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4-28-2021

## **2021 Pesticide Safety April 28: The New Problems Ruining Our Day (bugs)!**

Martha Sylvia

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# The New Problems Ruining Our Day (bugs!)

UMass Cranberry Station

Marty Sylvia

4/28/2021



UMass  
Extension





# The New Problems Ruining Our Day (bugs!)

## New(ish)

- Casebearer
- Fire Beetle
- Leafhopper



- Old(ish)
- BHF
- Winter moth
- Green spanworm
- Scale





# Lesser Cranberry Insect Pests

- Golden Case Bearer, *Triachus vacuus*  
(Coleoptera: Chrysomelidae)
- Fire Beetle, *Cryptocephalus incertus*  
(Coleoptera: Chrysomelidae)
- Striped colaspis, *Colaspis costipennis*  
(Coleoptera: Chrysomelidae)
- Cranberry Rootworm, *Rhabdopterus picipes*  
(Coleoptera: Chrysomelidae)
- Blunt-nosed leafhopper, *Limotettix vaccinii*  
(Homoptera:Cicadellidae)
- Putnam scale, *Daispidiotus ancylus* (Hemiptera)
- Dearness scale, *Rhizaspidiotus dearnessi* (Hemiptera)
- Latania scale, *Hemiberlesia lataniae* (Hemiptera)



# Golden Chrysomelid, Golden Case Bearer, *Triachus vacuus*

- a new pest, a leaf beetle
- a case-bearing beetle
- **Order Coleoptera** (Beetles)
- **Family Chrysomelid** (Leaf Beetles)
- **Subfamily Cryptocephalinae**  
**(Case-bearing beetles)**
  - ~350 species in our area
  - 4 *triachus* sp in US
  - Biology poorly known
- **Genus Triachus**



Other Chrysomelids in Cranberry  
Cranberry Rootworm  
Striped Colaspis  
Fire Beetle



The cranberry rootworm beetle.



Photo by S. B. Bambara, NC State University



Fire beetle adult.



# Identification through USDA

- Send to Smithsonian for ID
- *Triachus vacuus*
- Poorly studied chrysomelid
- A few specimens from AL MD, NJ VA and WV and MA **cranberry** from 1960's



control number for this information collection is 0379-0377. The time required to complete this information collection is estimated to average .25 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

UNITED STATES DEPARTMENT OF AGRICULTURE  
ANIMAL AND PLANT HEALTH INSPECTION SERVICE

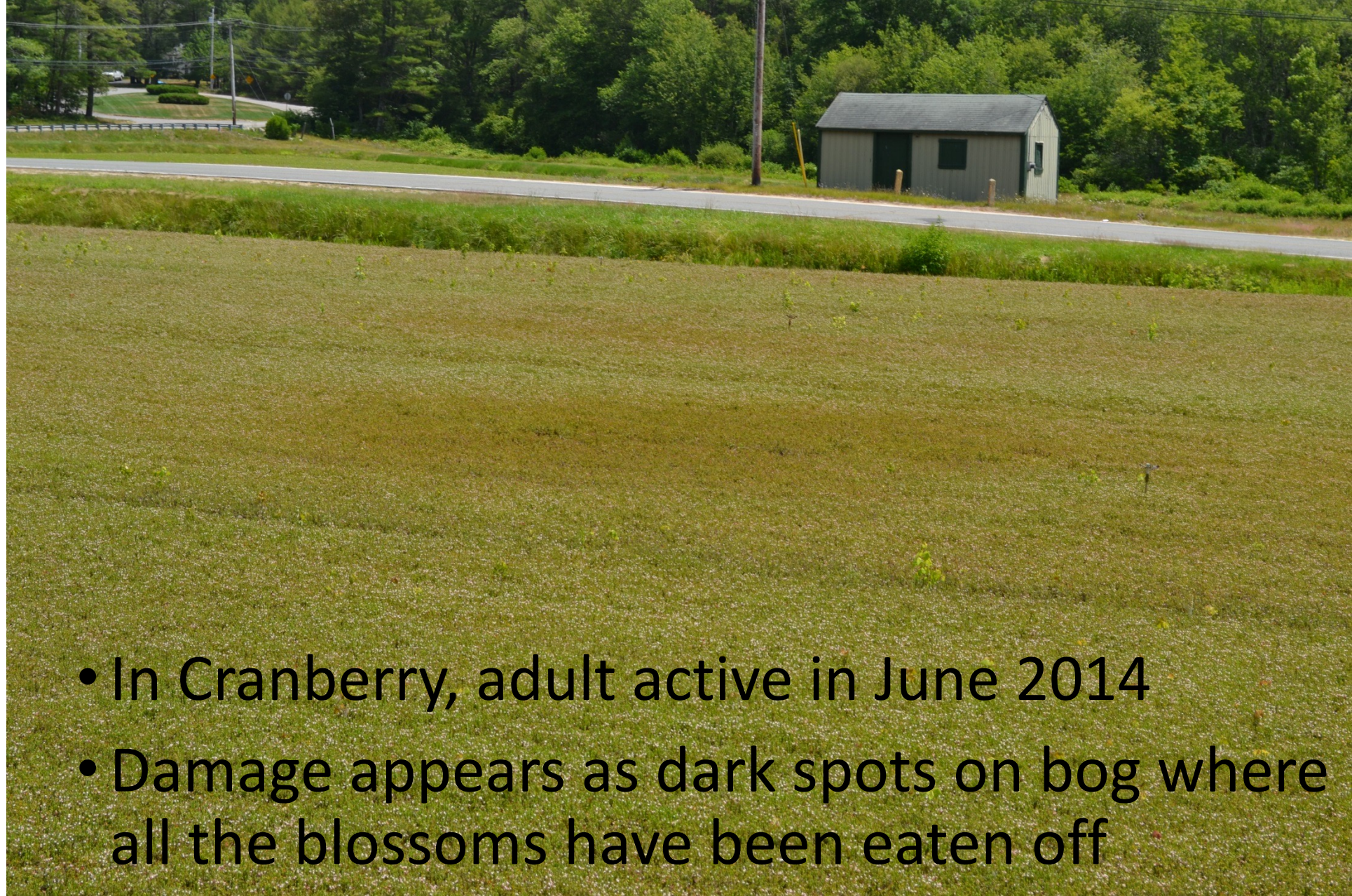
**SPECIMENS FOR DETERMINATION**

Instructions: Type information requested. Block 1 – assign a number for each collection using your own numbering convention or use the following example by beginning with the year, followed by the collector's initials and the collector's number. Example: 14-JJD-001.

