Scale Insects and Plant Growth Regulator Update

Bob Beede
UCCE Farm Advisor, Kings County

Website: HTTP://CEKINGS.UCDAVIS.EDU

San Jose Scale

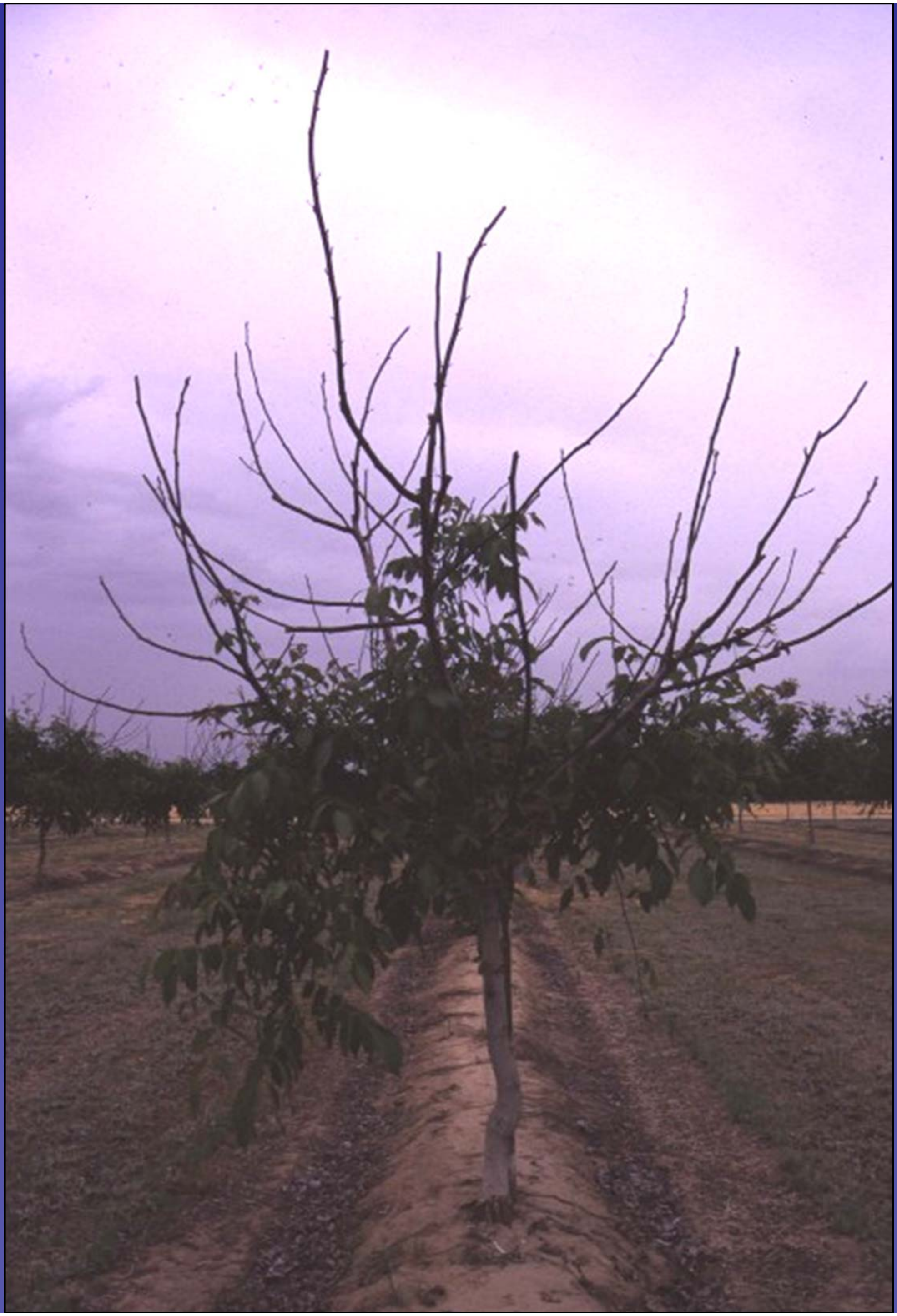
1. Not common in Walnut twenty years ago.
2. On the increase, possibly due to reduced in-season use of organo-phosphate insecticides.
3. Research documents loss of vigor, fruiting wood, large limbs 4 to 6 inch in diameter!
4. Requires close monitoring and treatment of increasing populations.
5. Four generations per year.
6. Parasitism and predation often insufficient.

Considerations for Treatment Timing

1. Population density
2. Coverage
3. Secondary pest outbreaks- Aphids, Mites
4. Loss of beneficials
5. Ability to combine with Codling Moth Spray
6. COVERAGE !!

How About Oil?

