

Vine Mealybug: Managing a Key Grape Pest



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Cooperative Extension**



Mealybug Species



Vine Mealybug



Longtailed Mealybug



Grape and Obscure Mealybugs



Pink Hibiscus Mealybug



Gills Mealybug

David Haviland



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- Information systems
- Research
- Administration

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degree-days

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Grape mealybug



Vine mealybug

Leaf Roll Virus Symptoms on Red-Fruited Grapes

- Red leaves in fall
- “Rolled under” leaves



A close-up photograph of two Vine Mealybugs on a green leaf. The mealybugs are white, oval-shaped, and covered in a fine, waxy scale. They are positioned in the center of the frame, with one slightly above and to the left of the other. The leaf surface is green and textured, with some small, dark spots visible.

Vine Mealybug

**An Invasive Exotic Pest of
Grapes in California**

Vine mealybug Distribution

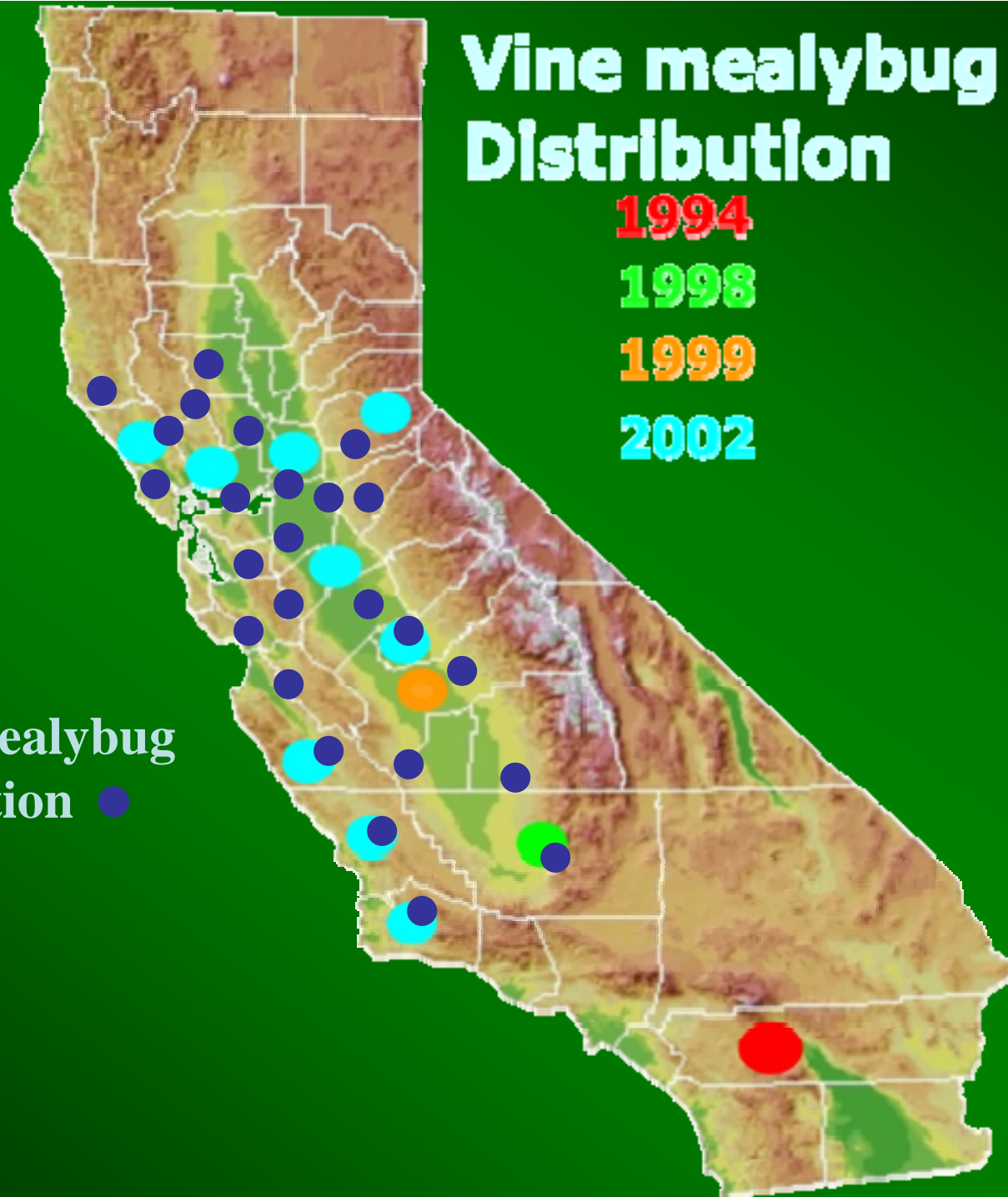
1994

1998

1999

2002

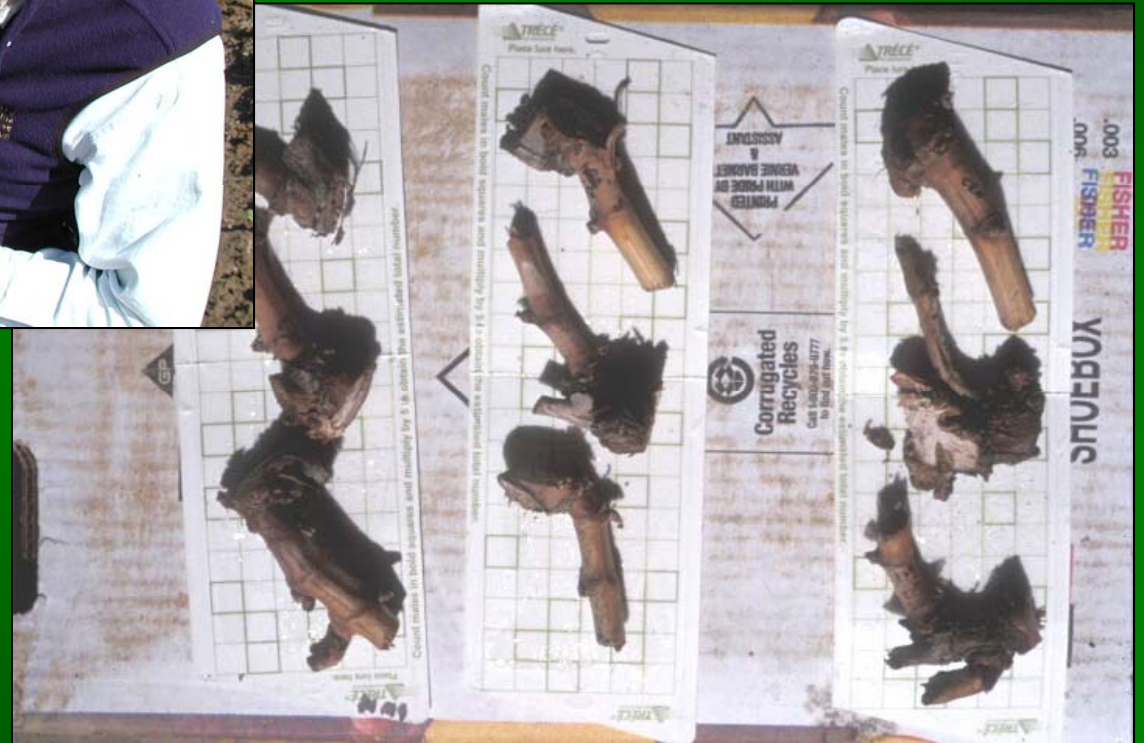
Grape mealybug
Distribution ●



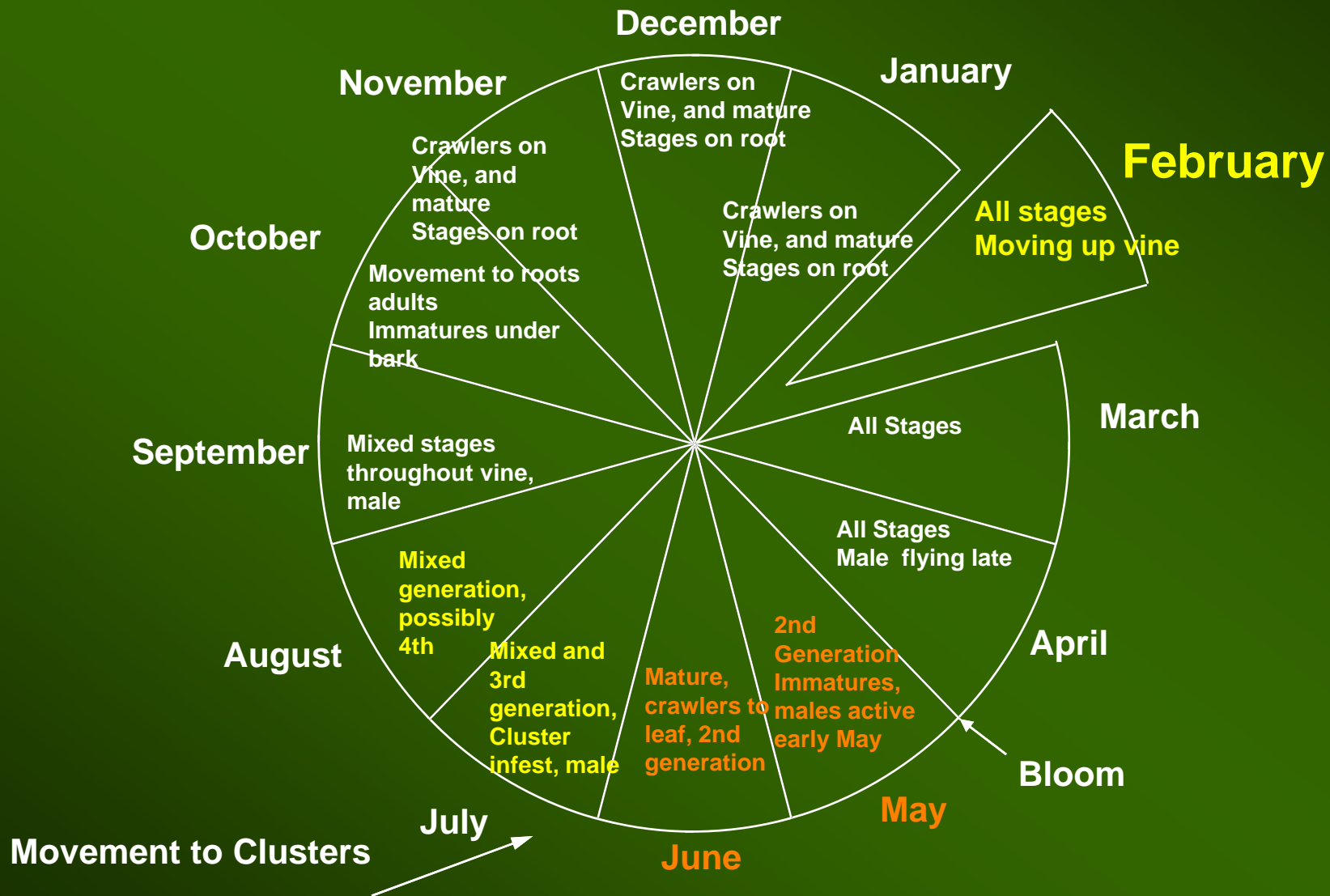
Infested Nursery Plants



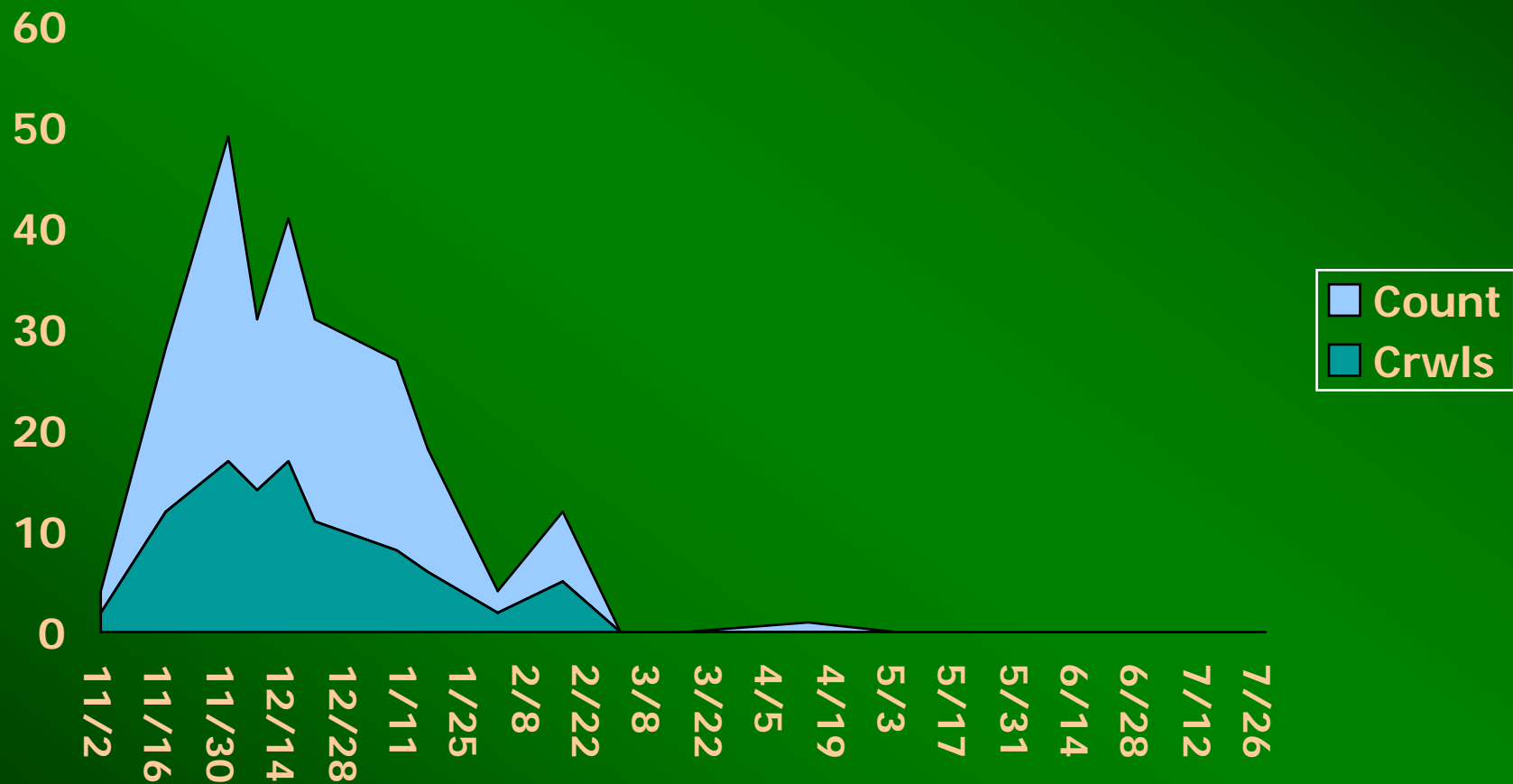
Monitoring for Mealybug



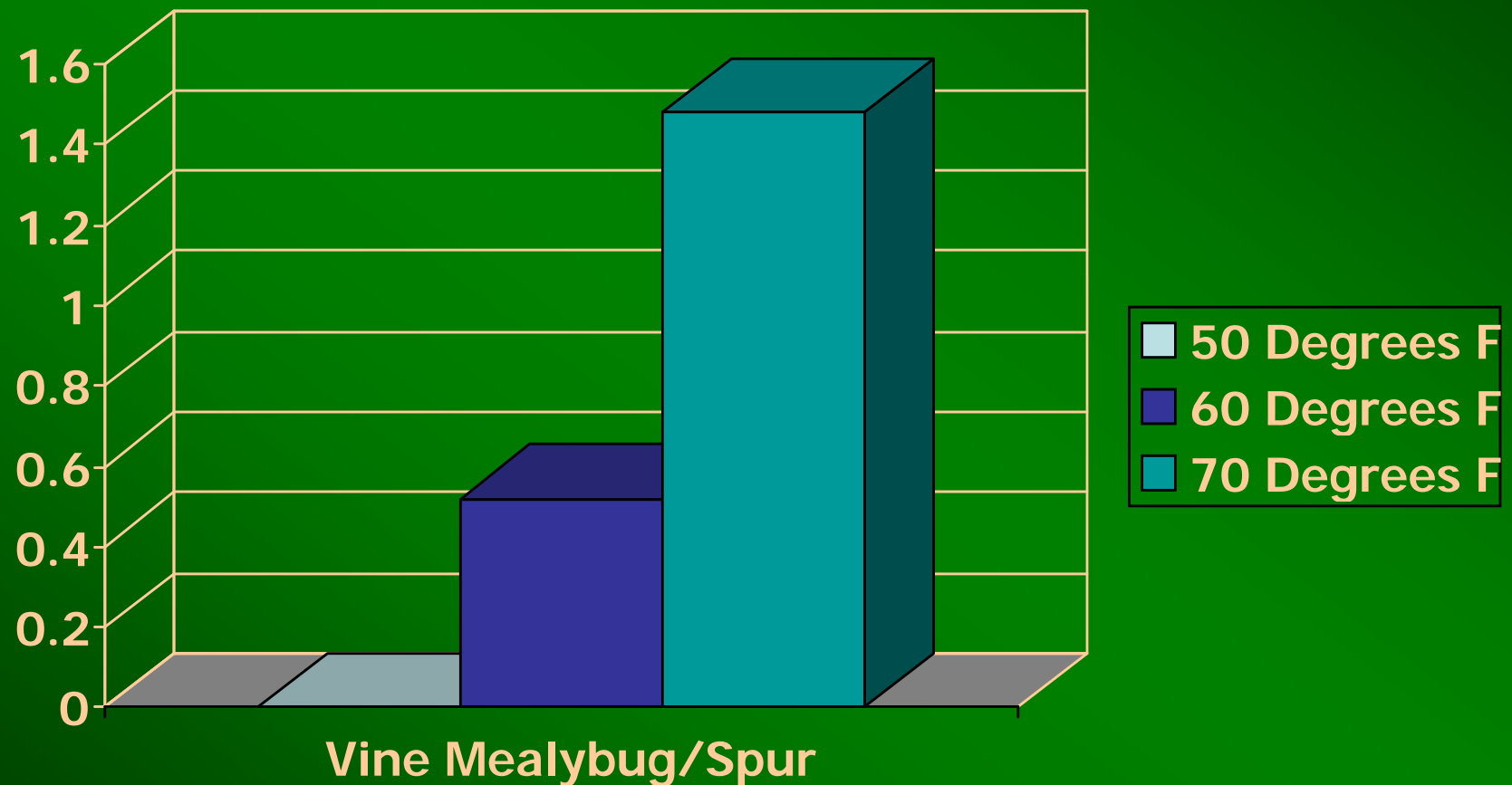
Seasonal Development of Vine Mealybug in Central San Joaquin Valley



