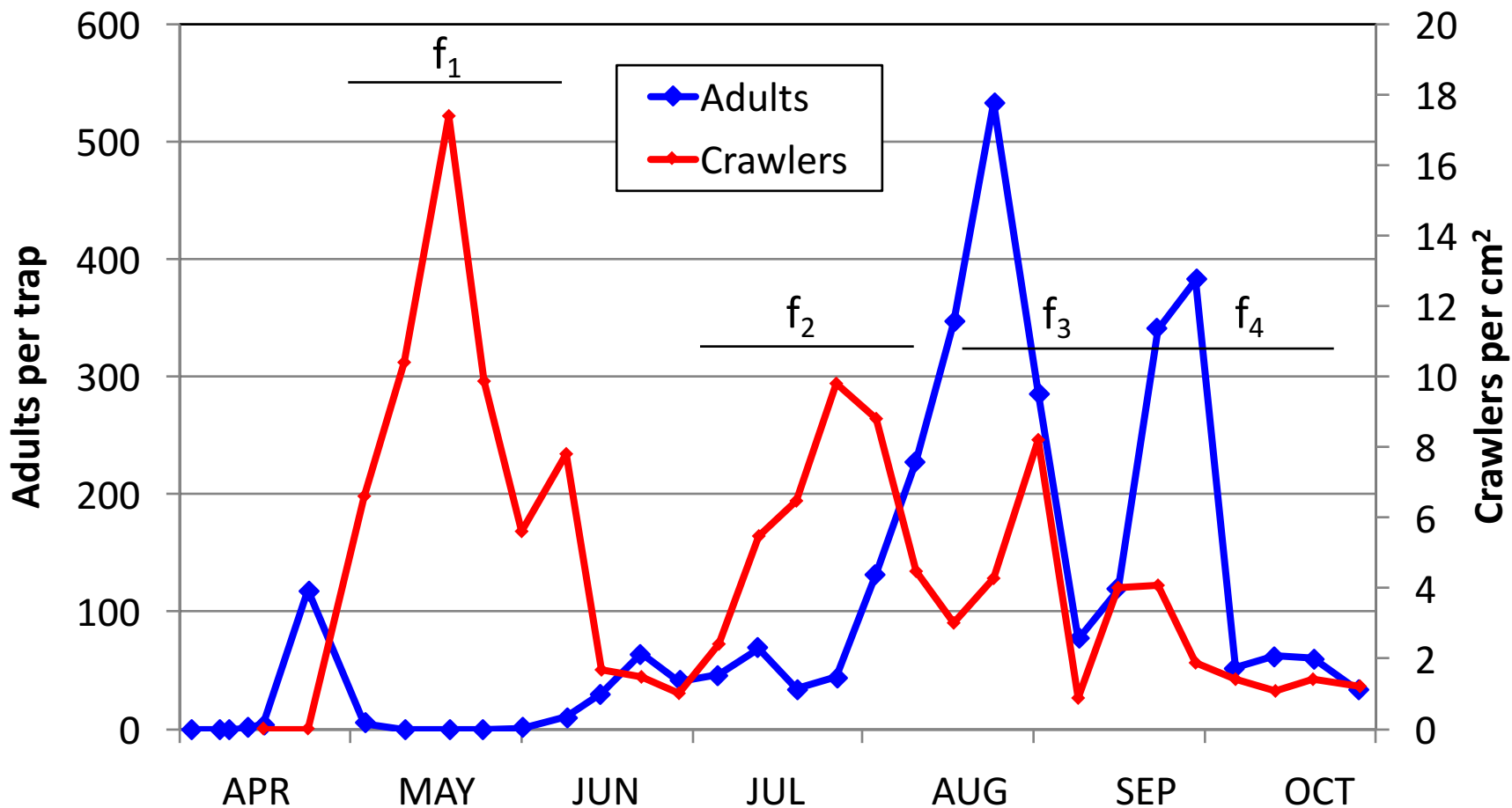


Crawler activity can be monitored by wrapping double-sided sticky tape or electrical tape around twigs of infested trees. A hand lens is often necessary to see crawlers stuck to tape.