- Dormant: NO!!!
- In-season: Labeled rates will provide suppression

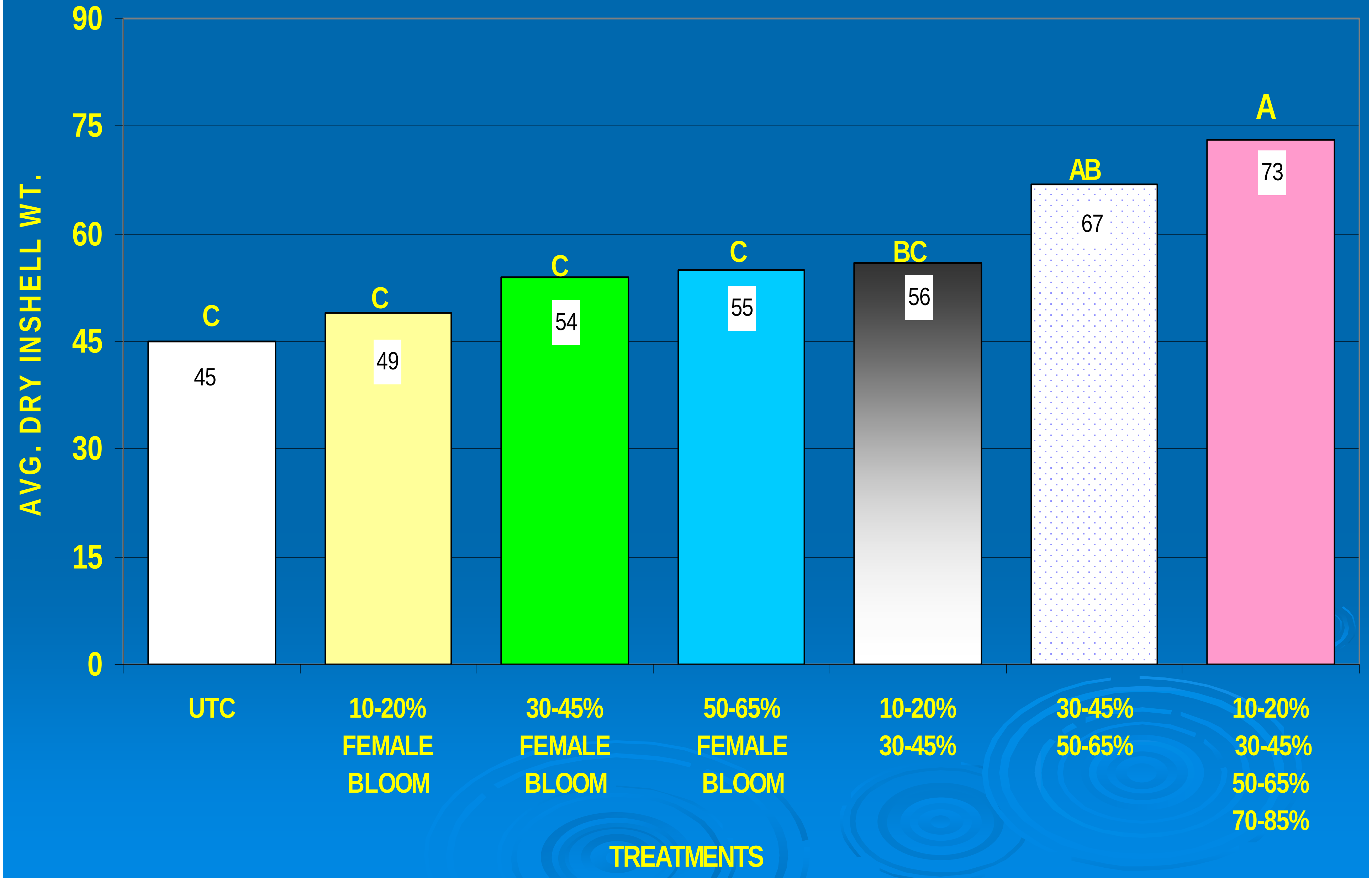


ReTain For Reducing Pistillate Flower Abortion in Walnut: An Extension Success Story