Pest Data Section – Complete Blocks 14, 15 and 16. Complete Items 17 and 18 if a trap was used.

COLLECTION NUMBER		2A. DATE - SUBMISSION			2.B. DATE - COLLECTION			3. SUBMITTING AGENCY		
		MONTH	DAY	YEAR	MONTH	DAY	YEAR	<input type="checkbox"/> State Cooperator	<input type="checkbox"/> University	
								<input type="checkbox"/> Other:		
SUBMITTER AND ORIGIN	4A. NAME OF SUBMITTER				4B. NAME OF COLLECTOR			6. TYPE OF PROPERTY (FARM, RESIDENCE, NURSERY, etc.)		
	5. ADDRESS							7. NAME AND ADDRESS OF PROPERTY OWNER		
	EMAIL ADDRESS OF SUBMITTER							CITY	COUNTY	
PURPOSE	8. REASON FOR SUBMISSION (X all that apply)									
	A.	Biological Control				E.	Export Certification			
	B.	Damage to Crops/Plants				F.	Targeted Survey (Pest Name)			
	C.	Suspected Pest	(Explain in REMARKS)			G.	Smuggling Interdiction/Trade			
	D.	Stored Product Pest				H.	Other (Explain in REMARKS)			
DATA	9. IF PROMPT OR IMMEDIATE IDENTIFICATION IS REQUESTED				A BRIEF EXPLANATION UNDER "REMARKS".					
	10. HOST INFORMATION				11. QUANTITY OF HOST					
	NAME OF HOST (Scientific name and name of cultivar if appropriate)				NUMBER OF ACRES/PLANTS					
12. PLANT DISTRIBUTION				13. PLANT PARTS AFFECTED						
				<input type="checkbox"/> Leaves Upper Surface <input type="checkbox"/> Trunk/Bark <input type="checkbox"/> Bulbs, Tubers, Corms						





- In Cranberry, adult active in June 2014
- Damage appears as dark spots on bog where all the blossoms have been eaten off
- 2 reports from Carver, first week of July



- 2014, 2015, 2018 - 1 – 2 cases each year – South Carver
- 2020 – Now 10+ cases - Carver Carver Carver  
Plympton Middleboro Taunton and RI!!!



Golden case bearer







- The damaged areas ranged from 3 to 20 feet around.
- Each site had multiple large dark areas that were readily apparent on the bog.





Tiny beetle,  
big damage

About 1 mm or  
 $1/16^{\text{th}}$  of an inch



- The tips of the uprights had been fed upon and other tips had been girdled.
- Spots generally were about the size of a truck, with damage to the tips, flowers and foliage.







2020  
Diazinon  
or Actara



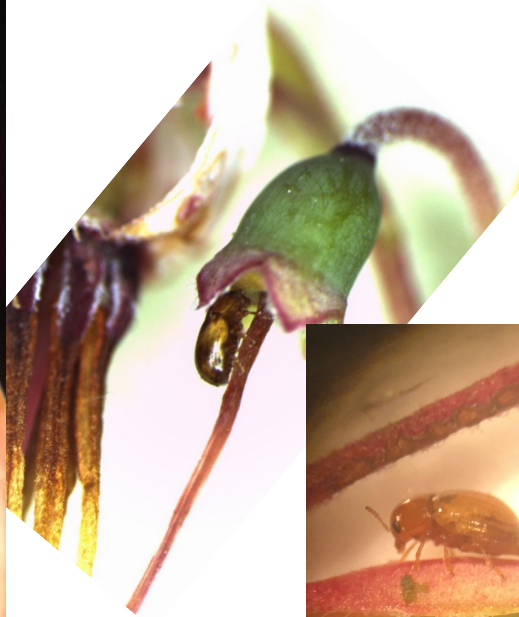
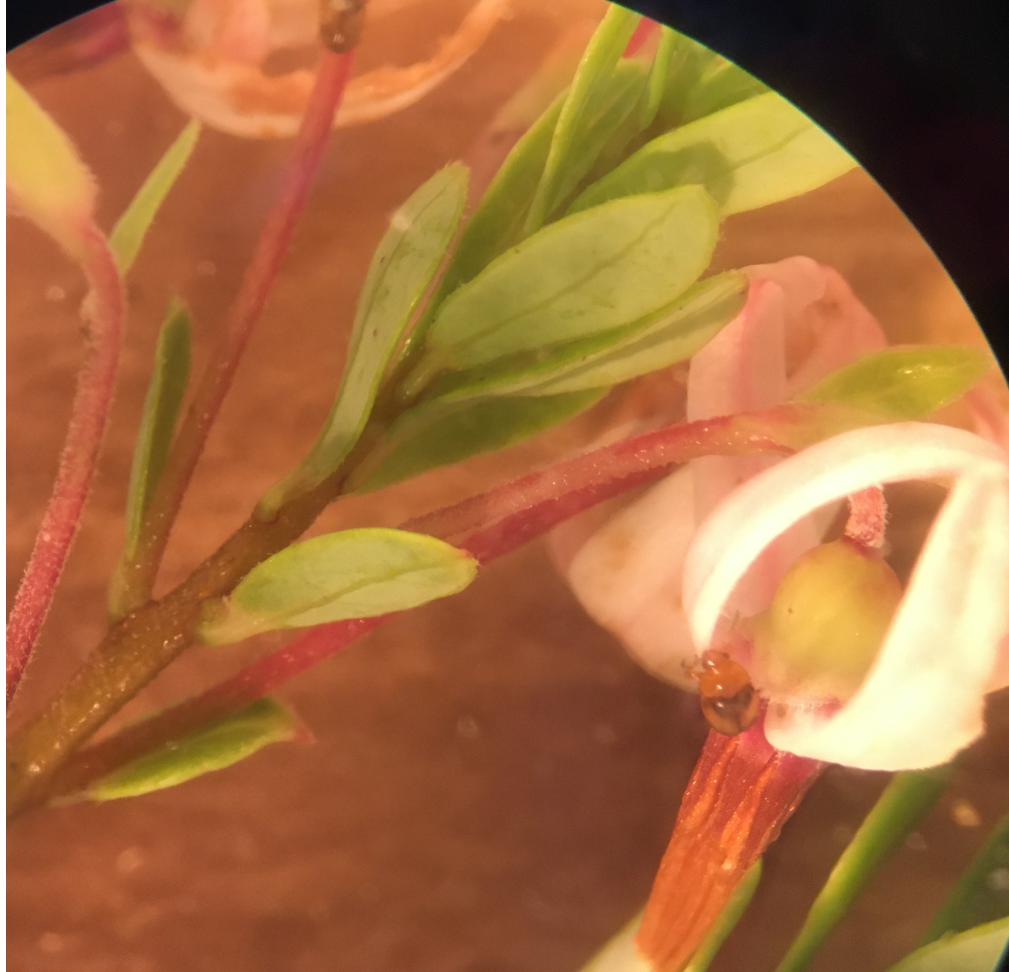