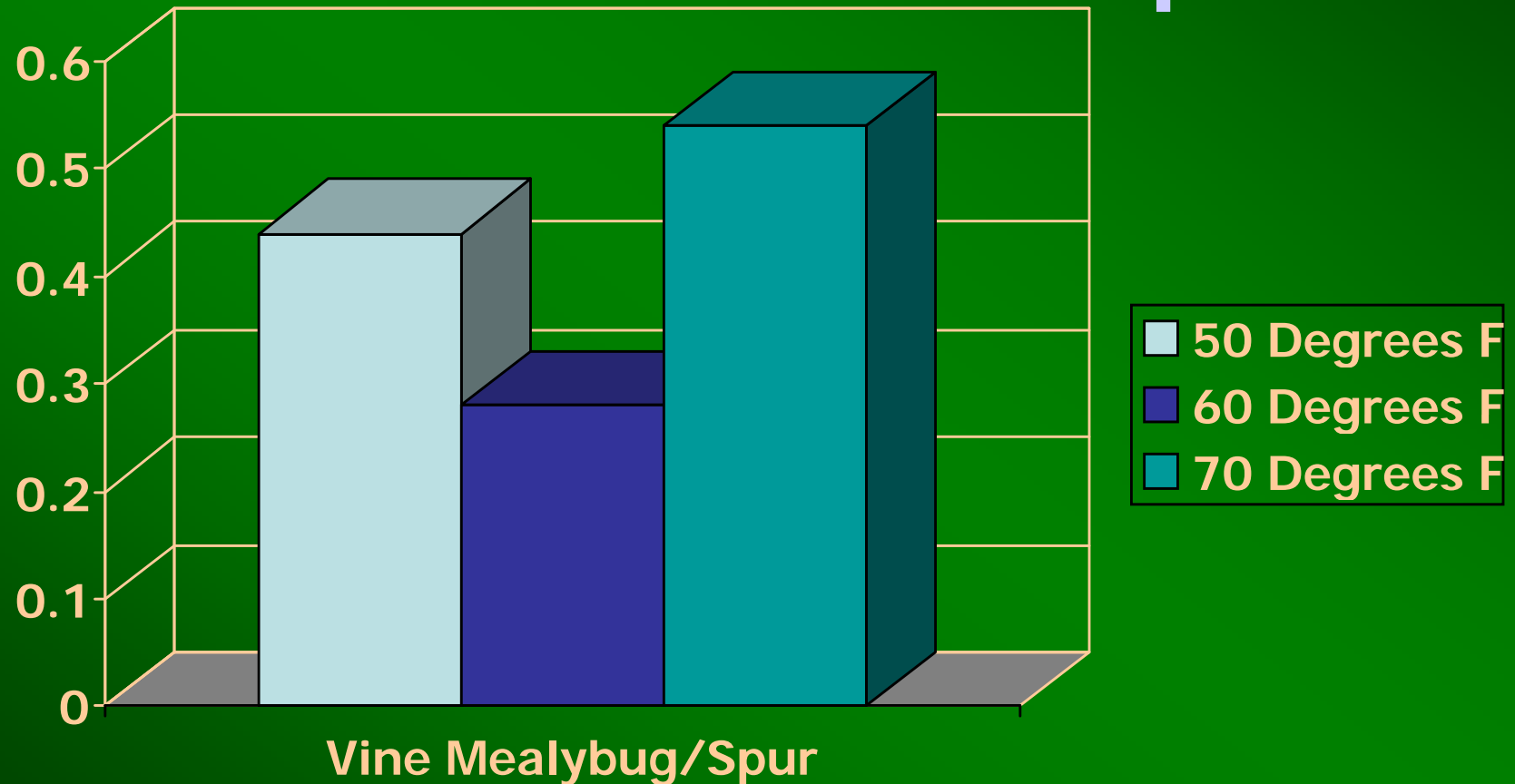
Vine Root Searches 2001, Live Vine Mealybug



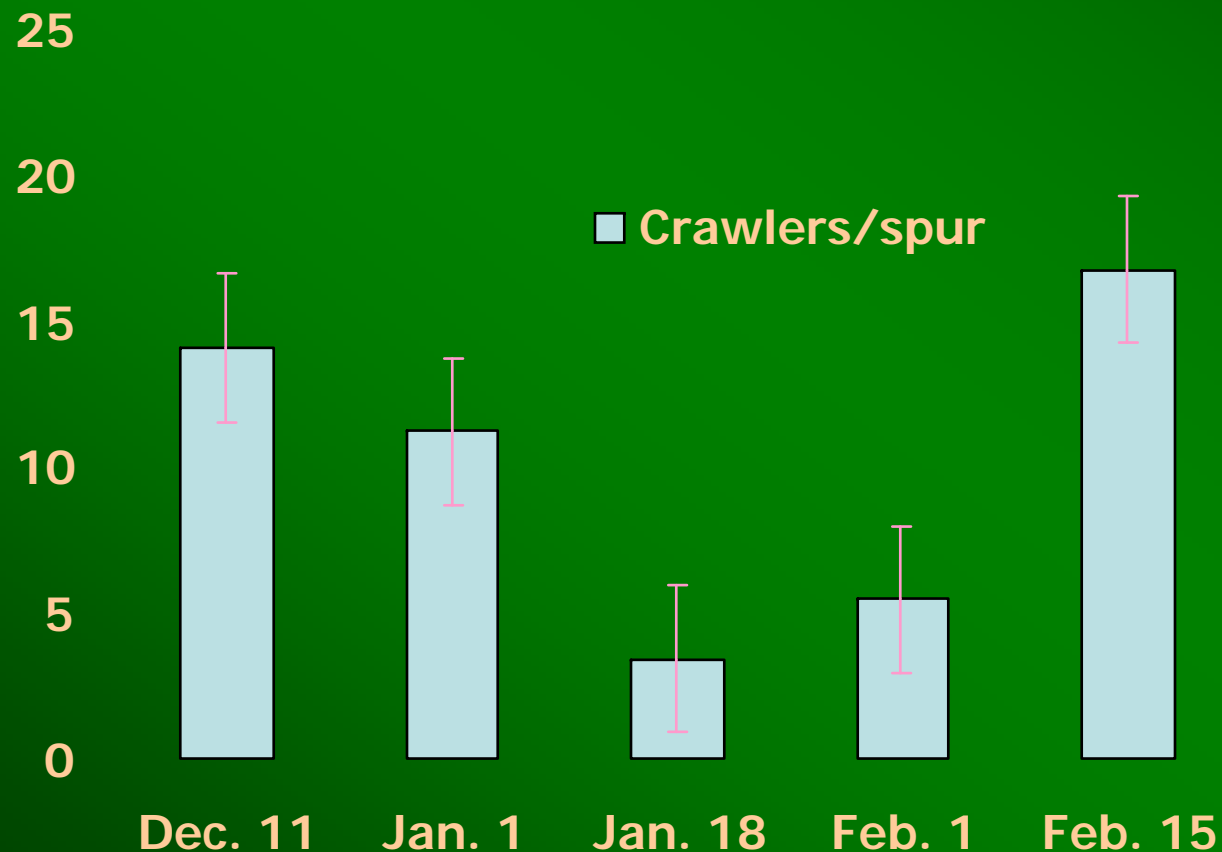
Vine Mealybug Movement from Spurs 3/11-3/29



Vine Mealybug Movement from Incubation to Room Temperature



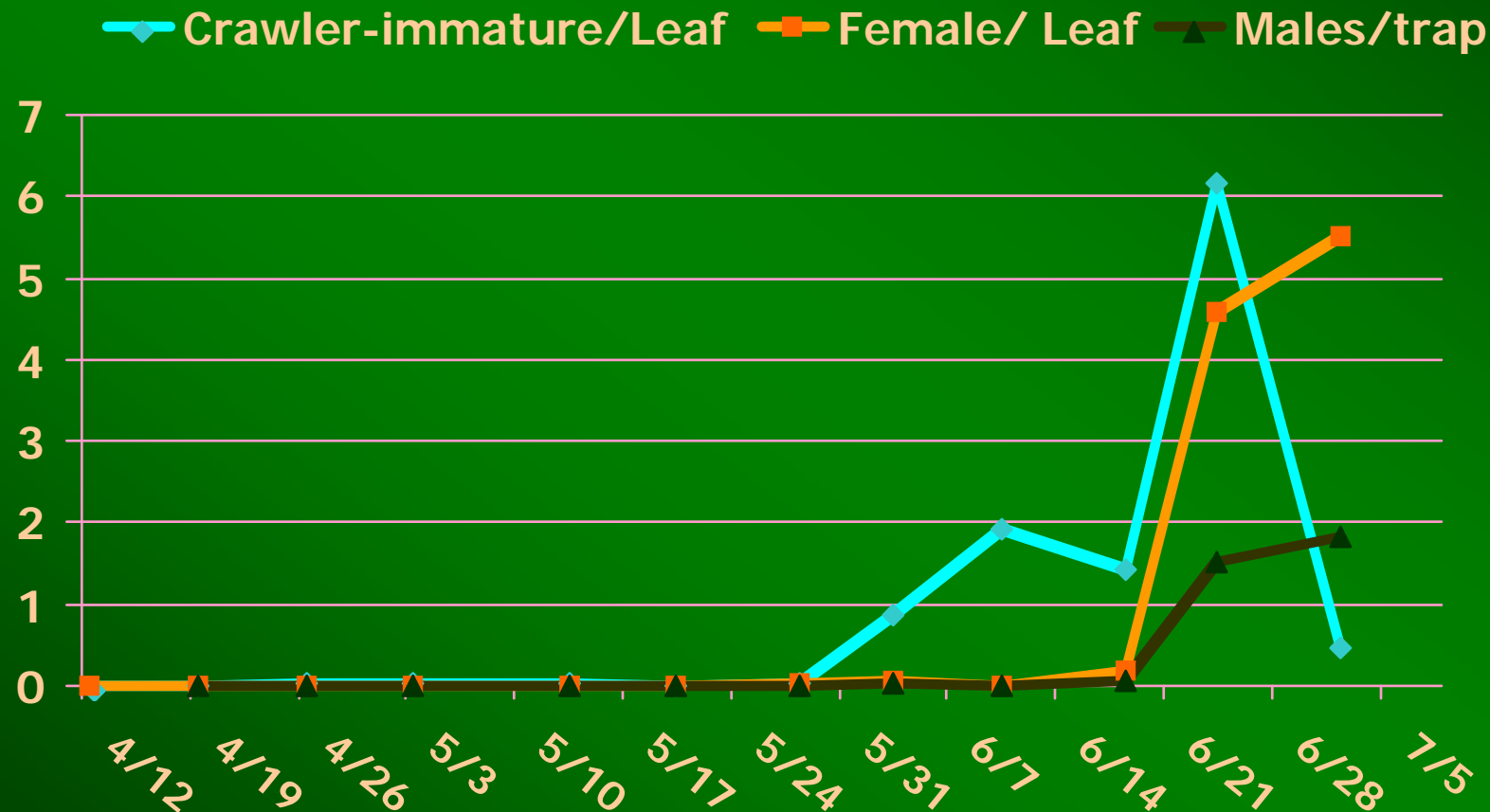
Vine Mealybug, Crawlers/Spur Through Winter 2002