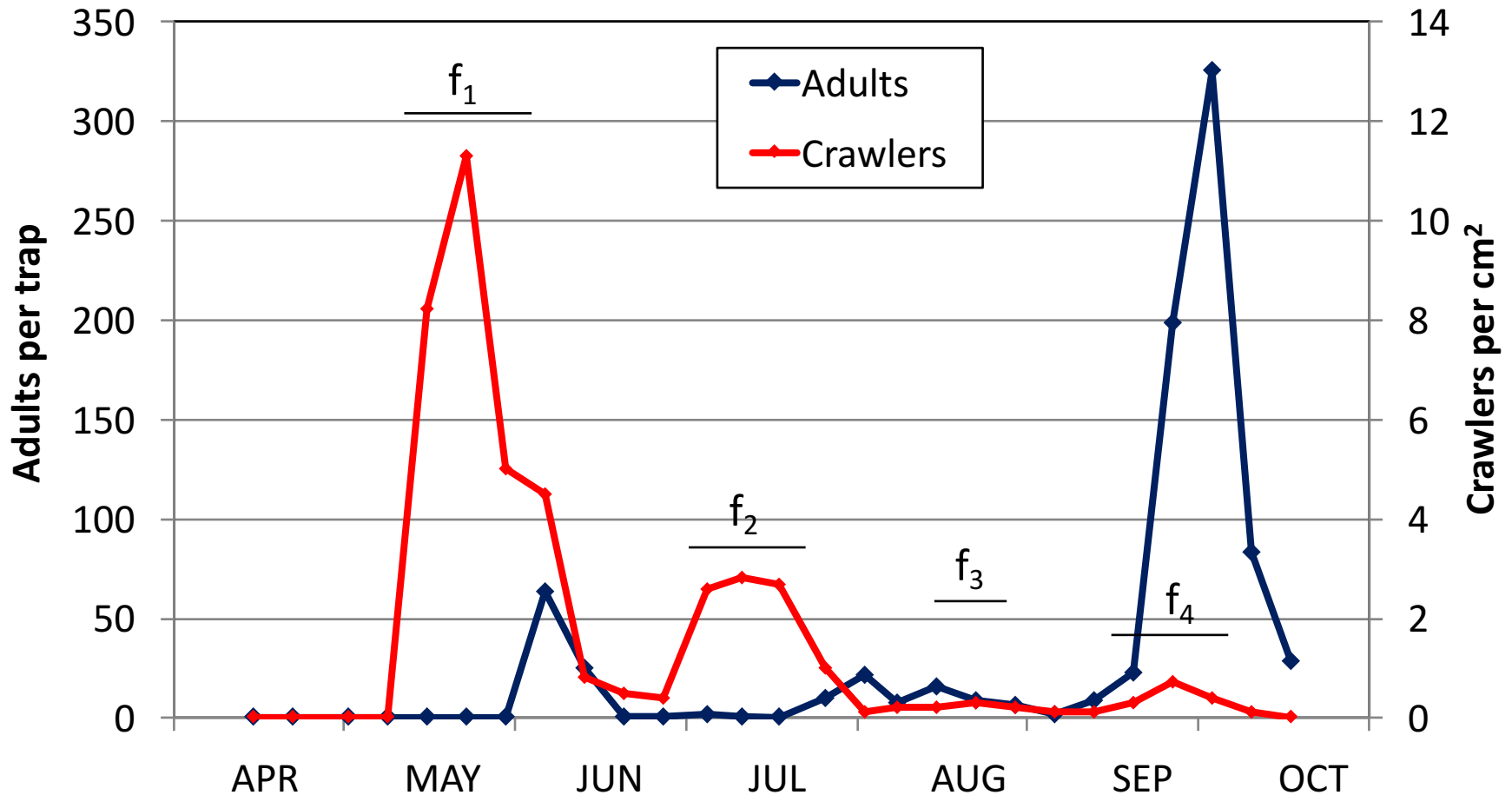
Phenology of San Jose Scale on Non-Sprayed Apples – Clayton, NC 1986



Phenology of San Jose Scale on Non-Sprayed Apples – Clayton, NC 1987



Phenology of San Jose Scale on Non-Sprayed Apples – Jackson Springs, NC 1986



San Jose Scale Insecticide Control Strategy

- Target early season populations, when generations are distinct (not overlapping), and numbers are at their lowest.
- Most vulnerable life stage is crawlers.
- Optimum timing
 - Delayed Dormant (overwintering immatures)
 - Mid to late May (f_1 crawlers) – about 400 DD after pheromone trap capture.