- The adult beetle is targeted for management. The timing is difficult as the beetles and their damage appear in the 1<sup>st</sup> week of July, just as most cranberry is in full bloom.

- Diazinon and Actara both work well to manage the beetle but CANNOT be applied when bees are working the bogs and there is bloom present.







## **Fire Beetle**

Eggs overwinter

## **Rootworm and Striped Colaspis**

Nearly mature larvae overwinter in earthen cells in bog soil

Striped Colaspis

- We know the beetles must be active in June since damage is massive when finally detected on bog in early July
- Don't know how Golden Case-bearer overwinters (larva, pupa, or adult)
- Previous infestations were treated and did not reoccur on same bog



# Mating on the bog in July



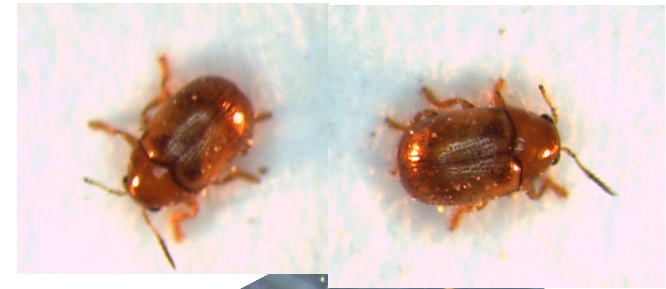


# Cryptocephalus (Hidden Head)

Subfamily Cryptocephalinae – Case-bearing Leaf Beetles



- female of *Cryptocephalus species* in the act of producing the pot by layering feces over the egg
- Mother coats eggs with excrement (called a pot), and they are stuck onto stem and very hard to see