Vine Mealybug on Leaves(June 20) Following Insecticide Spray



Vine Mealybug Crawler and Male Seasonal Activity 2008



Mealybug Insecticide Trials



A listing of Contact insecticides

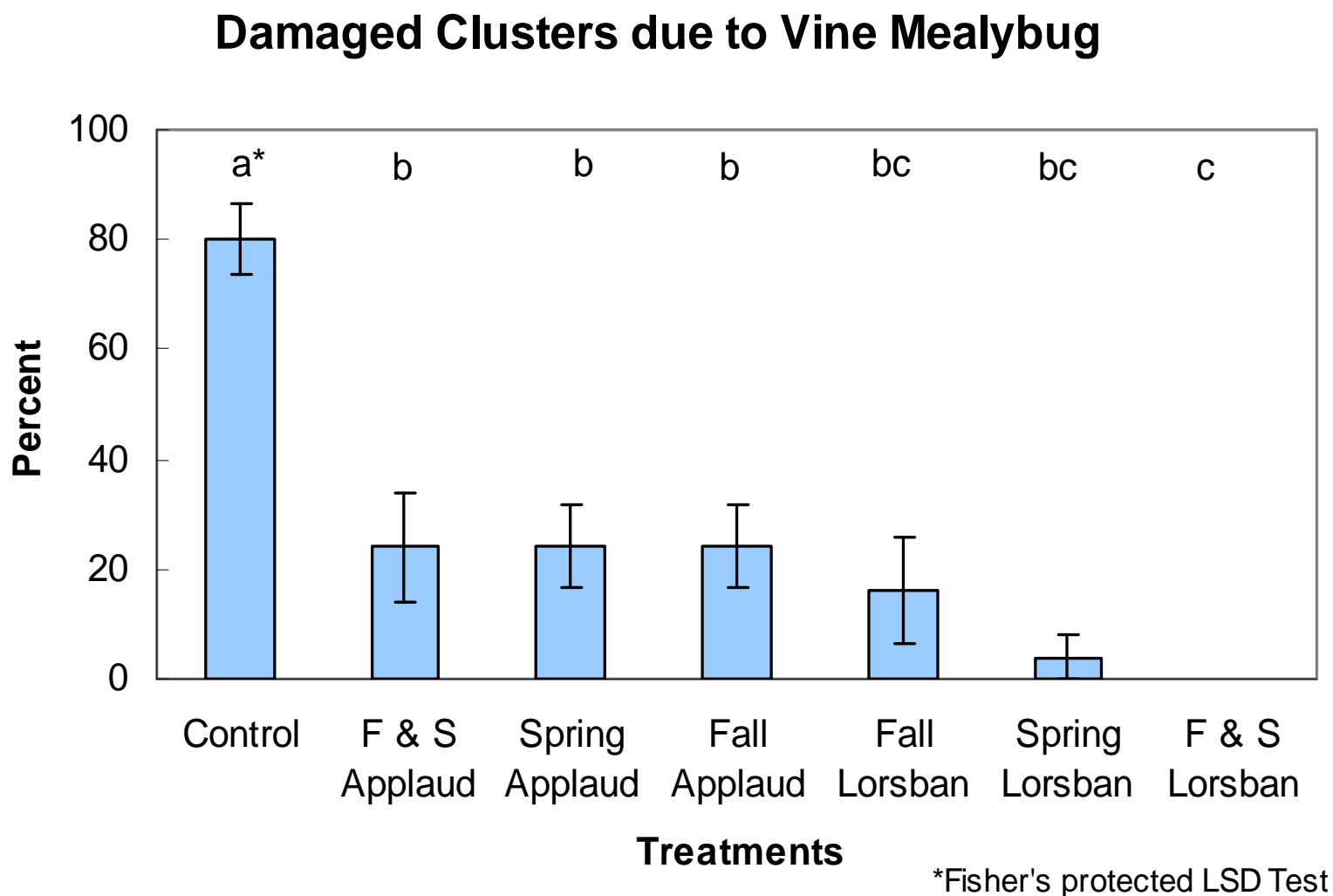
From: Danne,
Yokota, and
Bentley, July
2008

QuickTime™ and a
H.264 codec
are needed to see this picture.

Materials and Methods

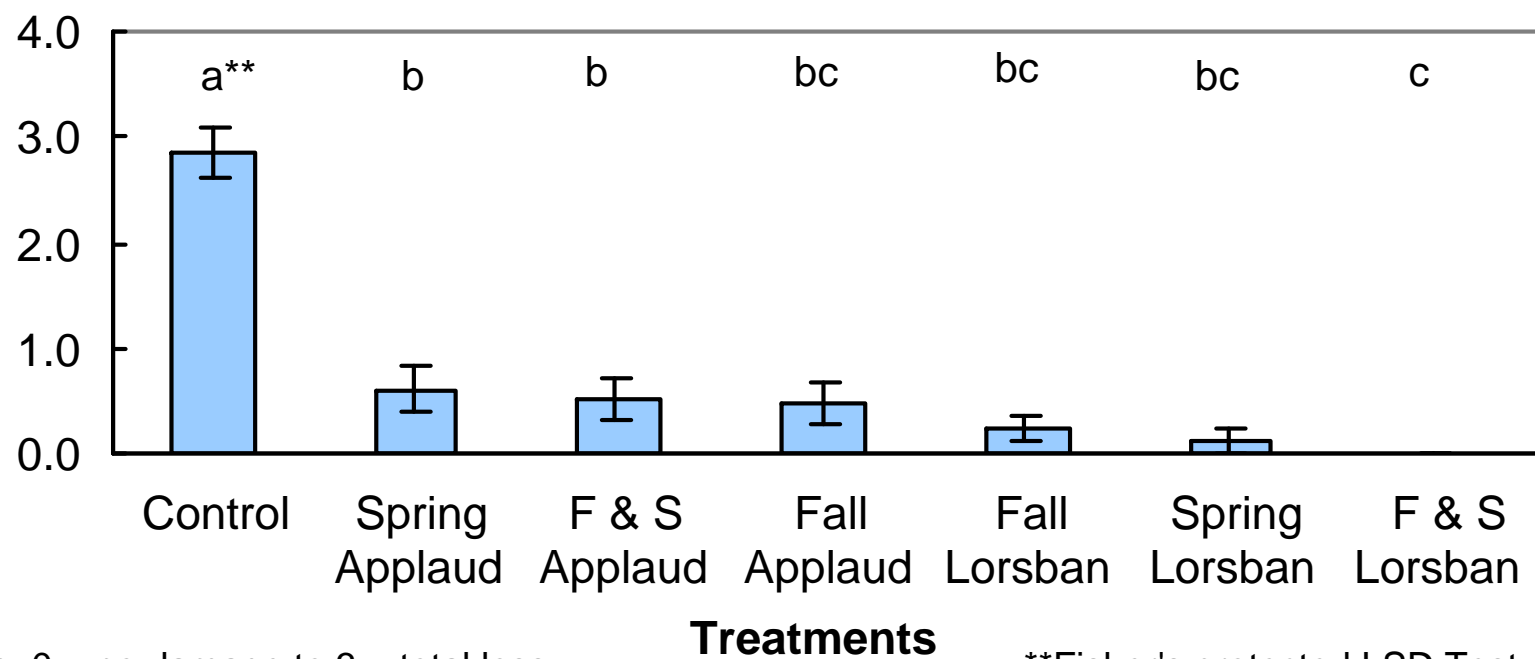
- **Uniformly infested vineyard – Sanger CA**
- **Trial: 7 treatments, 5 blocks, 3 individual vine replicates/treatment**
- **2 Pesticides: Applaud (12 oz/ac) and Lorsban (4 pts/ac) + Control**
- **3 Applications: fall (Oct. 14, 2004), spring (Mar. 3, 2005), doubled application in both fall and spring on the same vine**

Cluster Damage from VMB



Cluster Damage Severity

Cluster Damage Severity due to Vine Mealybug



*scale: 0 = no damage to 3 = total loss.