Recommendations for San Jose Scale

* Delayed Dormant *

- Horticultural oil as a delayed dormant application is a standard application for scales in tree fruit production. Oil becomes more toxic to scales as their rate of respiration increases, which occurs as they age. Hence, delay applications to at least bud swell.
- Thorough coverage is critical for an oil application. Because good coverage can be difficult to obtain on older trees, increase gallonage for the oil spray – 150-200 GPA.
- Oils sold today are highly refined and lighter than older “dormant” oils. Potential for phytotoxic effects is very low before bloom.
- Do Not apply a sulfur-containing fungicide within two weeks of an oil application.

Recommendations for San Jose Scale

* Delayed Dormant *

- Insecticide added to oil for Dormant application will improve control.
- Most effective options include:
 - Lorsban 4E (or Advanced) at 2 pt/acre (4-day REI)
 - Diazinon 4E at 1 pt/100 gal (4-day REI)
 - Esteem 35WP at 4-5 oz/acre
 - Centuar 30WDG at 2.15 lbs/acre
- Among these insecticides, Lorsban has the longest residual activity and is preferred at the DD spray.

Recommendations for San Jose Scale

* 1st Generation Crawlers *

- As an alternative to insecticide applied with oil at Dormant or Delayed Dormant, an insecticide targeting first generation crawlers may be applied.
- Based on historical data, first generation crawler emergence starts in late April/early May, but emergence can extend for up to 6 wks. Insecticide timing should target the peak emergence period (2nd or 3rd wk of May).
- If using pheromone traps to monitor SJS males, peak abundance of first crawlers occurs about 350-400 DD (°C) after peak trap capture.

Recommendations for San Jose Scale

* 1st Generation Crawlers *

- Recommendations during the May treatment period include:
 - Esteem 35WP @ 4-5 oz/acre 14-d PHI, 12-h REI
 - Centaur 30WDG @ 2.15 lbs/acre 14-d PHI, 12-h REI
 - *Movento 2SC @ 9 oz/acre 7-d PHI, 24-h REI

*There is less information on the efficacy of Movento compared to other products. Also, Movento must be applied at petal fall to allow for uptake by the time first crawlers are present.

Recommendations for San Jose Scale

* 2nd Generation Crawlers *

- Rarely are insecticides necessary against 2nd gen. crawlers. This application is only necessary when problems persist into July.
- If needed, insecticide timing is early July, or about 500 DD (°C) after peak 1st gen. crawlers – about mid July.
- Insecticides recommended are the same as against 1st gen. crawlers, but for resistance management, use a different product than used against the 1st generation.

San Jose Management Summary

- **February** – Dormant to Delayed Dormant
 - Oil 1-2% Solution
 - Lorsban 4E (or Advanced) – 2 Pts/Acre
- **Early May** – 1st Generation Crawlers
 - Esteem 35WP – 4 oz/Acre
 - Centaur 70WDG – 34.5 oz/Acre

Alternatives to Pyrethroids

- There are numerous insecticide options to pyrethroids for controlling peach insects, but none have the wide spectrum of activity as pyrethroids.
- Knowledge of the pest complex in the orchard is important to match the proper insecticide with the pest.
- Mating disruption of OFM is an option. It is easy, provides season-long control, and virtually eliminates that pest as a concern.

Key Insect Pests of NC Peaches

	DD	PF - SF	MAY	JUN	JUL	AUG
W. peach scale	X					
S. Jose scale	X		X			
Plant bugs		X				
Plum Curculio		X		X	X	
OFM		X	X	X	X	X
Jap. Beetles				X	X	
June bugs				X	X	
Stink bugs					X	X



