



# USDA/ARS-Industry Grape Research Workshop

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## Pest Management



# Pest Management

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- Participating Locations/States 13/11
- Number of ARS Scientists (10-100%) ~35
- Contributing CRIS projects ~14

# Pest Management

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Microorganisms

Insects

Post Harvest pest management

# Grape Pathology

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## Bacteria

- Xylella: genetics, ecology, biology
- Rhizosphere microbiology
- Replant Disease: soil micro-ecology

## Viruses

- ID new graft transmissible agents
- Viral involvement in graft incompatibility
- Development of diagnostic tools

## Fungi

- Powdery Mildew
- Gray Mold (*Botrytis cinerea*)

## Nematodes

- Root Knot
- Ring Nematode
- MeBr alternatives

Total: ~14 scientists engaged, full or part time  
in Viticulture-related Pathology

# Bacteria

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- *X. fastidiosa* behavior in-planta, in sap biofilm in sap from resist. and suscept. Grape gene expression as function of susc vs resistant genotype (Hong Lin)
- SNP genotyping, diversity, genetic structure of populations, almond vs grape Xf isolates, plasmid content, bacteria phages  
(J.C. Chen/H. Lin/Drake Strenger)
- Rhizosphere microbiology, community analysis, culturable & nonculturable components  
(Steenwerth/Kluepfel)

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# Powdery Mildew

## *(Erysiphe necator)*

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**Biology; temp. & leaf wetness effects epidemiology, refinement of Gubler -Thomas P.M. Model (wet climates) (Walt Mahaffee)**

**Develop molecular markers for DMI resistance, (*cyp51*) (Mahaffee)**

**Identification of powdery mildew resistant cultivars in collaboration with grape breeders (Joe Smilanick)**

# Gray Mold/Bunch Rot

## *(Botrytis cinerea)*

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Identify and characterize Gray Mold resistant cultivars in collaboration with grape breeders (Joe Smilanick)

Characterize the colonization/infection of grapes by GFP-labeled *B. cinerea* (W. Mahaffee)

Early detection protocols (Lance Cadle-Davidson)

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# Virus Projects

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Causes of Young vine decline, characterizes new GTA  
ID/characterize Red globe virus, table grape  
Discovery of new viruses. Syrah decline  
(New SY, J. Uyemoto (retired); K. Steenwerth)

Rupestris stem pitting virus (St. George root stock),  
grapevine leaf roll 1, 2 & 3); insect transmission  
w/vine mealy bug (Bob Martin)

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# Nematology

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**Large scale surveys identify economically important spp (e.g. Ring Nematode); Breeding root stock for root knot nematode resistance (Jack Pinkerton, Paul Schreiner)**

**Impact of vineyard floor management practices on nematode communities in grape rhizosphere (Dan Kluepfel)**

**MeBr Alternatives (i.e. fumigants) for use in Nurseries, develop for nematode-free certification; examine replant disease (New PI; Sally Schneider)**

**Develop preplant MeBr Alternatives for grapes. (Dong Wang)**

# Insects

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**Glassy-Winged Sharpshooter (15)**

**Other (1)**

**Parasitoids (6)**

**Blue-Green Sharpshooter**

**Biology/Ecology/Genetics (9)**

# Glassy-Winged Sharpshooter

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## Parasitoids

- **Search and evaluation of new egg parasitoids**  
(John Goolsby)
- **DNA fingerprinting to distinguish 10 spp of GWSS egg parasitoids** (Jesse de Leon)
- **Mass rearing of *Gonatocerus* (wasp parasitoid) on “cold-killed” GWSS eggs** (Roger Leopold)
- **Develop artificial diet for *Gonatocerus* (wasp)** (Tom Coudron)

# Glassy-Winged Sharpshooter

## Biology/Physiology

- **Chemical ecology/volatile attractants/visual cues**  
(Joe Patt)
- **Pop. Genetics/molec systematics of GWSS** (Jesse de Leon)
- **Feeding mechanisms/X.f. transmission** (Elaine Backus)
- **Developing degree-day cooling model- predict overwintering survival of GWSS** (Mark Sisterson)

# Glassy-Winged Sharpshooter

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## Biology

- **cDNA libraries as function of life stage/tissue, examine gene responses to biotic and abiotic stresses (20K EST's); GWSS response to temp, viral pathogen infections, tissue, development. (Wayne Hunter)**
- **Development of artificial diet for GWSS (Tom Coudron)**
- **Develop protein (antibody) marking system for GWSS, (James Hagler Jackie Blackmer )**

# The “Other” sharpshooter

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- Involvement of riparian hosts in Blue-Green Sharp Shooter mediated *X. f.* transmission and PD incidence (Kendra Baumgartner)

# Control Post Harvest/Quarantine Pests

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- **Postharvest control using chemical, physical, or biocontrol agents (table grapes) (Joe Smilanick)**
- **Alternatives to chemical control for stored products and quarantine pests of fresh/dried fruits and nuts. (e.g. Indian meal moths, raisin moth) (J. Johnson, C. Burks, L Kuenen, J. Leesch, J. Siegel, V. Yokoyama)**
- **Chemically based methods as alternative to methyl bromide for postharvest and quarantine pests. (J. Leesch, C. Burks, L. Kuenen, J. Siegel, V. Yokoyama)**

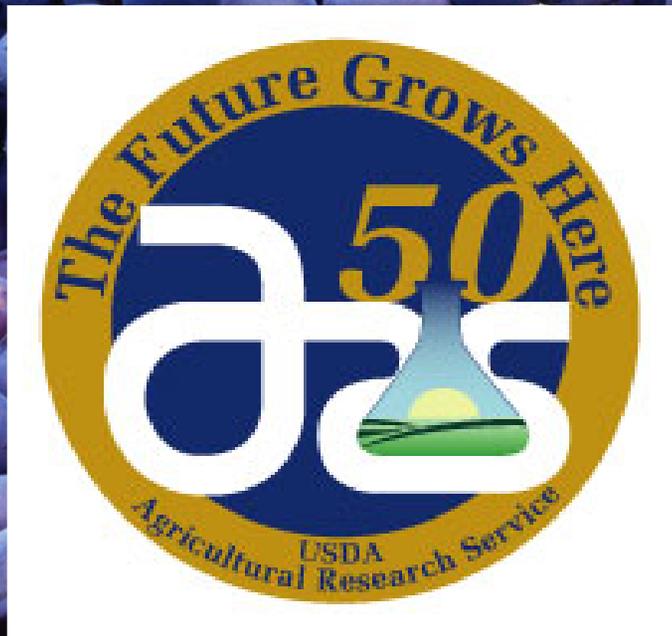


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## Pest Management





# Other Fungal Pathogens of interest

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**Armillaria Root Disease-development of cultural and biological control mechanisms**

(Kendra Baumgartner)