Bob Beede,
Farm Advisor
University of California
Kings County

WISECARVER FARMS 2010 RETAIN TIMING TRIAL

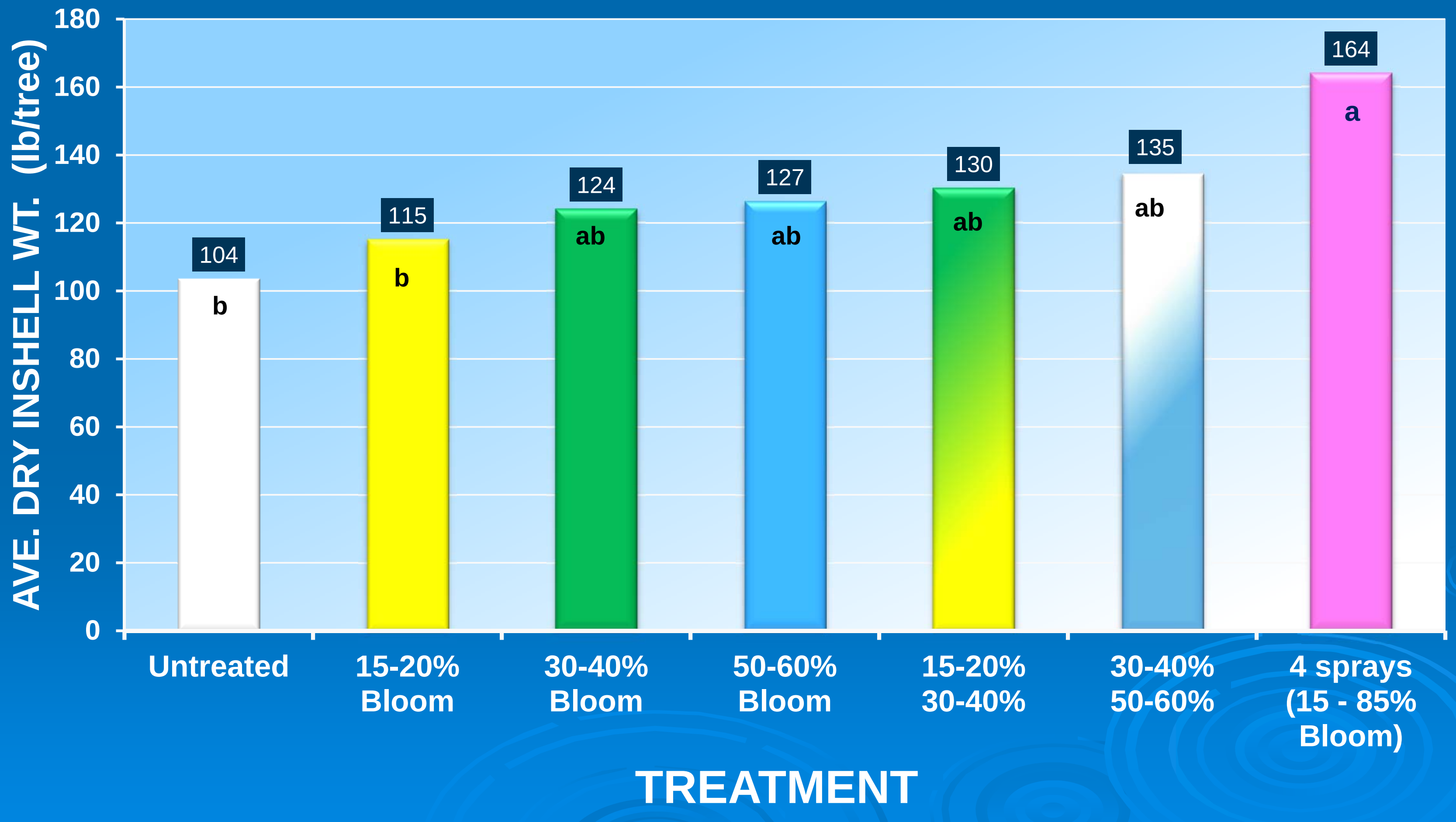
AVERAGES BASED ON NINE SINGLE-TREE REPS PER TREATMENT



2011 ReTain Timing Trial: Effird Farms

Data represents average dry wt yield of seven single trees

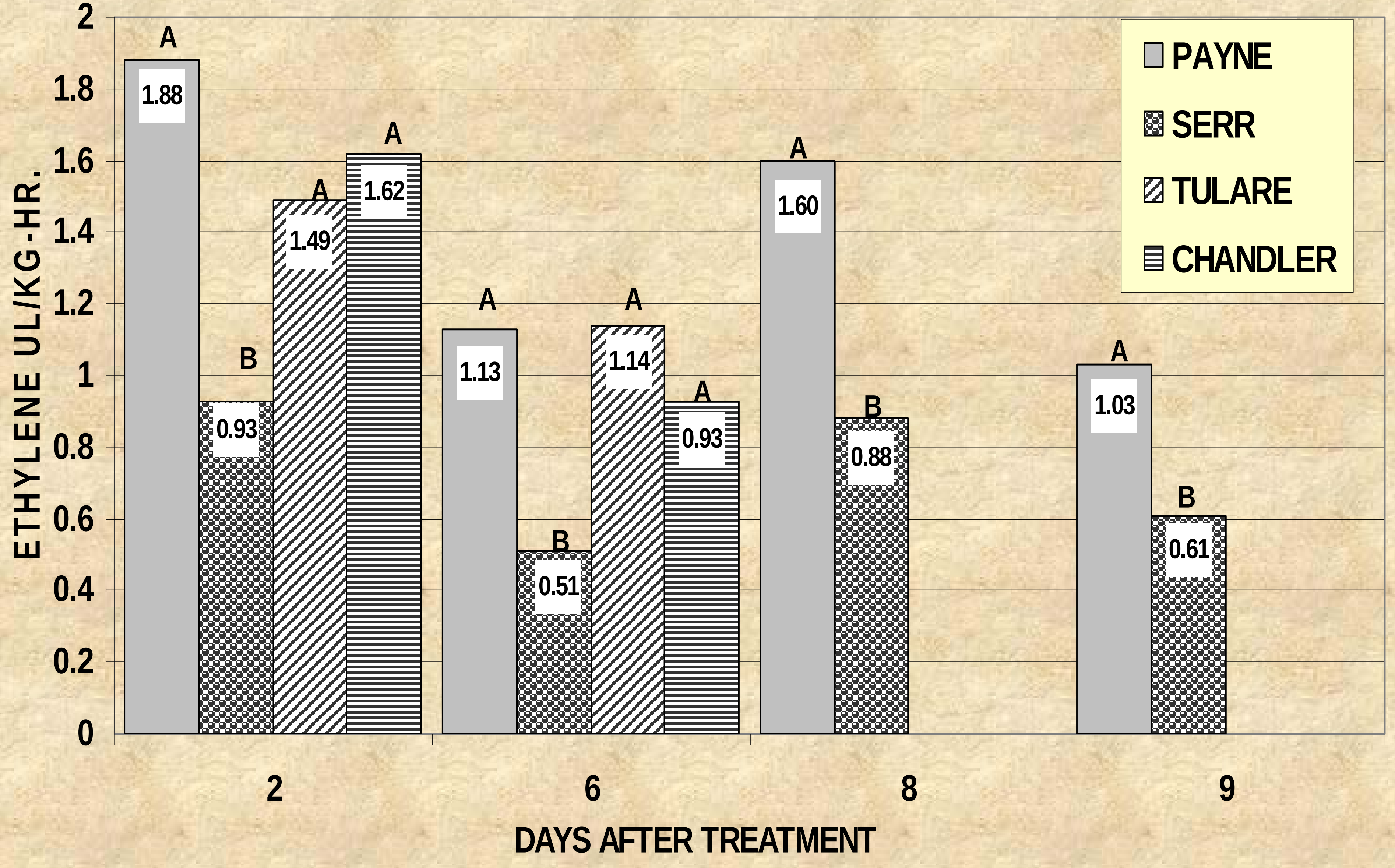
Rate per application: 1 bag/ac, 200 gpa (50 tree/ac)