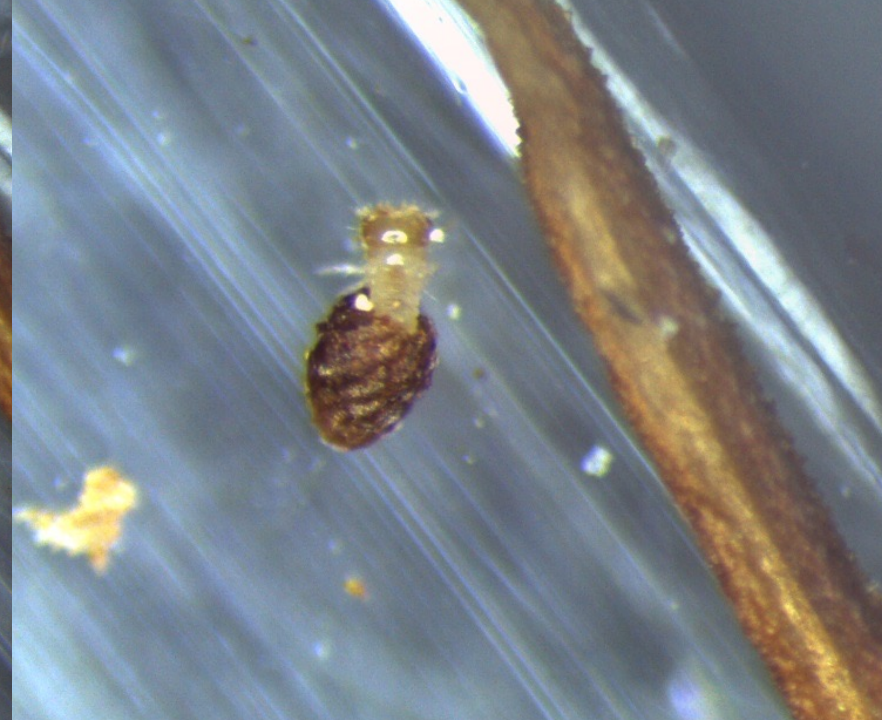
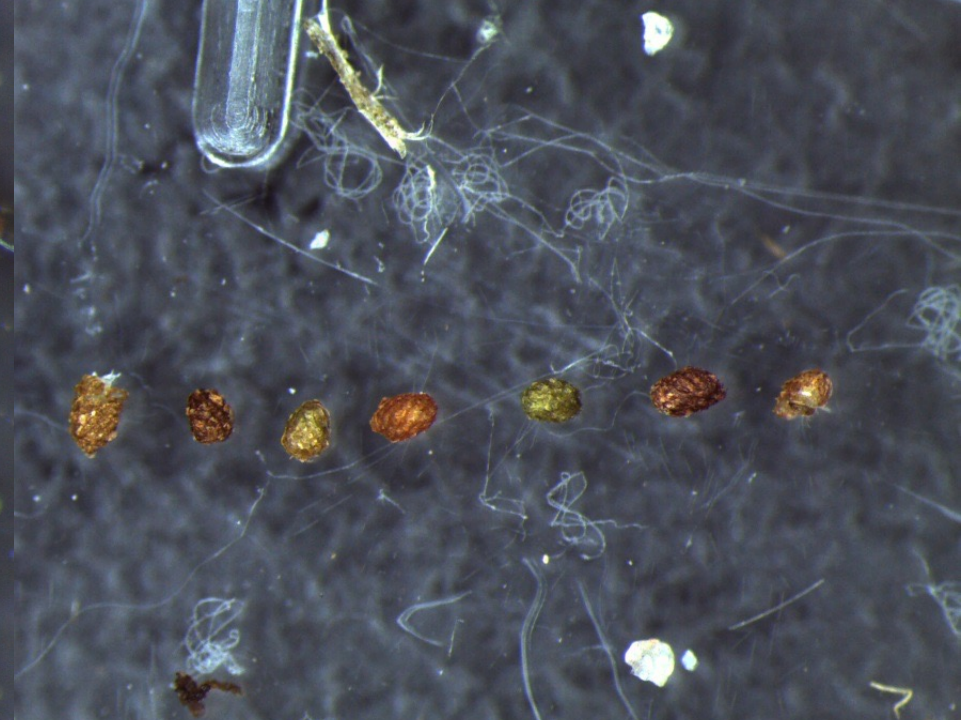
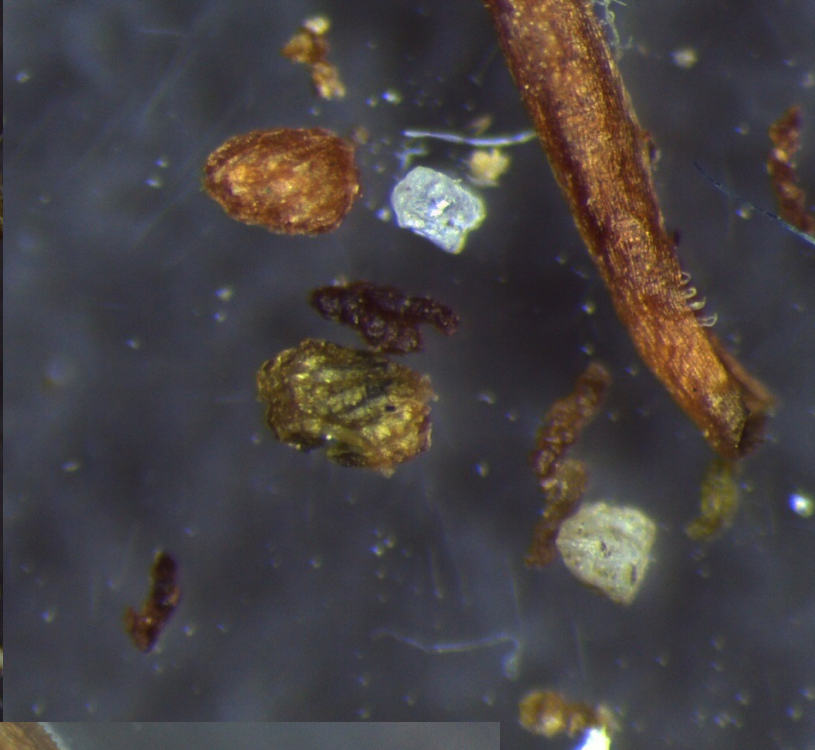
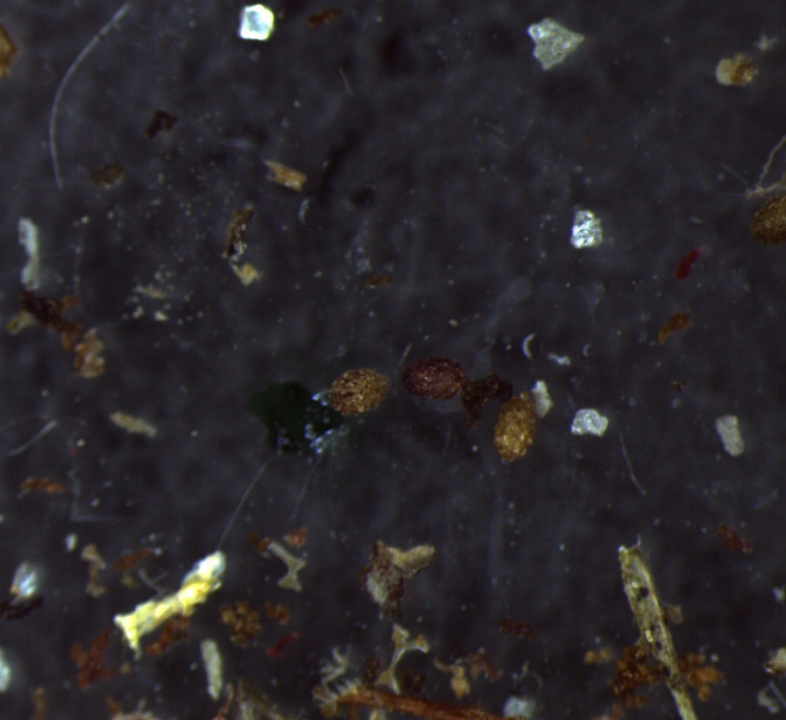
- Eggs are laid in carefully sculpted packets formed from feces and abdominal secretions
- Larvae are casebearers, living in and protected by a case constructed of their fecal matter and sometimes plant debris
- Larvae live in litter on soil surface or on the leaves of host plant (they drop to the ground when threatened)
- The case is shorter than the larva that remains folded inside it.