**Fisher's protected LSD Test

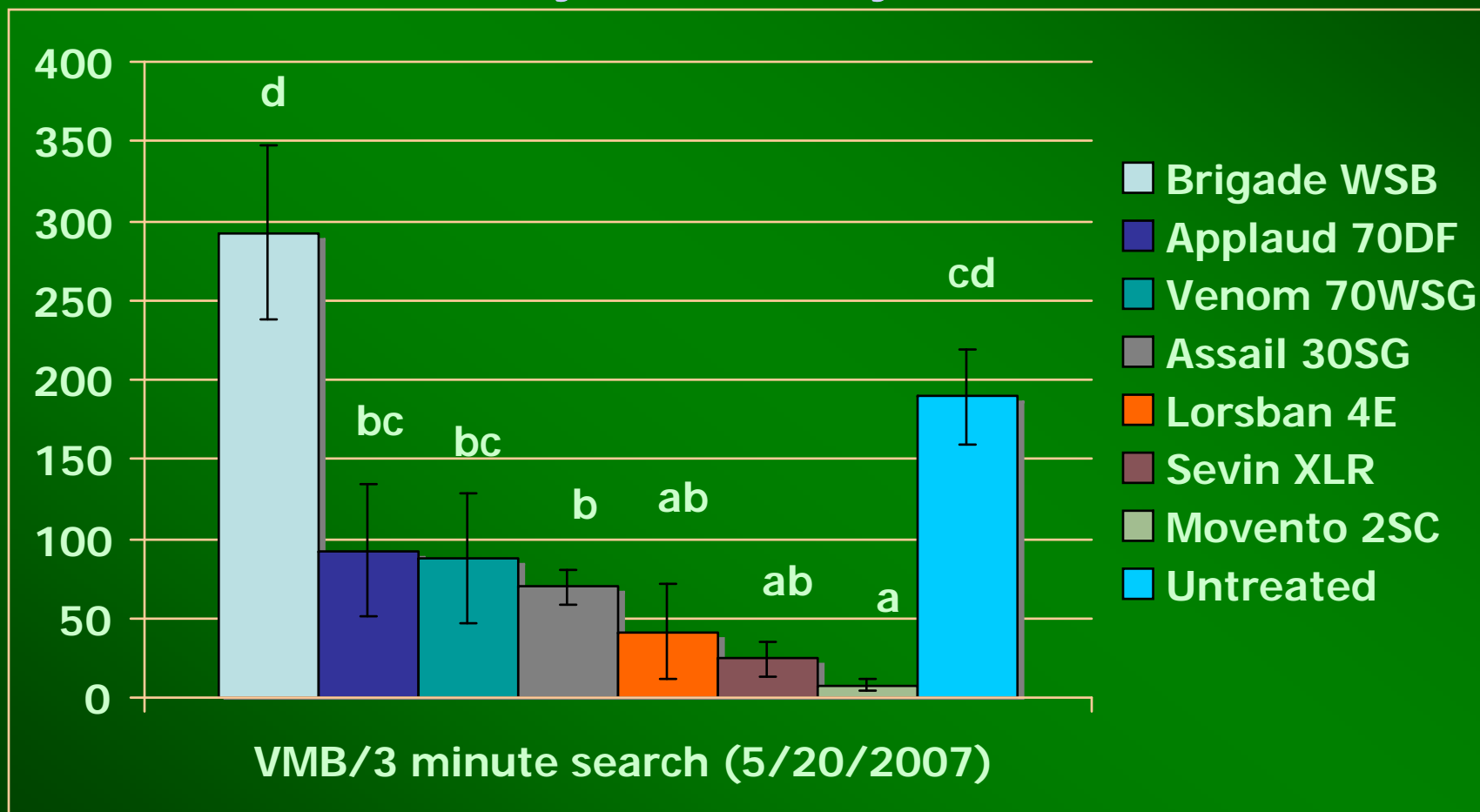
Winter
Crawler
location



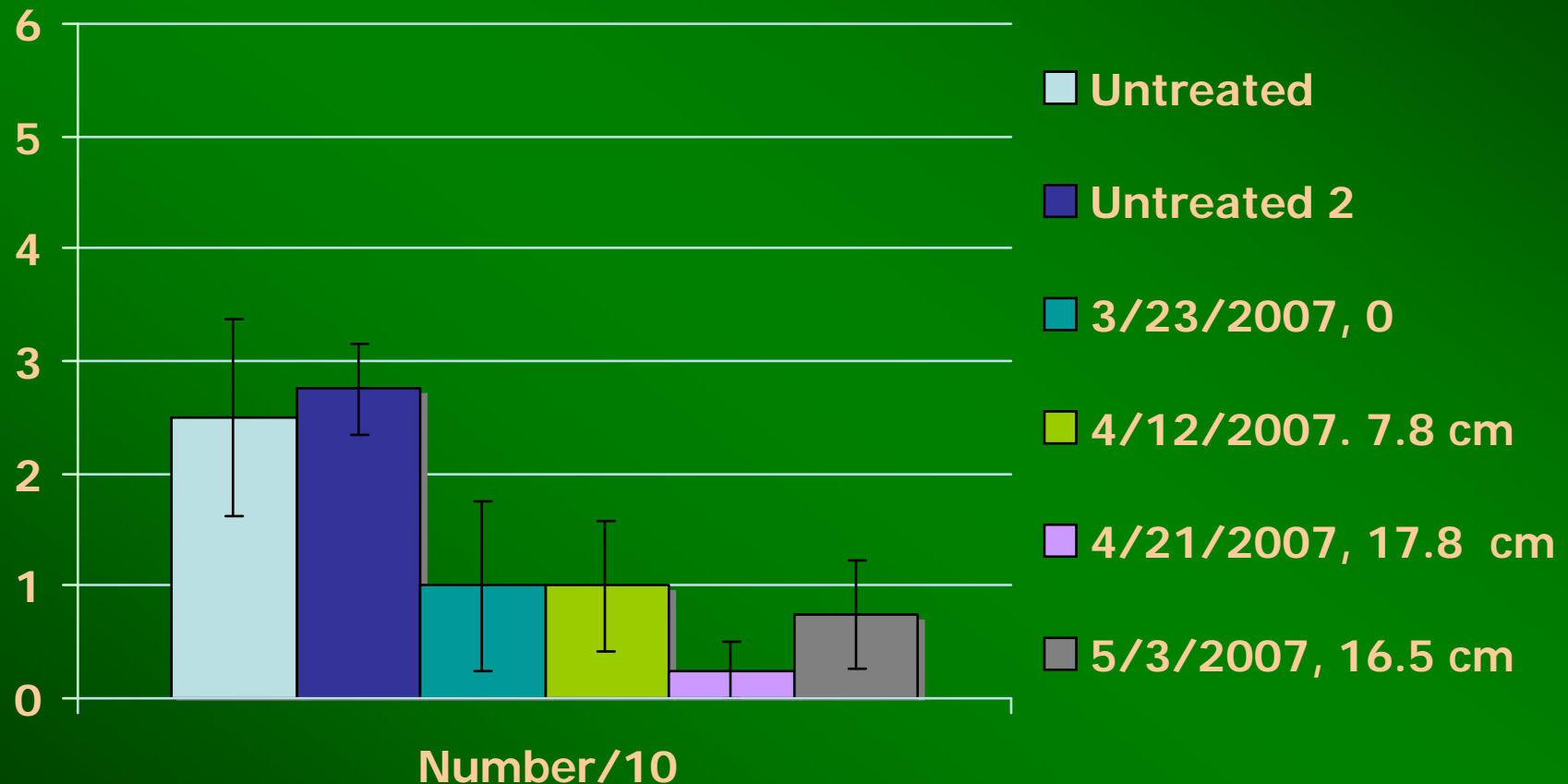
Post Harvest (8/28/06)

Insecticide Application

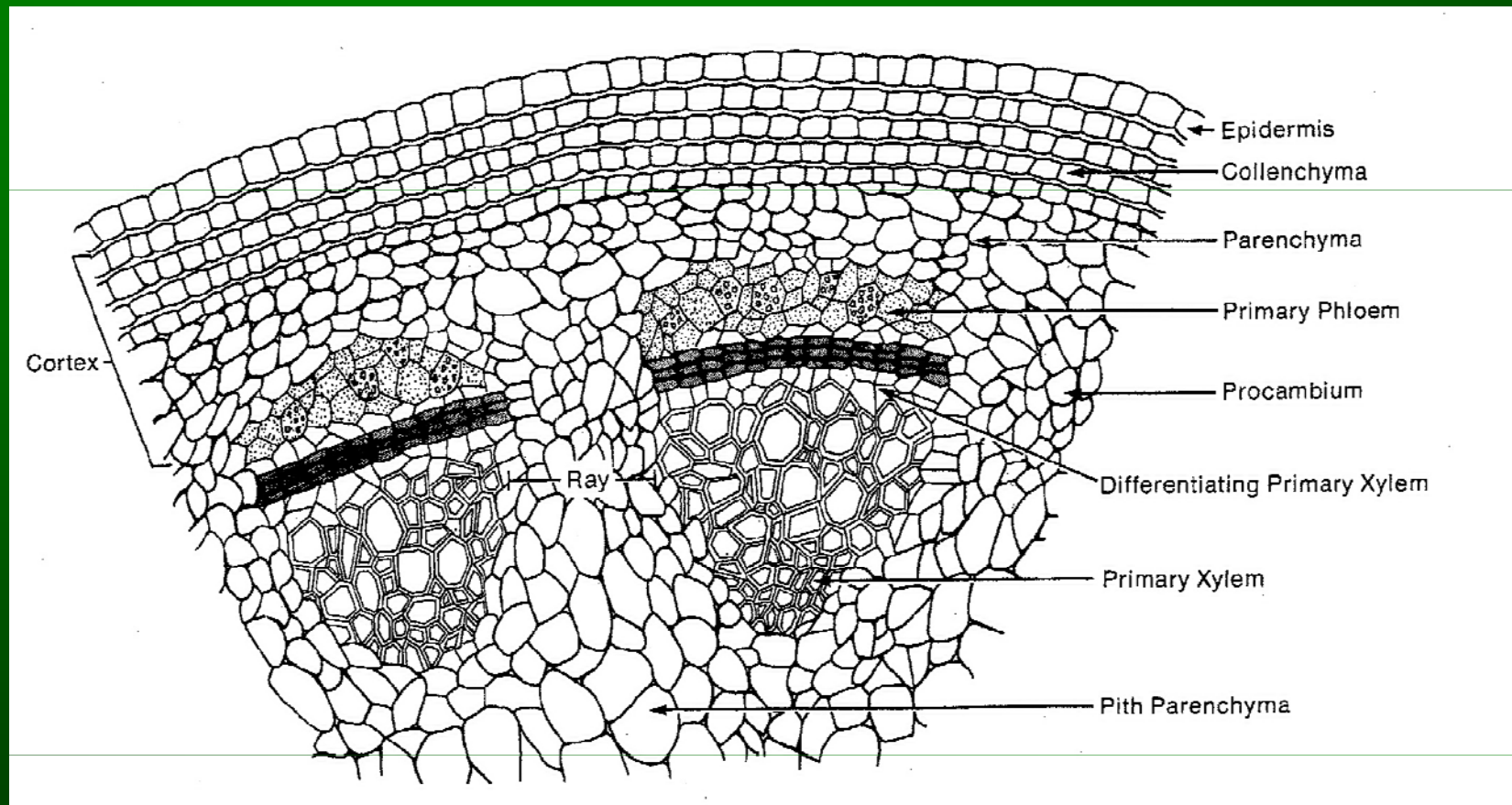
(From Haviland and Buckey, Kern County UCCE 2008)



