April-June 2007

Volume 1 Issue 3

UPDATE

San Joaquin Valley Agricultural Sciences Center

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Special points of interest:

- Dr. Victoria Yokoyama—"Celebrating 22 Years of Quarantine Research"
- California Specialty Crops Tour to stop at the San Joaquin Valley Agricultural Sciences Center on July 17, 2007.

Introduction

There have been several significant accomplishments of ARS scientists at the San Joaquin Valley Agricultural Sciences Center during this current fiscal year. These include development of (1) improved diagnostics for *Xylella fastidiosa* and *Spiroplasma citri*; (2) a simple cost-benefit analysis tool to assist growers in management of almond leaf scorch diseases; (3) improved ability to screen for resistance to Pierce's disease in interspecies crosses of *Vitis* germplasm; and (4) a non-destructive, UV light-based method to detect freeze-damage oranges on the packing line. In addition, research also demonstrated that (1) ozone is effective in eliminating black widow spiders from table grapes; (2) entomopathogenic nematodes (combined with a chemical agent) can dramatically reduce overwintering populations of navel orangeworm; (3) several emerging chemicals controlled soilborne pathogens as well methyl bromide; and (4) several surface treatments significantly reduced fumigant emissions. Finally, based on previous research by researchers at the Center, a parasitic wasp from Guatemala was successfully released to control olive fruit fly throughout California.

Current Research Highlights

Commodity Protection and Quality Research Unit

Victoria Yokoyama, Research Entomologist, presented an in-house seminar titled, "Celebrating 22 Years of Quarantine Research," that chronicled past work with **Gina T. Miller**, Biological Science Technician. The seminar featured quarantine strategies that had been developed to control regulated pests in commodities produced in the western states and exported to Pacific Rim countries. Highlights of the presentation included the first in-carton fumigation, accepted in 1995, to control codling moth in nectarines shipped to Japan. Methods to develop a quarantine treatment for oriental fruit moth in stone fruits exported to British Columbia were presented and a modified low temperature storage treatment for exports to Mexico was described.

Current Research Highlights (continued)

Commodity Protection and Quality continued—

Dr. Yokoyama showed the evolution of a five-year project to develop a pest-free period and poor host status of stone fruits for a native fruit fly, walnut husk fly, which allowed market access to several Pacific Rim countries from 1995-2003. Emphasis was placed on the need to protect the $520 million hay export market to Asia and the continuous development of quarantine treatments to control Hessian fly and other emerging pests that may hinder domestic and foreign shipments of hay. **Dr. Yokoyama** presented the most recent quarantine treatments developed for the Japan market, including large-size hay bales in wrappers that was approved in 2004. The seminar presented the new biological control program for olive fruit fly in California that emerged from cooperative work with the USDA-APHIS-PPQ in Guatemala. **Dr. Yokoyama's** research program in the past 22 years has been supported in part by the California Tree Fruit Agreement, The National Hay Association, the California Olive Committee, California Department of Food and Agriculture, growers, processors, and exporters.

David Obenland, in cooperation with **Dr. Mary Lu Arpaia** and **Dr. Michael O'Mahoney** from the University of California, is performing research to evaluate the current maturity standard that determines when navel oranges are harvested in California.

Joe Smilanick will be traveling to French Polynesia in August to test the effectiveness of ozone to control coffee rust transmitted by the coffee berry borer. This work is being conducted in cooperation with **Jack Armstrong** of the ARS Hilo Laboratory in Hawaii.

Water Management Research Unit

Jim Gerik, Brad Hanson, and Dong Wang will each be leading a research project during the next three years under the Pacific Area Wide Pest Management Program for Methyl Bromide Alternatives. **Dr. Gerik** is a Research Plant Pathologist and the project for which he is responsible titled "*Technology transfer methods for adoption of methyl bromide alternatives in California cut flower and bulb crops*." **Dr. Hanson** is a Research Agronomist/Weed Scientist and he will be studying "*Efficacy and 1,3-D emissions with approved nursery stock certification treatments applied with two shank designs*." **Dr. Wang** is a Soil Scientist and Research Leader of the Water Management Research Unit, and he will be leading a project to investigate "*Methyl bromide alternatives for vineyard replant – assessment of control efficacy, fumigant movement, and crop response.*" **Dr. Suduan Gao**, a Research Soil Scientist from the Unit, and a number of other researchers from the UC, other ARS locations, and the industry will also be participating as collaborators in these projects.

Gary Bañuelos focuses his research on the derivation and novel utilization of potential phtyo-products produced from *Brassica* plants grown for remediation of selenium (Se)-enriched soils in Central California. He has shown that potential crops used for the phytoextraction of Se in Central California include crops such as broccoli (*Brassica oleraea*), canola (*B. napus*) and mustard (*B. juncea*). However, in addition to removing Se from soil, Se-enriched crops may be harvested for potentially economic products, including Se-rich plant material for animal feed supplements or edible vegetables. **Dr. Bañuelos** is also researching other commodity options, such as the production of biofuel using extracted canola or mustard oil mixed with diesel fuel, and using seed by-products after oil extraction for animal feed and as a biological herbicide, respectively.