Info from



on the internet







# Fire Beetle

*Cryptocephalus incertus*

Eggs hatch late May

Crawl around with their pots

Beetles active in August



Fire beetle adult.



Leaf feeding by fire beetle is similar to flea beetle, but fire beetle feeds on both sides of the leaf.







# Fire Beetle Damage









# POLLING QUESTIONS - Scale and Casebearer

## Scale, Which is most true for you?

- I see scale damage every year
- I had scale in the past and it is gone
- I have never seen scale
- I don't know
- Not applicable to me

## Golden Casebearer, Which is most true for you?

- I had golden casebearer in the last few years
- I will be looking for golden casebearer this year
- I have never seen golden casebearer
- I don't know
- Not applicable to me



# Blunt-nosed Leafhopper



- Lots of sharp-nosed leafhoppers on bogs
- Organic bog with damage from spring nymphs
- A few found in sweeps every year
- Often present at high numbers at wild bogs



sharp-nosed leafhoppers



# False blossom disease

Phytoplasma vectored by  
the blunt-nosed leafhopper





# Leafhoppers

(sharpshooters, Hoppers, cicadellids)

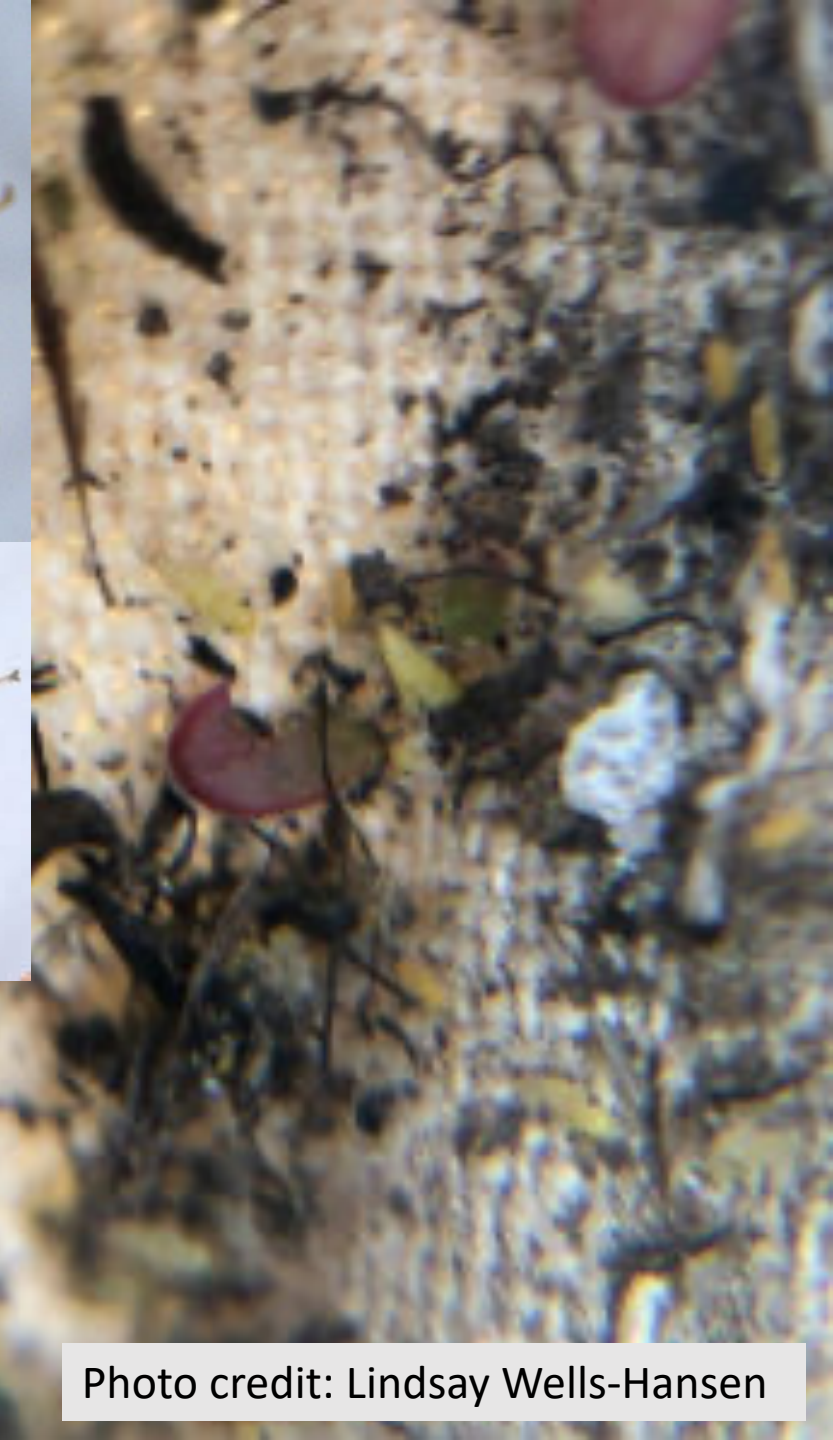
- Leafhoppers are a large and diverse family of sap-sucking, hopping insects
- In the family Cicadellidae
- In the order Hemiptera (the true bugs)
- 3000 species in North America (N of Mexico)
- Most species are less than about ½ inch (13 mm)
- Similar to treehoppers, planthoppers, or spittlebugs/froghoppers but different
- Mouthparts arranged into a tube, which they insert into a plant leaf or stem and then use to suck plant fluids
- The vast majority of leafhoppers are not pests!