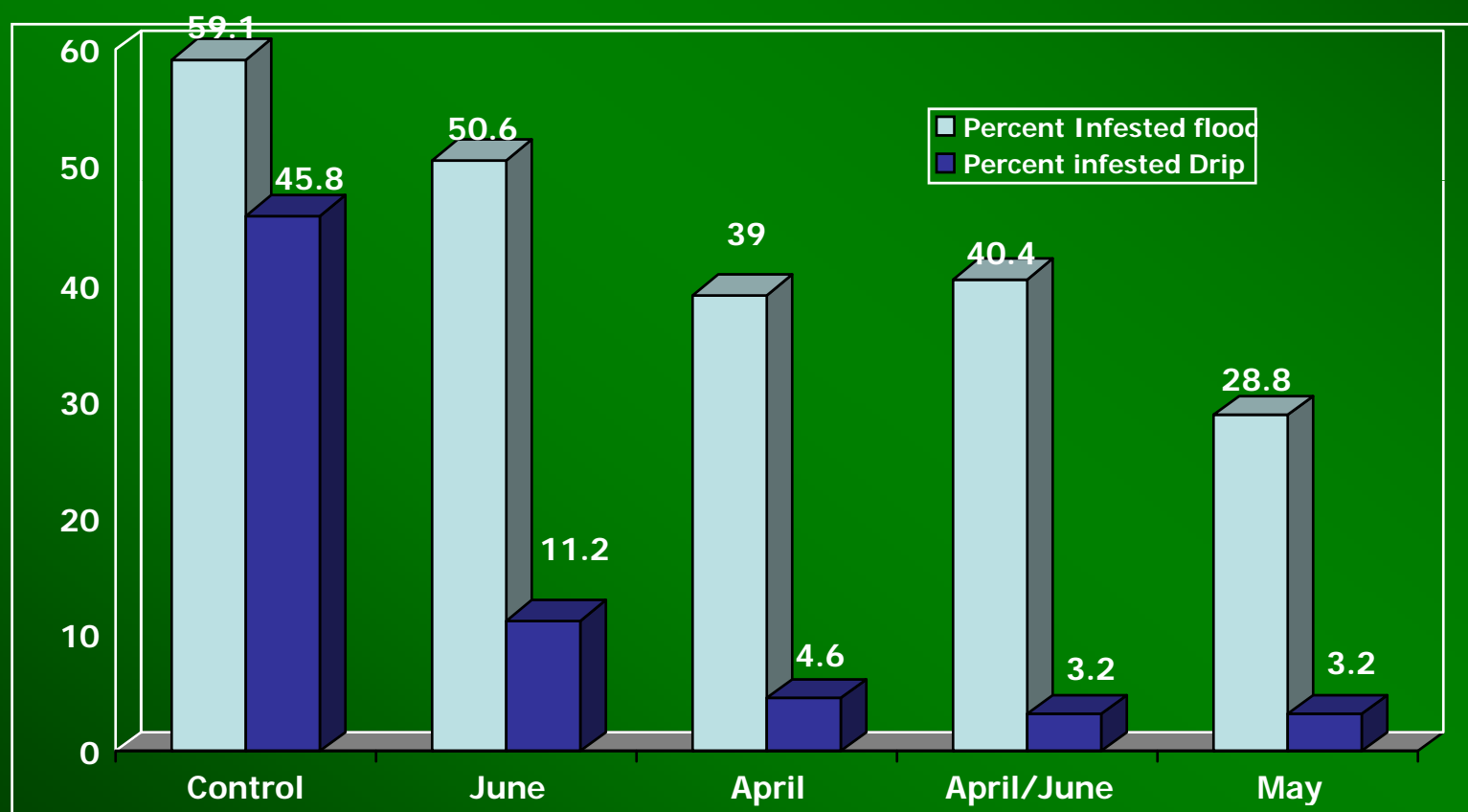
Applaud Timing Trial , Vine Mealybug, Thomson Seedless, 2006