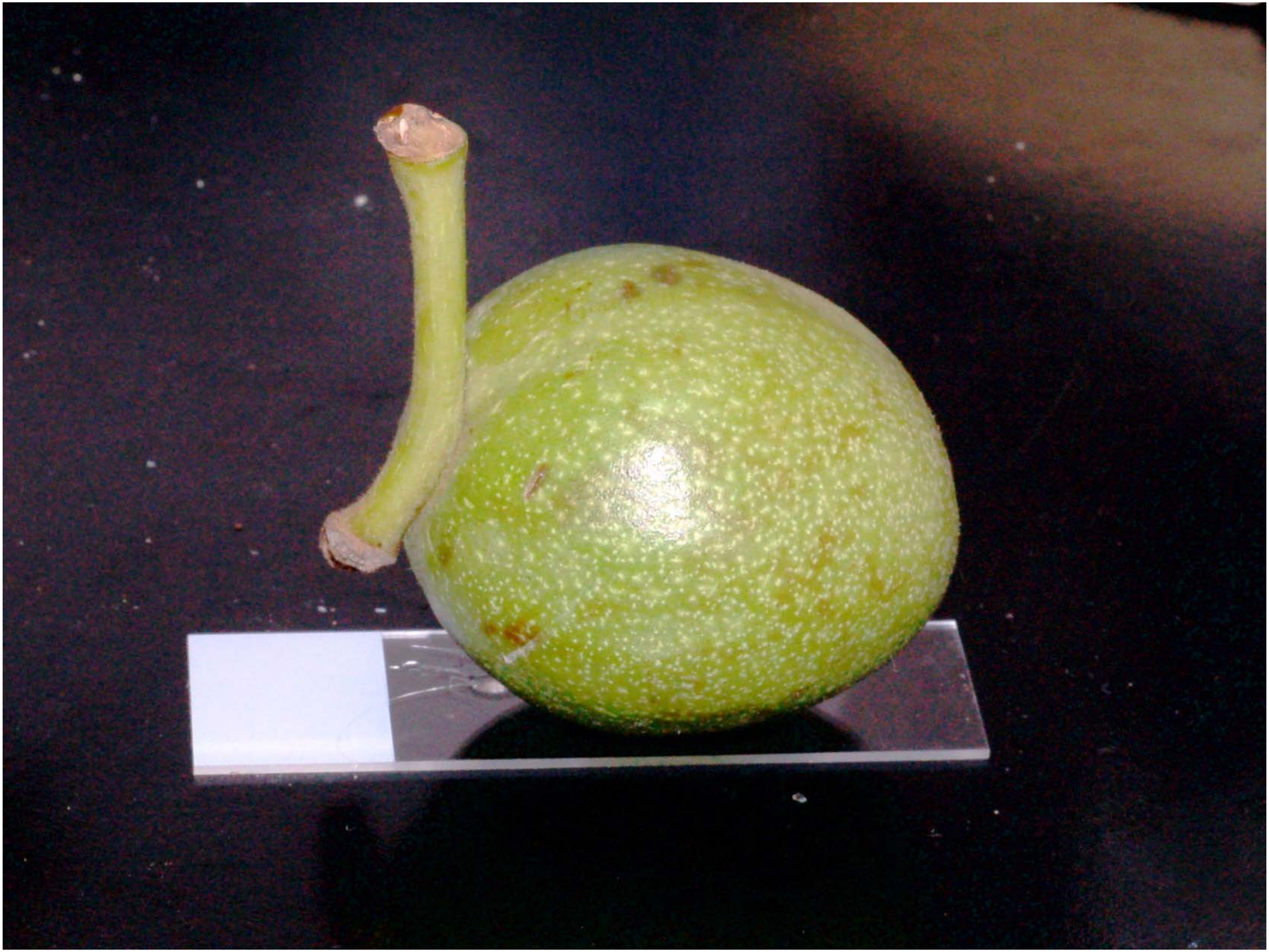
Refining Ethephon Use in Walnuts

Robert Beede
UCCE Farm Advisor
Kings County

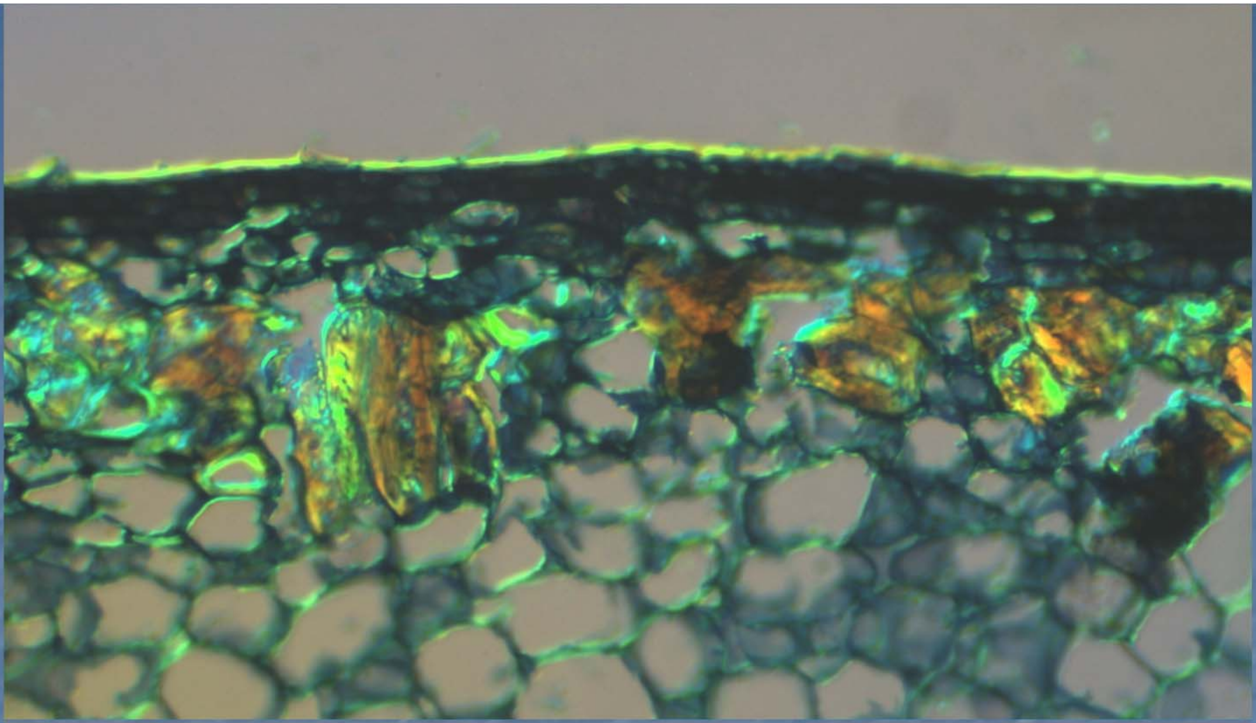
WALNUT ETHEPHON EXPERIMENT: 1200 PPM (3 YEAR AVERAGE)