# Blunt-Nosed Leafhopper nymphs to adults

- one generation a year
- overwinter as eggs
- hatch in early May
- five instars (or sizes as they grow)
- adults by end of June, early July



- adults have a characteristic blunt head
- Adults vary from light yellowish-gray to dark brown
- Eggs are laid in August-September



# Blunt-Nosed Leafhopper nymphs to adults



- Nymphs and adults get their food by sucking the plant juices of the cranberry with their piercing-sucking mouthparts
- This direct injury is, however, not noticeable...
- most of the feeding is done throughout the nymphal stages



Photo credit: Lindsay Wells-Hansen



# Blunt-Nosed Leafhopper nymphs to adults

- Nymphs and adults get their food by sucking the plant juices of the cranberry with their piercing-sucking mouthparts
- This direct injury is, however, not noticeable...



- most of the feeding is done throughout the nymphal stages
  - Target nymphs with OP's or Sevin
- 
- 100-200 leafhoppers per sweep set high
  - 10-20 leafhoppers per sweep is considered low





# Blunt-Nosed Leafhopper NYMPHS

- Wingless
- five instars in 1–2 months
- Whitish 1/5 mm
- Yellow, blackish greenish-gray



*Photos by Charles Armstrong*

Photo credit: Lindsay Wells-Hansen



# Nymphs

- Cannot tell which species they are when they are nymphs
- Takes dissection to identify to species

Blunt-nosed leafhopper -  
*Limotettix vaccinii* (Van Duzee)

**Nymph**, in entomology, sexually immature form usually similar to the [adult](#) and found in such insects as grasshoppers and cockroaches, which have incomplete [metamorphosis](#). Wings, if present, develop from external wing buds after the first few molts. The body proportions of the first nymphal stages are quite different from those of the adult. During each successive growing stage (instar) the [nymph](#) begins to resemble the adult more closely. (Britannica definition)



Nymphal stages of leafhopper  
But not blunt-nosed leafhopper



credit: Lindsay Wells-Hansen



# Sharp Nosed Leafhoppers VS Blunt Nosed Leafhopper

blunt nosed

Not blunt nosed

*Photo by Charles Armstrong*





# Sharp Nosed Leafhoppers VS Blunt Nosed Leafhopper

blunt nosed



Not blunt nosed



*Photo by Charles Armstrong*



# False Blossom and Blunt Nosed Leafhopper



Photo credit: Dan Schiffhauer



Flowers are abnormal, with erect rather than arching pedicels (flower stem). Petals can be dark pink or streaked with pink and stunted. Photo by Lindsay Wells-Hansen.

Witch's  
Broom





WISCONSIN!!

Fruit Growers News

MAR 29, 2021

## Researchers ponder presence of cranberry false blossom

✉ f t Cranberry growers are seeing a reemergence of a disease that was a serious problem in the early 1900s but rarely observed after about 1940. Cranberry false blossom nearly decimated cranberry production in some U.S. cranberry growing areas until the introduction of resistant cranberry varieties and broad-spectrum insecticides curtailed the incidence of the disease.



*Instead of pale pink blossoms, cranberry vines infected with cranberry false blossom have dark pink petals and upright pedicels or flower stalks. The disease causes flowers to abort in the year symptoms appear and continues to reduce bloom in following years. Photo: Ocean Spray Cranberries Inc.*

vines are infected. Typically the infection occurs in scattered areas of a cranberry bed. Holland's advice to cranberry growers is to dig out the infected vines, including the roots.

Diseased vines tend to extend above the plant canopy and turn red prematurely in the fall. Infected vines may have smaller leaves folded close to the stems. The stems also are often closely spaced creating a "witch's broom" appearance (pictured at top), Holland said.

Because cranberry false blossom persists in plants from year to year, the disease can be introduced into new locations via vine cuttings or plugs used for propagating new cranberry plantings.

There is no control for cranberry false blossom once



New occurrences of cranberry false blossom were first reported in New Jersey in the late 1990s, followed by Massachusetts in 2017 and Wisconsin in 2018, according to University of Wisconsin–Extension fruit pathologist Leslie Holland.

Holland discussed the reemerging disease during the 2021 Wisconsin State Cranberry Growers Association annual winter meeting. Due to COVID-19, this year’s meeting and trade show were held virtually Jan. 27–28.

Cranberry false blossom disease is caused by a phytoplasma, a single-celled microorganism that lives in the phloem or sugar-conducting tissue of plants.



*Leslie Holland*





Patti McManus  
Wisconsin  
2019



A4169

# CRANBERRY False Blossom

Patricia S. McManus



False blossom results in yield loss by causing flowers to abort in the year that symptoms appear and by reducing or eliminating bloom in subsequent years.

Infected vines do not recover; once infected, they remain diseased and do not bear fruit.

Cranberry false blossom was a limiting factor in cranberry production in Massachusetts, New Jersey, and Wisconsin in the early 1900s until about 1940. It was rarely seen in the second half of the twentieth century, but it reemerged in the early 2000s in New Jersey and in the 2010s in Massachusetts and Wisconsin. False blossom has been observed on the cultivated large American cranberry (*Vaccinium macrocarpon*) and the small cranberry (*V. oxycoccus*). False blossom results in yield loss by causing flowers to abort in the year that symptoms appear and by reducing or eliminating bloom in subsequent years. Infected vines do not recover; once infected, they remain diseased and do not bear fruit.