Stem Cross Section

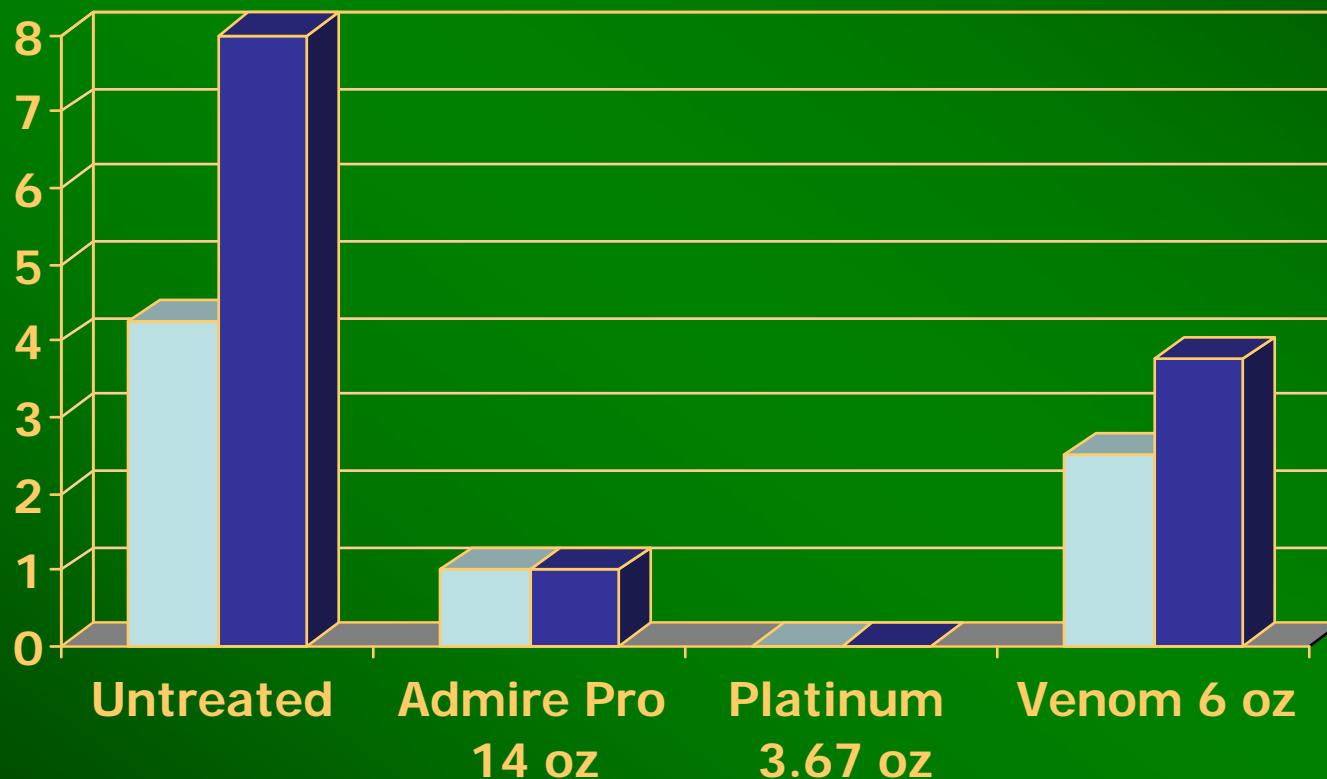


Choolgian Vine Mealybug Flood vs Drip Treatments Imidacloprid, 2002

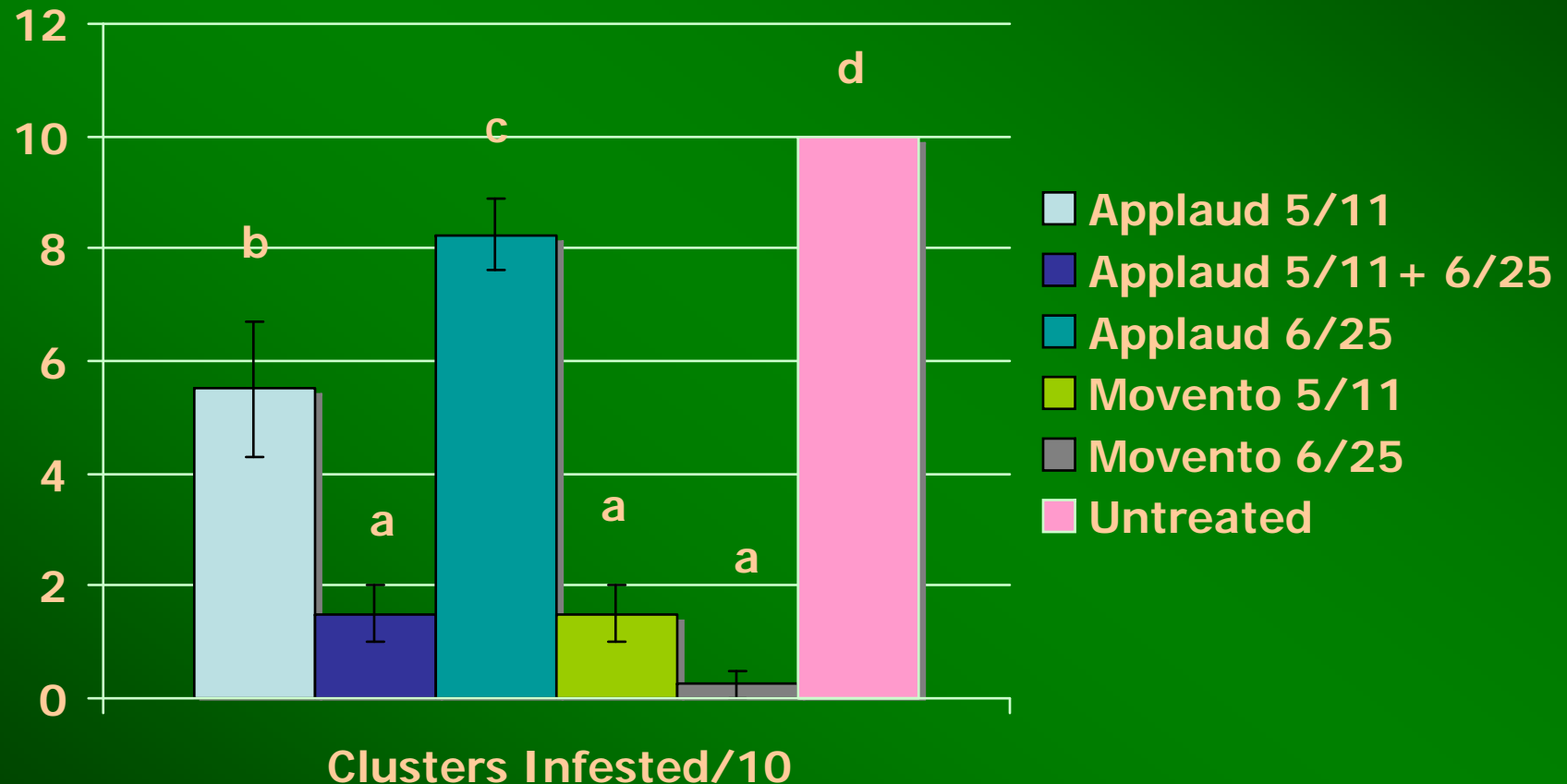


Vine Mealybug Systemic Trial 2008, Treated 6/5 and Sampled 7/2

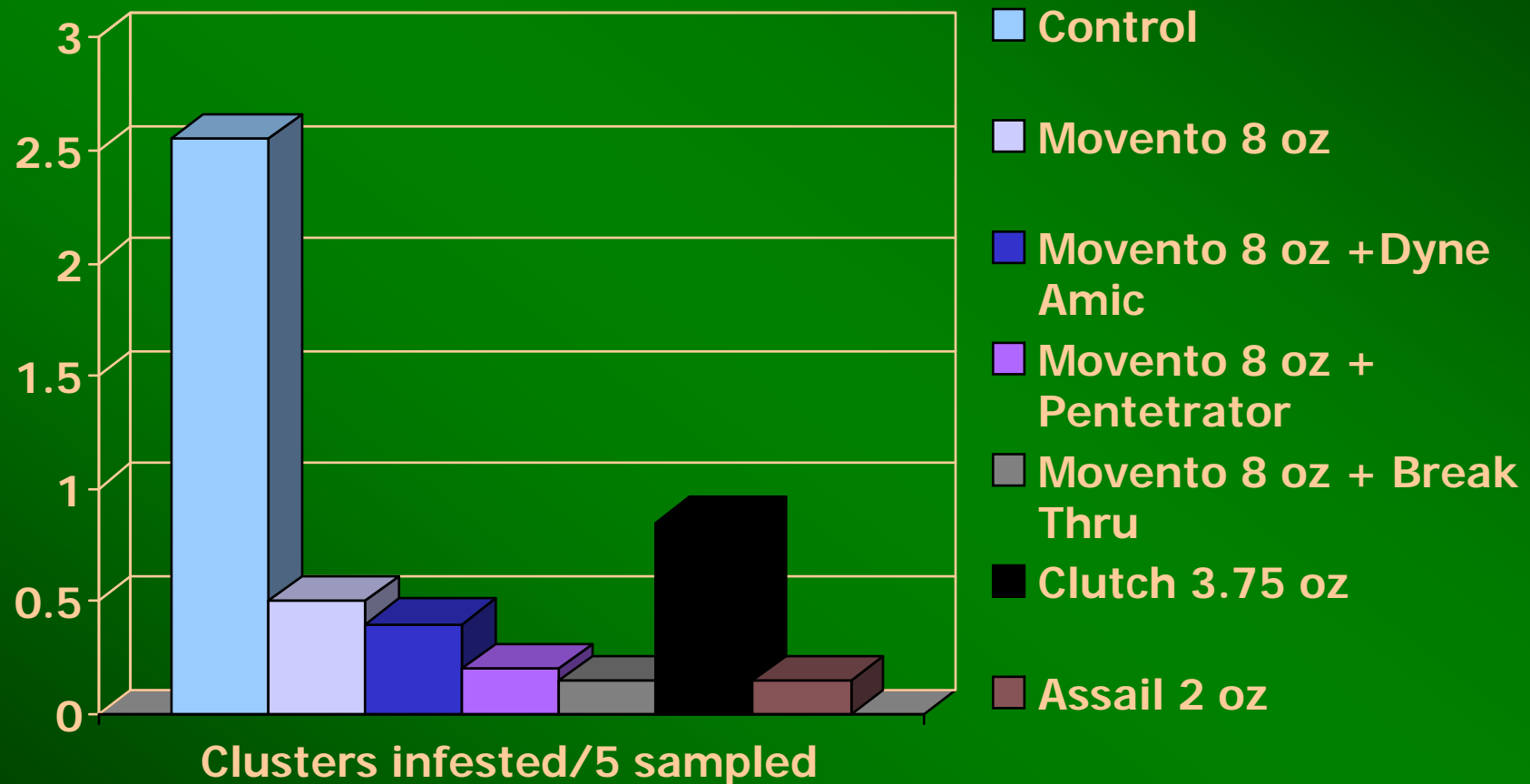
■ Number infested/5 ■ Severity of Infested



Vine MB Inseason Controls, Reading 8/21, 2007



Effects of Various Insecticides (6/30) on Vine Mealybug Infestation (7/25)