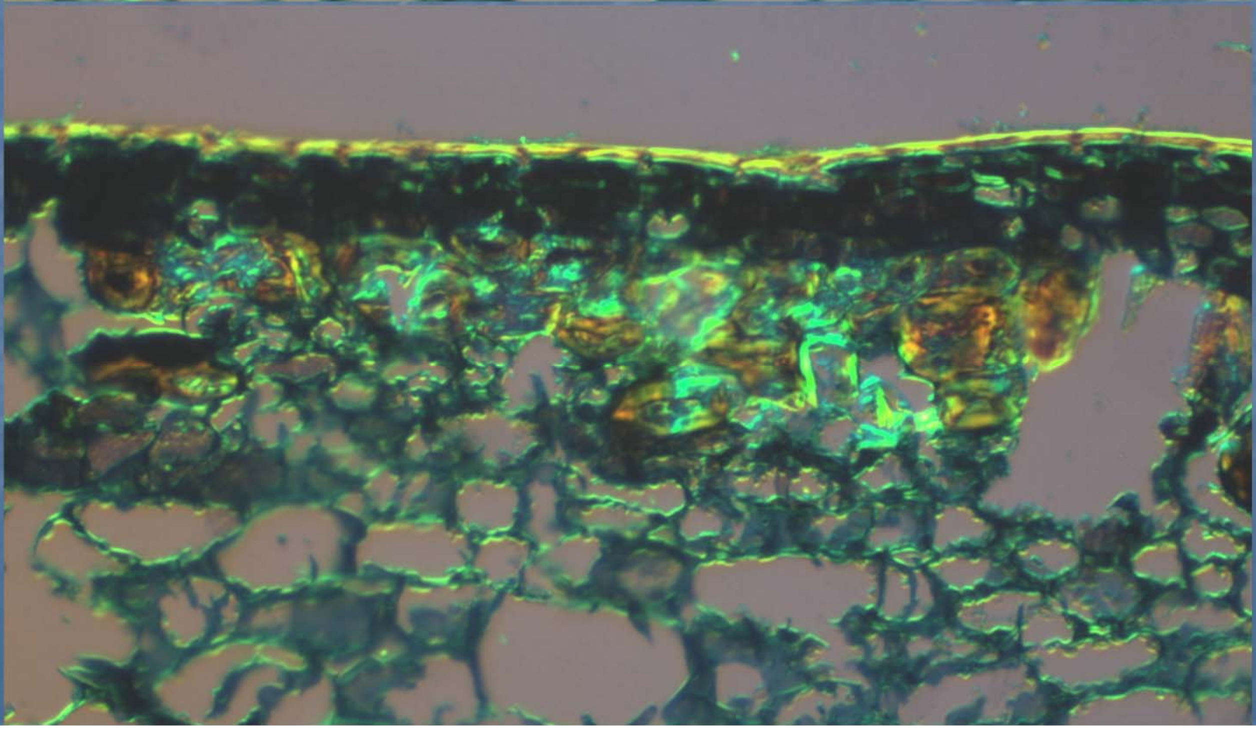
8 AND 9 DAT ARE FROM 2ND HARVEST



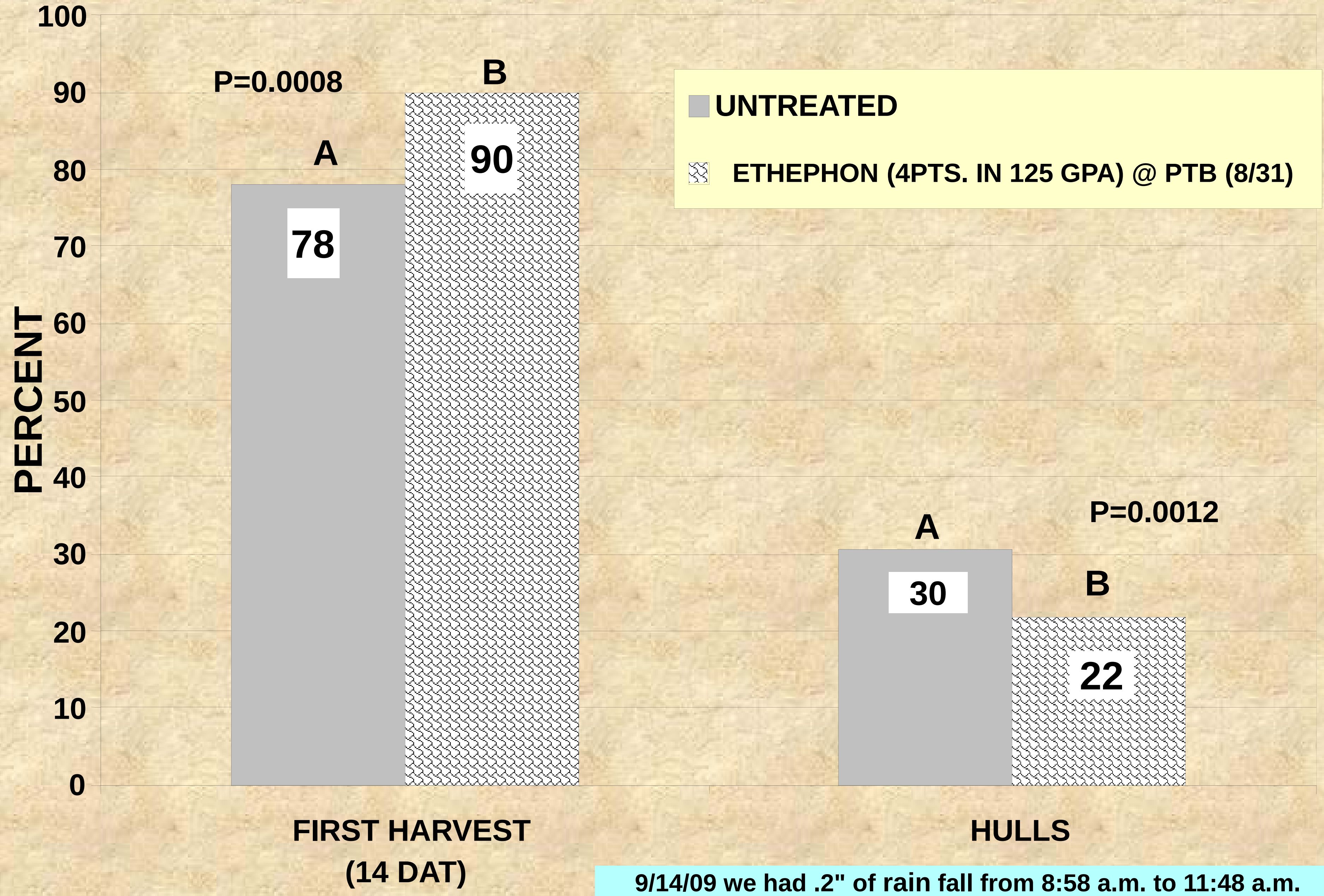
Serr



Payne

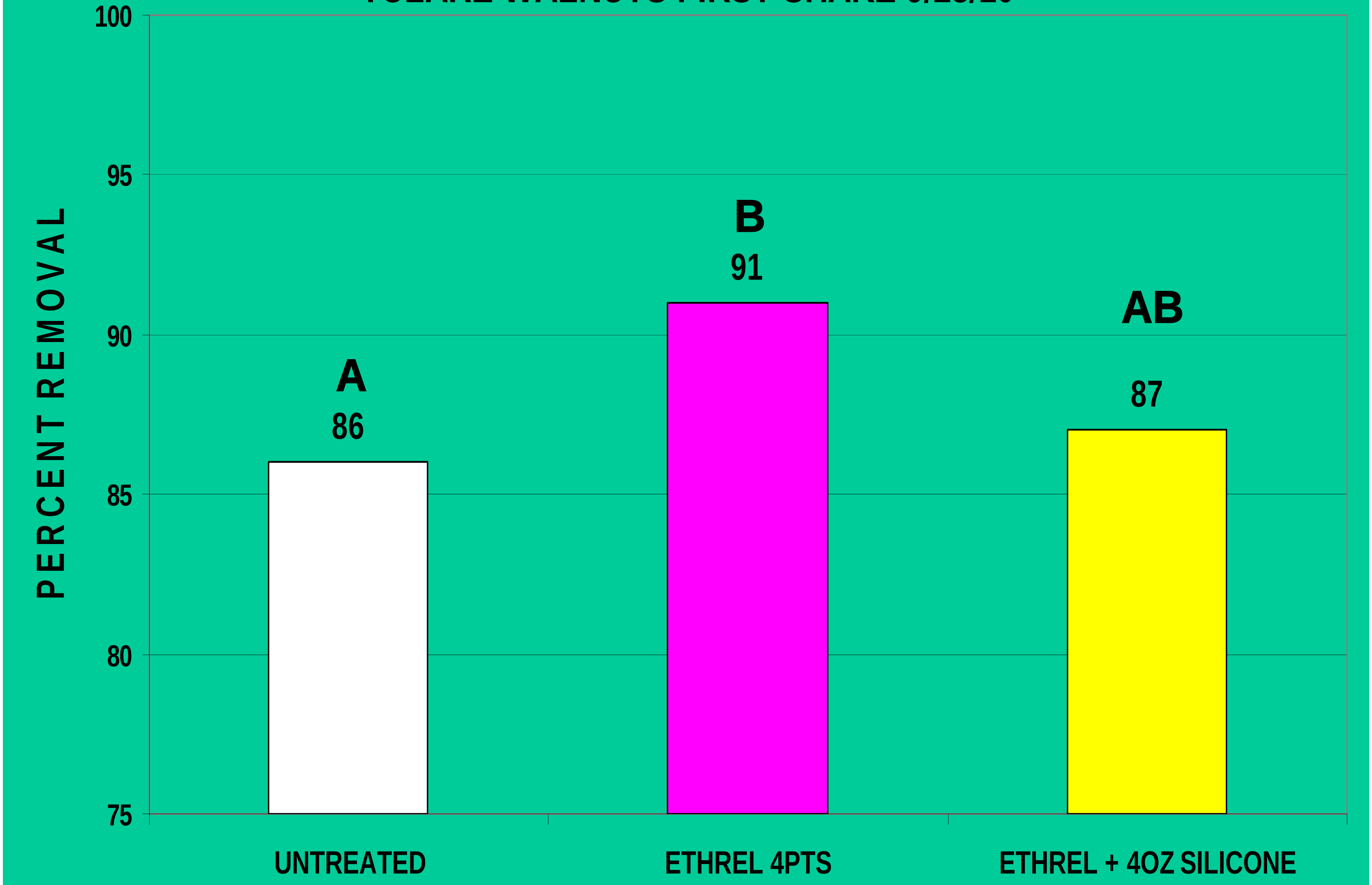


2009 ORCHARD ETHEPHON TRIAL: TULARE cv.



9/14/09 we had .2" of rain fall from 8:58 a.m. to 11:48 a.m.

WARMERDAM FARMS 2010 ETHREL TRIAL PERCENT REMOVAL
TULARE WALNUTS FIRST SHAKE 9/23/10



Ethrel Adjuvant Trial 2011