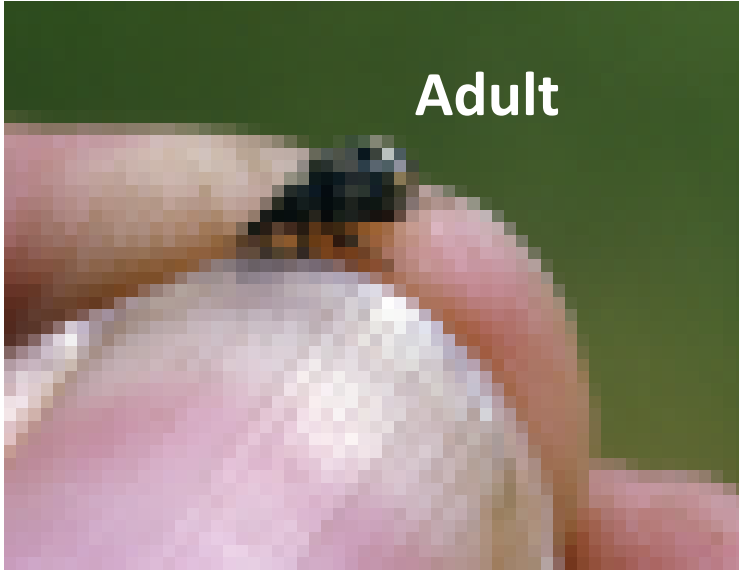
Plant bugs enter orchards in the early spring shortly before bloom. They are attracted to flowers of broadleaf weeds.

Maintaining clean ground cover is the most effective control strategy.



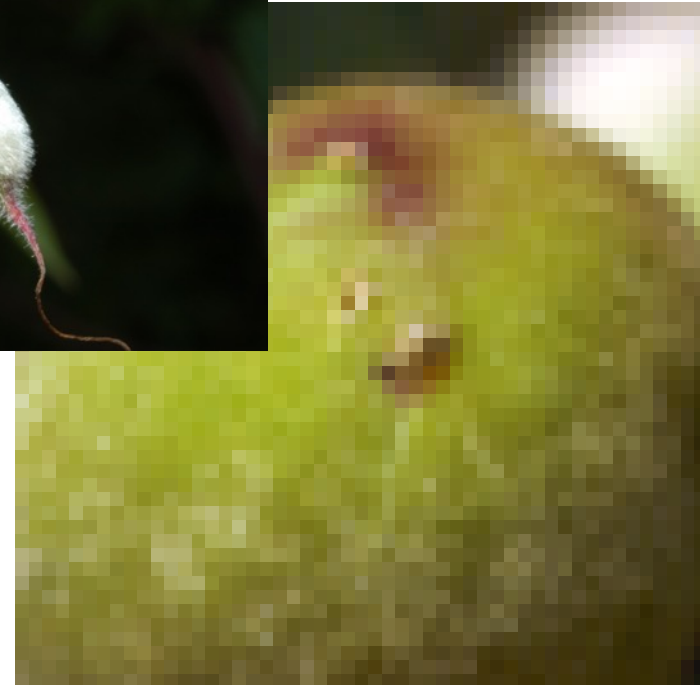
Plum Curculio

Adult



- Overwinter as adults in hedgerows, Woods, and trashy fields.
- Most active for 2-3 wks after first warm period after petal fall

Larva



Non-Pyrethroid Options for Peach Insect Control

E = Excellent G = Good F = Fair — no activity

	PHI	REI	Scales	Plant bug	Plum Curc.	OFM	Jap. beetle	Stink bug
Actara	14 d	12 h	G	E	E	F	E	G
Assail	12 d	12 h	G	G	G	G	E	G
Belay	21 d	12 h	G	E	E	F	E	G
Provado	0	12 h	F	—	—	—	E	—
Avaunt	14 d	12 h	—	—	E	E	F	—
Imidan	14 d	3 d	F	F	E	E	E	F
Altacor	10 d	4 h	—	—	F	E	—	—
Delegate	7 d	4 h	—	—	F	E	—	—

