



USDA/ARS-Industry Grape Research Workshop

Pest Management



Pest Management

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



Pest Management

Microorganisms

Insects

Post Harvest pest management

Grape Pathology

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

- *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)

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*)

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

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

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

Glassy-Winged Sharpshooter (15)

Other (1)

Parasitoids (6)

Blue-Green Sharpshooter

Biology/Ecology/Genetics (9)

Glassy-Winged Sharpshooter

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

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

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

Control Post Harvest/Quarantine Pests

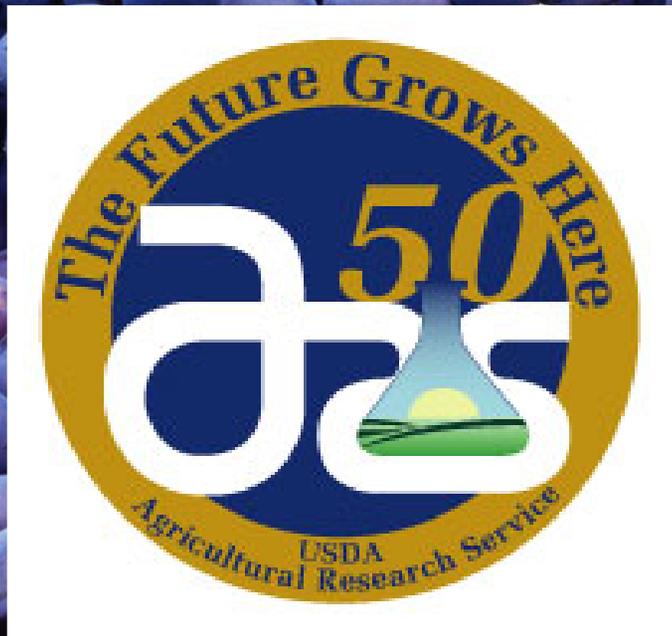
- **Postharvest control using chemical, physical, or biocontrol agents (table grapes) (Joe Smilanick)**
- **Alternatives to chemical control for stored products and quarantine pests of fresh/dried fruits and nuts. (e.g. Indian meal moths, raisin moth) (J. Johnson, C. Burks, L Kuenen, J. Leesch, J. Siegel, 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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Other Fungal Pathogens of interest

Armillaria Root Disease-development of cultural and biological control mechanisms

(Kendra Baumgartner)