at the Kearney Ag Center

Seven Treatments applied by 9 AM on August 31, 2011.

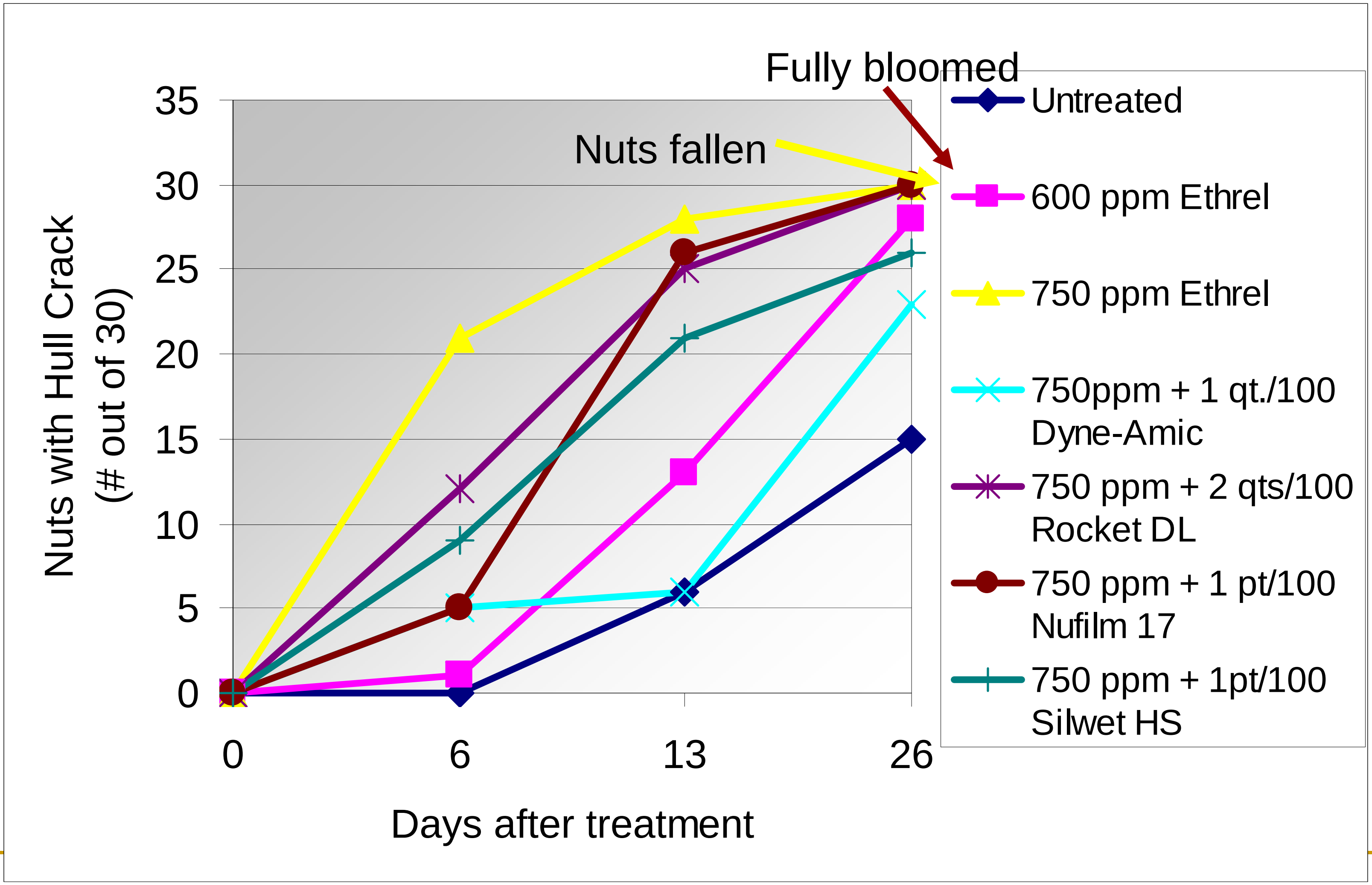
Variety: Serr

Temperature: 62° F

- ◆ **Untreated**
- ■ **600 ppm Ethrel**
- ▲ **750 ppm Ethrel**
- ✕ **750ppm + 1 qt./100 Dyne-Amic**
- ✳ **750 ppm + 2 qts/100 Rocket DL**
- ● **750 ppm + 1 pt/100 Nufilm 17**
- \+ **750 ppm + 1pt/100 Silwet HS**