OFM Mating Disruption Options



**Isomate OFM TT
(50-75 per acre)**



**CheckMate OFM F
(1-1.3 oz/A)**



**CheckMate OFM
(100 per acre)**



**CideTrak OFM
(100 per acre)**



**CheckMate Puffer OFM
(1 puffer/acre)**

OFM Mating Disruption Options

- Dispensers should be hung before flight of OFM, which begins about when peaches bloom.
- Hand applied pheromone dispensers (180+ days activity)
 - Isomate OFM TT (50 to 75 dispensers/A)
 - CheckMate OFM (100 dispensers/A)
 - Trece CideTrak OFM (100 dispensers/A)
- Puffers (180+ days)
 - CheckMate Puffer OFM (1 puffer/acre)
- Sprayable pheromone (3-4 wks residual activity)
 - CheckMate OFM-F (1 oz/A @ 3-4wk intervals)

Green Stink Bug



Brown Stink Bug



Brown Marmorated
Stink Bug



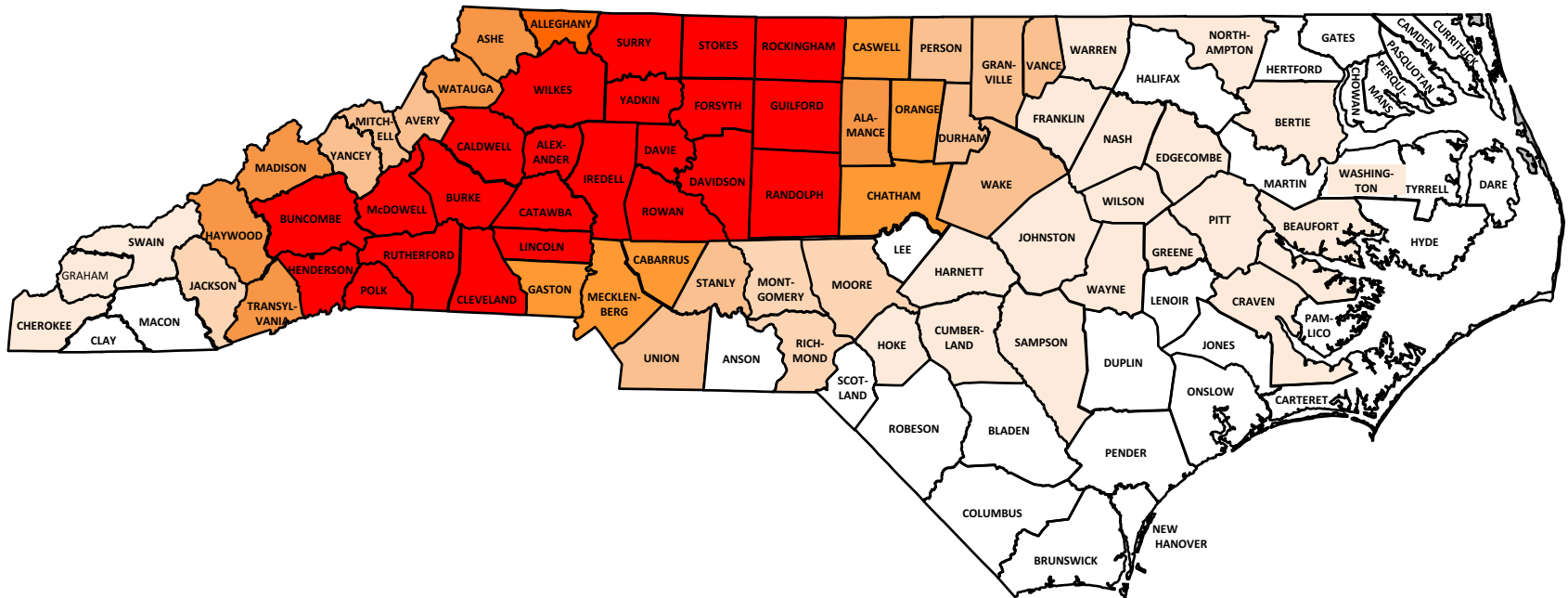
Brown Marmorated Stink Bug



Brown Marmorated Stink Bug