False blossom is caused by a **phytoplasma**, which is a single-celled microorganism similar to a bacterium but lacks a cell wall. Phytoplasmas infect a wide range of

plants and live in the phloem, the sugar-conducting tissue of plants. There are at least two genetically distinct phytoplasmas associated with false blossom. It is not known if other plants, such as weeds, harbor the phytoplasmas that infect cranberry.

## Symptoms

Cranberry false blossom exhibits various symptoms, but they are not all necessarily observed on infected plants. Flower parts are dark pink or streaked with red and are borne on erect rather than arched pedicels (flower stalks) (figures 1A and 1B). The stamens (male flower parts) and pistils (female flower parts) are abnormal in form and color, or stamens may be absent (figure 1A). In some cases, pistils are retained after petals drop (figure 1C). Berries either abort or are small, green, and misshapen (figure 1D).





Putnam damage  
on the bog

Summer damage  
Awesome infestations

# Putnam Scale



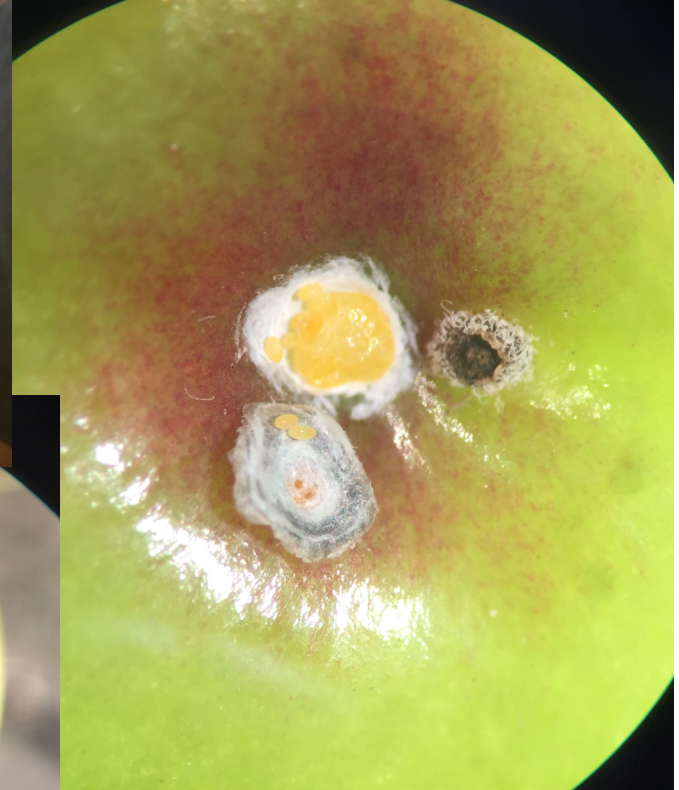


- Putnam scale
- on leaves
- Summer damage
- Awesome infestations

# Putnam Scale

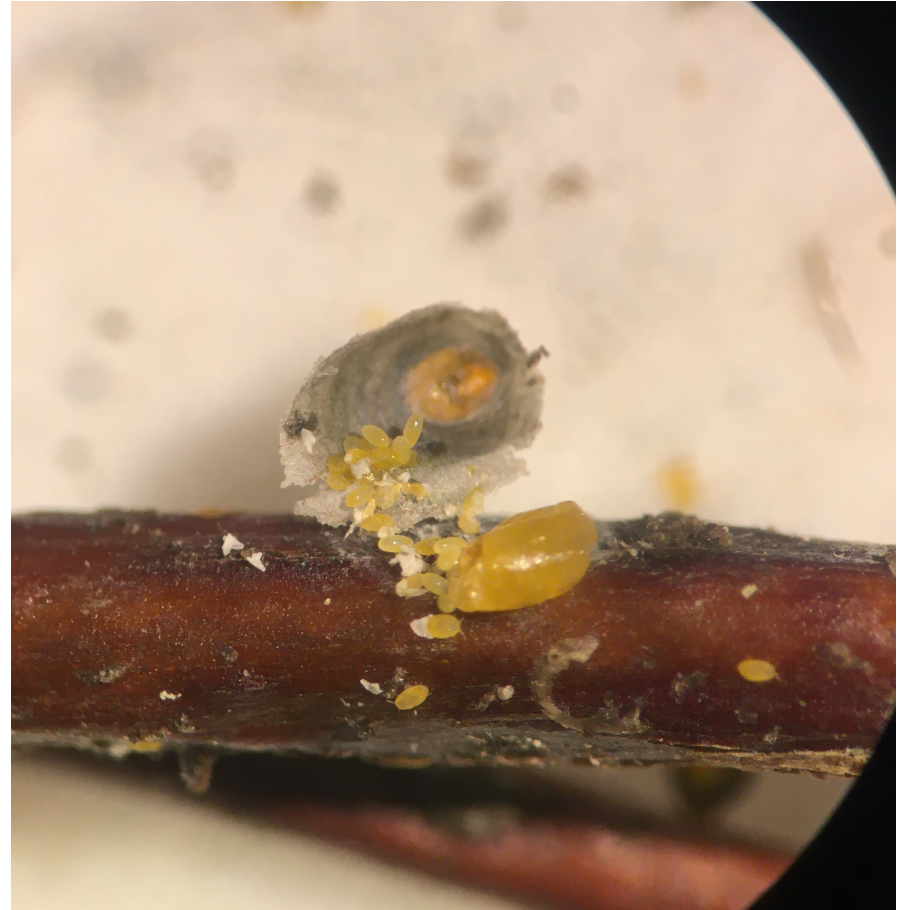


2<sup>nd</sup> generation  
unchecked!!  
Scale on the berries





Putnam Scale - Now over 60 sites across industry  
now, managed with well timed Diazinon or late water