Ethrel Adjuvant Trial 2011

at the Kearney Ag Center

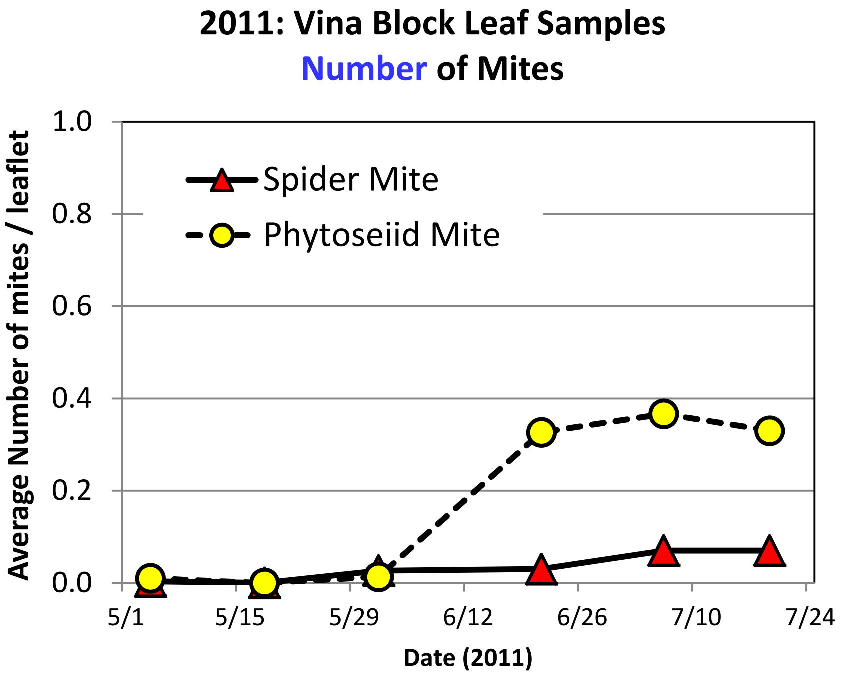


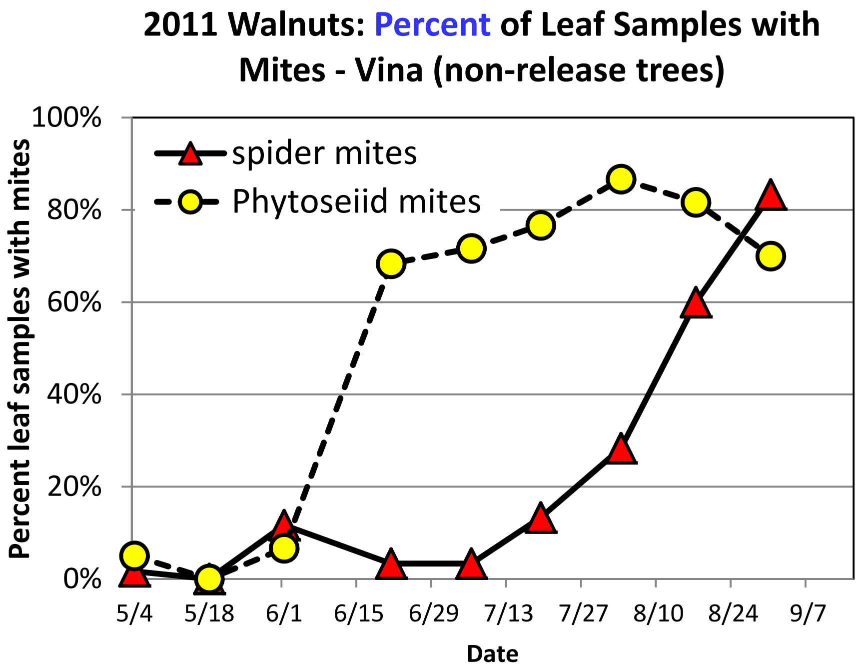
Biological Control of Spider Mites in Walnuts: Are we working on a false assumption?

Stephen C. Welter, Walt Bentley
and Frances Cave

Population development of mites in tree canopy

- Biweekly leaf samples 5/4 to 8/31
- 2 cultivars X 10 trees X 6 canopy locations X 5 leaflets/location





Observations (Vina block data only):

- Numbers/ leaflet low through mid July (<0.10 spider mites/leaflet)
- Phytoseiid numbers increase in June, (ratio Phytoseiid:SM ranges 5:1 to 10:1)
- Percent leaf samples with mites
  - Phytoseiids well dispersed June onward
  - Spider mites with rapid growth and dispersal in August

Phystoseiid Species Complex

1977 - Tulare County
McMurtry and Flaherty

- *Typhlodromus occidentalis* (= *Galendromus occidentalis*)
- *Typhlodromus citri*
- *Amblyseius hibisci*
- *Typhlodromus caudiglans*

2011 – Hanford walnuts
Welter, Bentley, Cave

- *Amblyseius similoides*
- *Euseius quetzali / Euseius tularensis*
- *Galendromus occidentalis* (<<1% of total sample)

Euseius sp.- generalist feeders on pollen, non-webbing mites, small insects , plant sap
- no association with *Tetranychus* mites

Amblyseius similoides - generalist feeder
-no known associations with spider mites

Potential food resources on leaf samples included pollen, tydeiid mites and thrips

Despite favorable ratios of phytoseiid mites to spider mites, it appears these species had little to no impact on the spider mite population