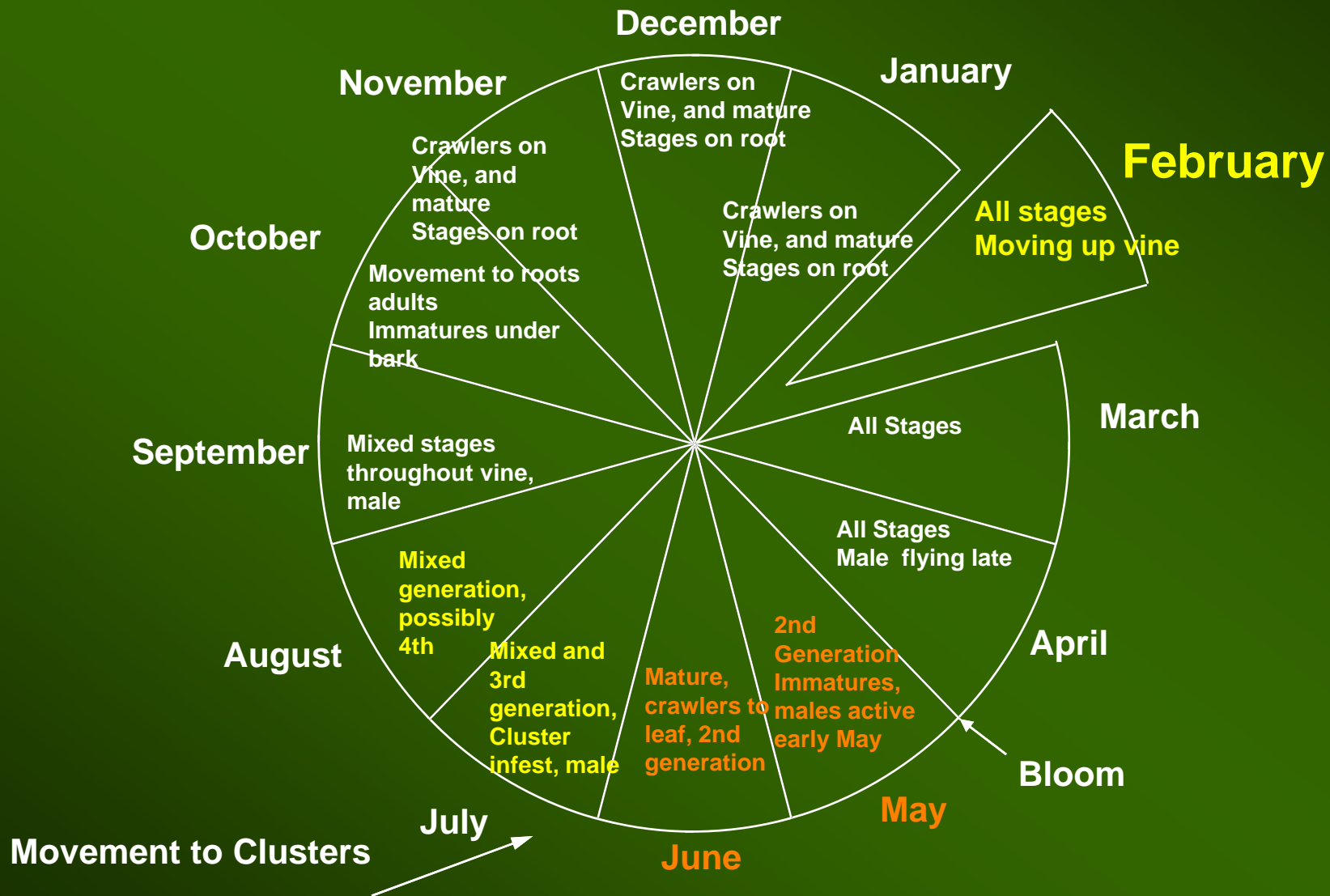
Vine mealybug Biological Control



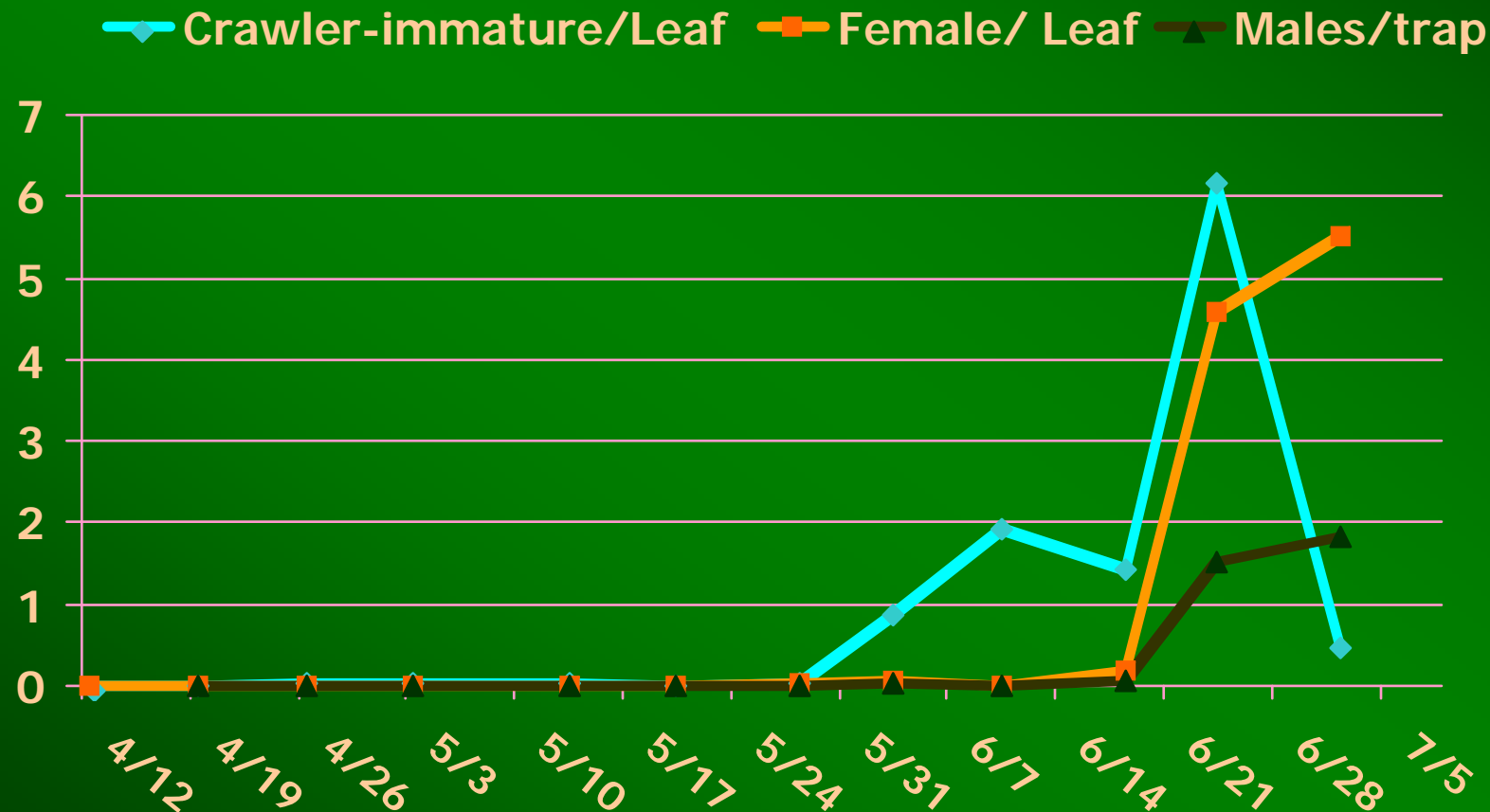
Integrating the Management

- **Important to preserve biological control**
- **Chemical control is necessary**
 - Integration involves the product and when it is applied.
- **Selective (harmful to target but not biocontrol)**
 - Applaud, Admire, Movento, Platinum, Oils
- **Non Selective**
 - Assail, Lannate, Dimethoate, Diazinon, Lorsban, Sevin
- **Timing is Selective**
 - Lorsban in Spring but not post harvest
- **Other techniques**

Seasonal Development of Vine Mealybug in Central San Joaquin Valley



Vine Mealybug Crawler and Male Seasonal Activity 2008



MALE VMB

SEABRIGHT LABORATORIES

...Earth Friendly Products

Emeryville, CA 94608 USA

Emeryville, CA 94608 USA

...Earth Friendly Products

SEABRIGHT LABORATORIES



Monitoring for Vine Mealybug with Pheromone Traps

David Haviland, Entomology Farm Advisor, UC Cooperative Extension, Kern Co.
Printable color version available at cckem.ucdavis.edu/entomology/vine_mealybug.htm

Recommendations for pheromone traps

- Vine mealybug pheromone lure (product of Suterra LLC)
- Red Pherocon® Delta IIID sticky trap (product of Trécé, Inc.)
- Place 1 trap per ~20 acres
- Hang within canopy from trellis in high-traffic areas
- Check trap every 2-4 weeks
- Replace lure every 2 months



Mealybug males are similar in size to these periods. Preliminary identifications can be made with a 10x hand lens. Thirty to 40x magnification is recommended for confirmation.

Pheromone traps are a highly effective method for determining the presence of vine mealybug in vineyards. Trap can be used to survey for this pest in areas where it is not known to occur, or as a monitoring tool within infested vineyards.

Male vine mealybug characteristics

- Amber/brown color, not black
- Long antennae
- Large, egg-shaped thorax with a narrower abdomen



- Two wings with no noticeable veination (wings often difficult to see when stuck on a card)
- Eyes prominent, appear red to black



Other small insects that may appear similar to vine mealybug males



Aphids



Thrips



Parasitic wasps



Springtails



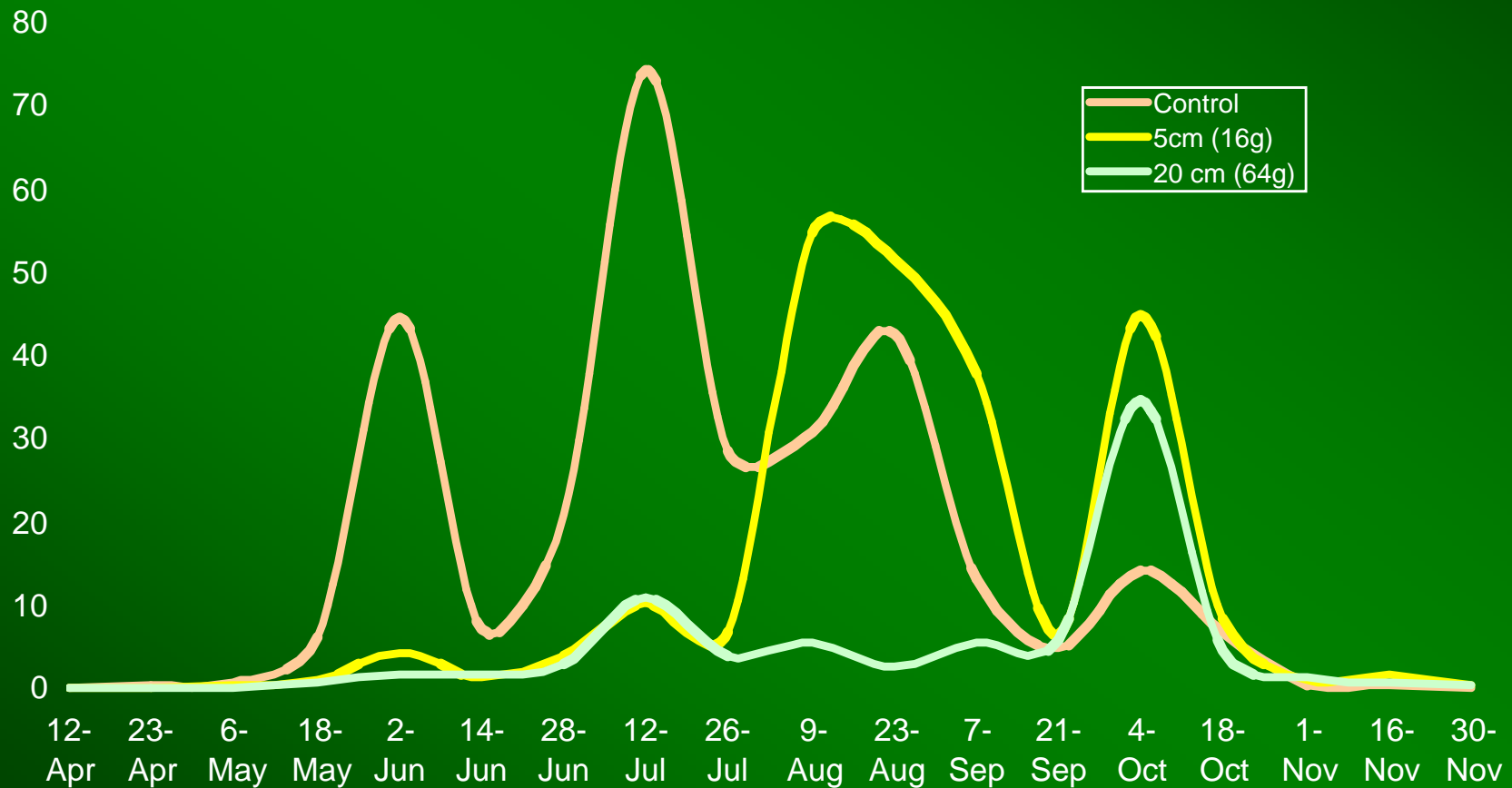
Vine mealybug pheromone traps are very effective, and can attract males from adjacent fields over ¼ mile away. It is therefore necessary to use ground searches to validate the presence of vine mealybug females in a vineyard with trap catches.

For further assistance with identification, or to report mealybug finds in counties or regions not known to have vine mealybug, visit your County UCCE or Ag Commissioner's office.

Vine Mealybug Trapping and Mating Confusion



Isomate Mating Disruption, Vine Mealybug Seasonal Flight



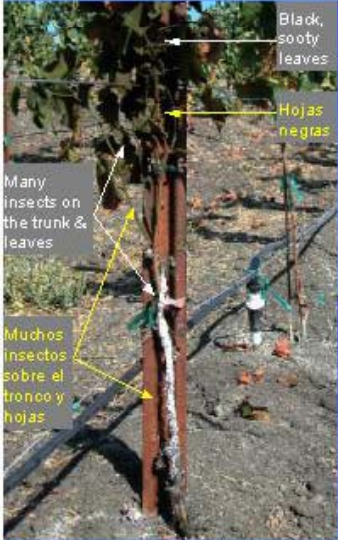
Vineyard Worker Education

Wanted: Vine Mealybug

Se Busca: El Piojo Harinoso de la Vid

The Vine Mealybug is a serious new insect pest for California vineyards; it is important to locate any new infestations as soon as possible. If you find insects that look like the Vine Mealybug, notify your local Cooperative Extension or Agricultural Commissioner office for positive verification.

El Piojo Harinoso de la Vid es una nueva y seria amenaza para los viñedos en California; es importante encontrar lo más pronto posible cualquier infestación nueva. Si encuentran algo parecido, avisen a su oficina local de Extensión Cooperativa o Comisión de Agricultura para recibir verificación.



Black, sooty leaves
Hojas negras

Many insects on the trunk & leaves
Muchos insectos sobre el tronco y hojas

Infested vines can be spotted by the large masses of white insects and the dark, sooty leaves.

Las plantas infestadas se destacan por las masas de insectos blancos y las hojas negras.



Vine Mealybug
Piojo Harinoso de la Vid

Actual size
Tamaño actual

The adult insect is about 3 mm long; it is often tended by ants.

El insecto adulto mide alrededor de 3 mm; se encuentra asociado con hormigas.



Wet spots on the bark
Manchas sobre la corteza

Insects beneath the bark
Insectos debajo de la corteza

The Vine mealybug feeds on the entire vine, including the roots. The earliest indications of an infested vine are often wet spots on the lower trunk; peeling back the bark reveals the mealybugs.

El Piojo Harinoso de la Vid habita todas las partes de la planta, incluyendo las raíces. La primera indicación de una planta infestada suele ser unas manchas mojadas sobre el tronco inferior; pelando la corteza se descubre la infestación.

University of California Cooperative Extension
 For more information / Para más información: www.ipm.ucdavis.edu/PMG/r302301911.html

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Spur and VMB Counts

Presence of Vine Mealybug on Spur Samples