Current Research Highlights (continued)

Crop Diseases Pests and Genetics Research Unit

Ray Yokomi has joined efforts with the UC Lindcove Research and Extension Center (LREC) near Exeter, the Citrus Clonal Protection Program (CCPP) and the Central California Tristeza Eradication Agency (CCTEA) to identify the genotype(s), and determine the vector transmissibility of citrus tristeza virus (CTV) isolates associated with a significant increase in infection of trees at the LREC this year. This year's infection rate is threatening the virus-free status of the CCPP foundation budwood source orchard and screenhouse trees which are housed at the LREC. In addition, research plots at the LREC are also threatened. The CCPP orchard has over 100 selections of citrus and is the primary source of virus-free budwood to California nurserymen.

National Arid Land Plant Genetic Research Unit

It's been a year of transition for NALPGRU. **Maria Jenderek** has departed to accept a position at Fort Collins CO and **Allan Brown** has arrived to assume her responsibilities. It's also been a busy year: NALPGRU's regeneration efforts on behalf of the National Plant Germplasm System reached an all time high this year with over 2000 climate specific accessions of various species regenerated as a service for their primary sites. **Jerry Serimian**, Research Technician, was recognized for his special contributions to NALPGRU with an NPGS Achievement award that was presented last month at the PGOC meeting in Beltsville, MD. **Melissa McPherson**, Research Aid, who has also departed to finish her education as a primary school teacher, was also awarded a spot award for her contributions to the GRIN network. The first genetic diversity estimates of Meadowfoam has recently been completed by NALPGRU using RAPD markers and marks the transition of NALPGRU toward a more molecular future. Research projects that have recently been initiated include a survey of rubber/latex content in the USDA guayule collection, the determination of ploidy levels of the collections of guayule and lesquerella, glucosinolate content of meadowfoam and lesquerella accessions, and the development of SSR markers in guayule to determine diversity within the USDA collection.

Meetings, Conferences, Workshops & Visitors

Jim Gerik participated in the Floricultural Teaching Schools in Salinas and Ventura on May 15 and May 30, 2007.

A seminar was organized by **Joe Smilanick** and presented on June 6, 2007 by 2 visiting scientists, **Professor Ivan Pejic** and **Professor Edi Maltic** from the Faculty of Agriculture, University of Zagreb, Croatia. The seminar was titled "Zinfandel Origin—State of the Art."

News

Allan Brown reported for duty as the Acting Curator for the National Arid Land Plant Genetics Resources Research Unit in April 2007.

Rodrigo Krugner, Research Entomologist, will report for duty in the Crop Diseases, Pests and Genetics Research Unit on September 17, 2007.

Upcoming Events

The 2007 Annual California Specialty Crops (formerly California Minor Crop Council) Tour will be held July 16-19, 2007. The tour will stop at the San Joaquin Valley Agricultural Sciences Center on July 17th for an afternoon presentation.

Ed Civerolo, Hong Lin, David Ramming, Dong Wang, Jim Leesch and Drake Stenger will participate in an ARS-Industry Grape Workshop in Kennewick, WA on July 24-25, 2007. This Workshop will be sponsored by ARS in response to the National Grape and Wine Initiative. The purpose of the Workshop is to present an update of ARS accomplishments in grape/wine research that addresses industry needs; present an update on changes in industry needs and priorities; build collaborative relationships for integrated research projects that span disciplines, locations and sectors (government, industry, university, and extension); and develop a strategy for future research.

The 2007 Annual Meeting of the American Phytopathological Society will be held in San Diego, California on July 28-August 1.

Recent Publications

- Yao, J., H. Lin, H. Doddapaneni and E.L. Civerolo. 2007. nWayComp: A genome-wide sequence comparison tool for multiple strains/species of phylogenetically related microorganisms. *In Silico* Biology 7, 020, 6 pages.
- Shaner, D.L., Henry, W.B., Hanson, B.D., Krutz, L.J. 2007. Rapid assay for detecting enhanced atrizine degradation in soil. Weed Science.
- Wang, D., He, J., Knuteson, J. 2007 DripFume: A Visual Basic Program for Simulating Distribution and Atmospheric Volatilization of Soil Fumigants Applied Through Drip Irrigation. Computers and Electronics in Agriculture, Vol 56 (2007) 111-119.
- Zhang, Y., Wang, D. 2007. Emissions, Distribution and Leaching of Methyl Isothiocyanate and Chloropicrin Under Different Surface Containment. Chemosphere 68 (2007) 445-454.
- Candole, B. L., Csinos, A.S., Wang, D. 2007. Distribution and Efficacy of Drip-Applied Metam-Sodium Against Rhizoctonia Solani and Yellow Nutsedge in Plastic-Mulched Sandy Soil Beds. Pest Management Science, 63:468-475.

Research Units and Contact Information

Water Management Research Unit

Commodity Protection & Quality Research Unit

Crop Diseases, Pests & Genetics Research Unit

National Arid Land Plant Genetic Resources Unit

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