UC Statewide IPM Project
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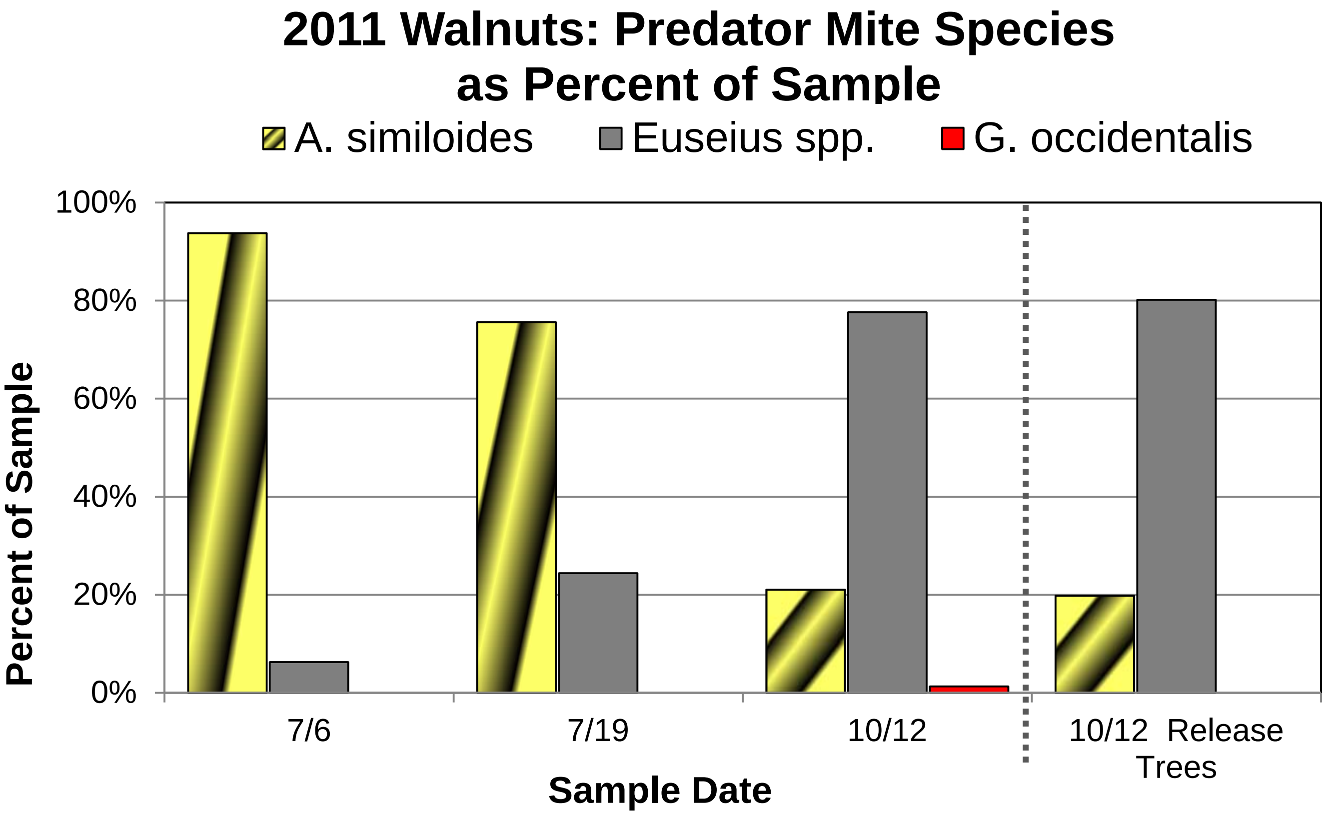
Phytoseiid mite composition

- Slide mounted all predator mites on leaf samples
- Graph indicates two timeframes: July, October (release and non-release)



Observations:

- Species shift *A. similoides* → *Euseius spp.*
- No recovery of *G. occidentalis* from release trees

Future Directions:

- Does predator species complex vary
  - Across regions?
  - Across orchards?
- What is responsible for the loss of *G. occidentalis* and other species from walnuts?
  - Mortality due to new chemistries?
  - Has reduction in OP use removed the selective advantage *G. occidentalis* once had?
- Can *G. occidentalis* be re-established through inoculative releases and management?
- Would other biocontrol organisms work in the walnut system?

Selective Pesticides and the Biological Control of Walnut Pests

Nick Mills
UC Berkeley

Linked with USDA-SCRI project
'Enhancing Western Orchard Biological Control'
WSU, UCB, USDA-ARS, OSU

Lab bioassays – Summary of effects

NE tested	effect measured	**Altacor**	**Cyazypyr**	**Delegate**	**Rimon**	**Warrior**	**Kumulus**	**Kocide/ Manzate**
Aphelinus mali								
	acute mortality, adult parasitoid	🟨	🟨	🟥	🟨	🟨	🟩	🟩
	population growth rate, r	🟩	🟨	🟥	🟩	🟨	🟩	🟩
Trioxys pallidus								
	acute mortality, aphid host	🟨	🟥	🟥	🟩	🟥	🟥	🟩
	acute mortality, adult parasitoid	🟩	🟥	🟥	🟩	🟥	🟨	🟩
	population growth rate, r	🟨	🟥	🟥	🟩	🟥	🟥	🟩
Deraeocoris brevis								
	acute mortality, nymph	🟩	🟩	🟩	🟥	🟥	🟩	🟩
	acute mortality, adult	🟩	🟩	🟩	🟩	🟥	🟩	🟩
	population growth rate, r	⬜	⬜	⬜	⬜	⬜	⬜	⬜
Chrysoperla carnea								
	acute mortality, larva	🟩	🟩	🟩	🟩	🟨	🟩	🟩
	acute mortality, adult	🟨	🟥	🟨	🟩	🟨	🟩	🟩
	population growth rate, r	🟨	🟥	🟩	🟥	🟥	🟩	🟩
Hippodamia convergens								
	acute mortality, larva	🟩	🟨	🟩	🟩	🟥	🟩	🟩
	acute mortality, adult	🟩	🟩	🟩	🟩	🟥	🟩	🟩
	population growth rate, r	⬜	⬜	⬜	⬜	⬜	⬜	⬜
Galendromus occidentalis								
	acute mortality, immature	🟩	🟩	🟩	🟩	🟥	🟥	🟩
	acute mortality, adult	🟩	🟩	🟥	🟨	🟥	🟩	🟨
	population growth rate, r	🟩	🟨	🟥	🟥	🟥	🟥	🟥
Pelegrina aeneola								
	acute mortality, immature	🟩	🟨	🟥	🟥	🟥	🟩	🟩
	acute mortality, adult	🟩	🟨	🟥	🟨	⬜	⬜	⬜
	population growth rate, r	🟩	🟨	🟥	🟨	⬜	⬜	⬜
Misumenops lepidus								
	acute mortality, immature	🟩	🟨	🟨	🟩	🟥	🟩	🟩

🟩	< 25%
🟨	25 - 75%
🟥	> 75%
⬜	incomplete

enhancedbiocontrol.org

Enhancing Western Orchard Biological Control

A multi-state, multi-agency SCRI project

Interactive Short Course

Course highlights:

- Discuss general principles of biological control in perennial crops with examples from apple, pear and walnut orchards.
- Engage in understanding and solving issues related to secondary pest outbreaks and the impact of invasive pests on IPM practices.
- Practice developing IPM programs and strategies that support biological control.
- Learn how to identify key natural enemies and pests they control.
- Discover new tools for monitoring natural enemies.
- Explore web resources and how they can help you to integrate biological control into your management strategy.
- Learn from new research the effects of pesticides on natural enemies.
- Understand the economic consequences of natural enemy removal in orchards.

Please join us for one of these 2-day event:

February 7-8, 2012

Wenatchee, WA, *Confluence Technology Center*
Pasco, WA, *ESD 123*
Hood River, OR, *The Pine Grove Grange Hall*

February 22-23, 2012

Stockton, CA, *Robert J. Cabral Agricultural Center*

THANK YOU!

QUESTIONS WELCOME
OVER LUNCH!