# Eggs produced in spring

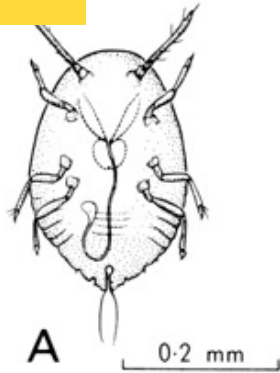


- Females will start feeding in early spring and start producing eggs
- These eggs hatch into tiny mobile crawlers which migrate to new feeding sites in June
- **Second generation of crawlers released mid August**



# TARGET: Crawlers, the mobile/dispersing stage

**crawler**





Females are sealed to vine.

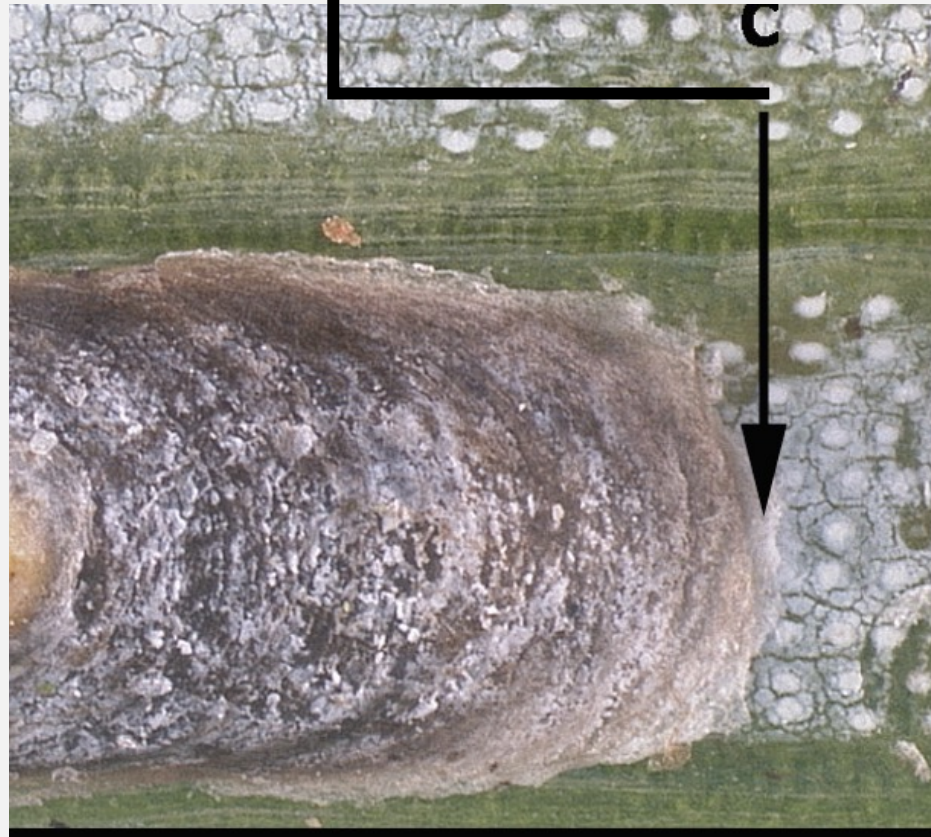
Female will form a 'crawler flap.'

Exiting crawlers can break seal with the stem.

Chemigation treatment hits crawlers before white cap formation and seeps under cover, killing females

Only current management options:

- Diazinon @ June 15<sup>th</sup>
- Late Water



Yes we tried green chemistries with little to no luck



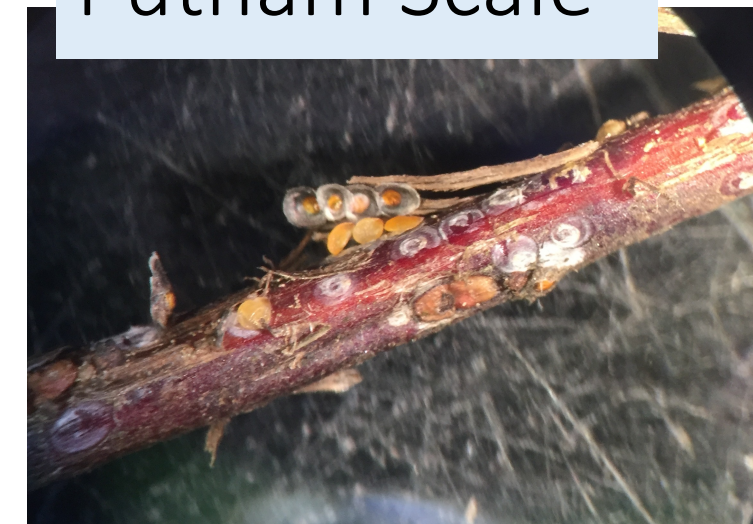
Lecanium Scale



Latania Scale



Putnam Scale



Dearnass Scale





Scale in the field  
really hard to see







If you see dead spots, don't wait, find out if they are scale and be ready to treat!







Take at least  
20+ uprights,  
collect near  
base, getting  
old wood  
around dead  
area but Not  
dead uprights

**Alert  
Marty:  
leave  
sample at  
front door  
of Station  
lab building  
(I'll leave a  
cooler out!)**



# Planning for scale management

- June 15-ish onset of treatment window
- Diazinon application targets crawler stage just before onset of bloom
- Observe rigorous label rules that aim to eliminate applicator exposure to Diazinon

Diazinon AG500





# Questions?

Get out there and sweep  
(next week?!)