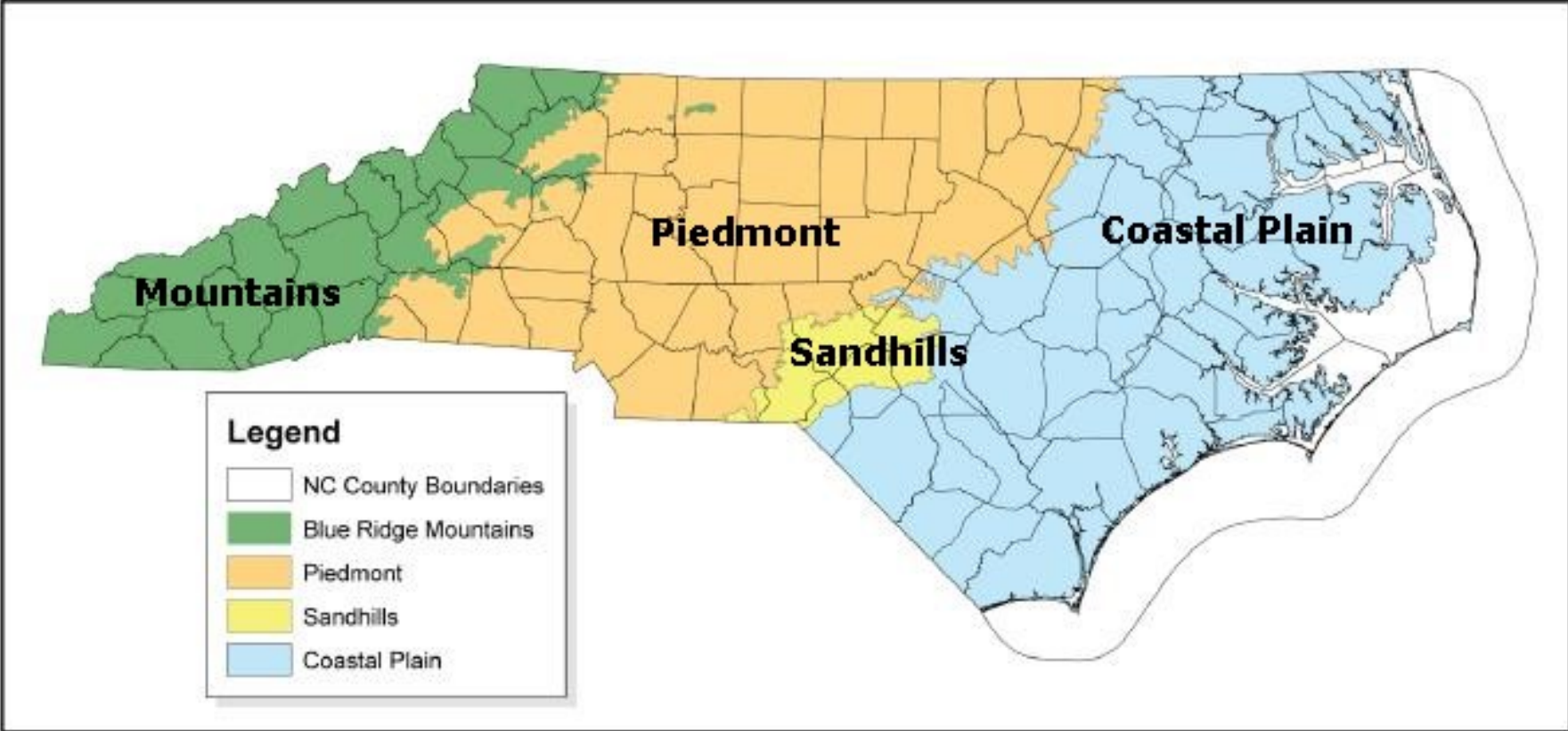
- Invasive pest native to Asia
 - China, Korea, Japan
- First detected in Allentown, PA, in late 1990s.
- Wide host range including most tree fruits, many nut and vegetable crops.
- Only stink bug that overwinters in man-made buildings.

Intensity of Brown Marmorated Stink Bug Populations in NC



- Widespread agricultural and nuisance pest.
- Locally intense agricultural and nuisance pest.
- Local hotspots in residential areas.
- Low level populations in isolated areas.

North Carolina Ecoregions



Summary

- San Jose Scale
 - Delayed Dormant Oil + Lorsban, or
 - Early to mid May Esteem or Centaur
- Alternatives to pyrethroids
 - Imidan and neonicotinoids
 - Mating disruption for OFM
- Stink Bugs
 - July through September are key periods
 - Pyrethroids
 - Mixtures (Endigo)