

RESEARCH PROJECTS WITH POSTHARVEST COMPONENT

Row Crop/Other

Project: 461 Specialty Crops Development and Variety Evaluation for the San Joaquin Valley

Project Leader: Manuel Jimenez, Farm Advisor, UC Cooperative Extension, Tulare County

Objective: To provide research based information on new specialty crops for the small scale growers of the San Joaquin Valley.

Project: 851 Specialty Small Fruit Evaluations

Project Leader: Manuel Jimenez, Farm Advisor, UC Cooperative Extension, Tulare County

Objective: The initial objective was to establish a blueberry and blackberry planting to make preliminary evaluations on growing blueberries and blackberries. From those preliminary studies many growers planted these crops commercially. To assist clientele with these new crops it will be necessary to conduct much more detailed research trials. The recently established trials will go a long way to improve productivity and therefore profitability for blueberry growers.

Project: 856 Annual Specialty Vegetable Research

Project Leader: Richard Molinar, Farm Advisor, UC Cooperative Extension, Fresno County

Objective: To identify new and/or improved annual specialty crops that will improve the economic returns to the small farmer, and to investigate technologies including pest management that the small farm operator can adopt.

Project: 857 Perennial Specialty Crop Research

Project Leader: Richard Molinar, Farm Advisor, UC Cooperative Extension, Fresno County

Objective: To identify new and/or improved perennial specialty crops that will benefit the economic returns to the small farmer, and to investigate technologies including pest management that the small farm operator can adopt.

Project: 1010 IR4 Kearney Field Research Center

Project Leader: Fred H. Swanson, Field Research Center Project Leader, Kearney Research and Extension Center

Objective: 1. To conduct annually 30-40 Magnitude of the Residue field trials in support of the IR4 program according to U.S. EPA Residue Chemistry Guidelines (Series 860.1500) and compliant with FIFRA Good Laboratory Practice standards to satisfy the registration data requirements of federal and state regulatory agencies. 2. To report efficacy and phytotoxicity results.

Tree Crops

Project: 054 Aflatoxin Control in Figs: Biocontrol and New Resistant Cultivars

Project Leader: Themis Michailides, Ph.D., Plant Pathologist, Department of Plant Pathology, UC Davis, Kearney Agricultural Center

- Objective:** Continue studies on the biocontrol of aflatoxin-producing fungi using an atoxigenic *A. flavus*. Evaluate new fig selections for resistance to aflatoxin contamination.
- Project :** **058 Prediction of Brown Rot in French Prunes in California**
Project Leader: *Themis Michailides, Ph.D., Plant Pathologist, Department of Plant Pathology, UC Davis, Kearney Agricultural Center*
- Objective:** Develop a simple method to estimate inoculum potential in orchards. Establish the inoculum-potential database for dried plum orchards using the GIS system.
- Project:** **203 Fungal Diseases of Kerman Pistachios**
Project Leader: *Themis Michailides, Ph.D., Plant Pathologist, Department of Plant Pathology, UC Davis, Kearney Agricultural Center*
- Objective:** Follow the survival of atoxigenic strains previously applied in a pistachio orchard. initiate an additional biocontrol experiment using the atoxigenic strain AF36 in another pistachio orchard irrigated by micro-sprinklers. Determine the incidence of the atoxigenic strain AF36 among isolates from commercial pistachio orchards.
- Project:** **312 Studies on Fruit and Nut Quality and Safety Affected by Postharvest Management**
Project Leader: *Carlos Crisosto, Ph.D., Pomologist, Department of Pomology, UC Davis, Kearney Agricultural Center*
- Objective:** 1. Better define components of quality (appearance, texture, organoleptic traits or FOTs, nutritive value) and their interrelationships for various fruits, nuts and vegetables destined for the fresh market or for processing. 2. Develop objective and non-destructive methods for determination of appearance and textural quality and optimum maturity of fruits, nuts and vegetables. 3. Evaluate the effects of preharvest factors (genetic, environmental, and cultural) and postharvest procedures on organoleptic traits, nutritional quality, and physiological disorders of fruits and nuts.
- Project:** **454 The Incidence of Botrytis Gray Mold by Botrytis Cinerea on Kiwifruit**
Project Leader: *Themis Michailides, Ph.D., Plant Pathologist, Department of Plant Pathology, UC Davis, Kearney Agricultural Center*
- Objective:** Determine the stages of susceptibility of kiwifruit (starting with the flower stage) to *Botrytis cinerea*.
- Project:** **750 Evaluation of Cultural, Biological and New Chemical Pre and Postharvest Brown Rot on Stonefruit**
Project Leader: *Themis Michailides, Ph.D., Plant Pathologist, Department of Plant Pathology, UC Davis, Kearney Agricultural Center*
- Objective:** Monitor environmental conditions in stone fruit orchards to predict blossom blight. Predict brown rot at harvest and postharvest based on the incidence of latent infections. Study various alternative strategies of brown rot control by suppressing primary and secondary inoculum sources in the spring and summer, reducing survival of mummified fruit, and use biocontrol agents to reduce brown rot.

Project: **757 Management and epidemiology of Stone Fruit and Almond Diseases in California**
Project Leader: *James E. Adaskaveg, Ph.D., Associate Professor, Department of Plant Pathology, UC Riverside*
Objective: Evaluate bloom and preharvest applications of new compounds (e.g., fungicides) and biological products as compared to registered fungicides for control of brown rot blossom blight and pre- and postharvest brown rot fruit decay. Determine the efficacy of new fungicides and biological products as postharvest treatments. Evaluate new postharvest application methods, including in-line drenching systems, and roller-bed applications. Develop rapid antibody-based assays for determining concentrations of fludioxonil in mixing tanks and on fruit. Incidence of *Geotrichum candidum* on stone fruits with sour rot-like symptoms. In vitro evaluations of registered and experimental sanitizers and fungicides. Toxicity of sanitizers on handling equipment and efficacy of sanitizers and fungicides for management of sour rot on stone fruits.

Project: **2012 Understanding Genetic Control of Tree Fruit Quality with Emphasis on Fruit Mealiness**
Project Leader: *Carlos H. Crisosto, Ph.D., Pomologist, Department of Pomology, UC Davis, Kearney Agricultural Center*
Objective: The goal of this research is to identify important genes controlling expression of the fruit organoleptic traits (FOTs) that define fruit quality of peach, and to develop molecular tools for enhancing genetic improvement of fruit quality with emphasis on fruit mealiness through molecular and classical breeding. The specific objectives of this proposal are to: 1. Identify and locate i) QTLs controlling fruit mealiness, acidity, soluble solids consisting of various sugars, fruit firmness and fruit size, and ii) the F (freestone), M (melting), and (soft) loci that distinguish clingstone, non-melting canning peaches from freestone, melting dessert peaches. 2. Quantify the phenotypes resulting from interaction among the genes controlling the F (freestone), M (melting), St (soft) and Y (yellow flesh) loci, and the QTLs that produce the genetic variability for fruit mealiness, acidity, soluble solids, fruit firmness and fruit size, so as to enhance the understanding of how new cultivars with high quality fruit can be bred. 3. Develop molecular marker tags for major loci and QTLs controlling these important FOTs for use in marker-aided selection for enhanced fruit quality of peaches/nectarines.

Project: **0506 Epidemiology and Management of Gray Mold of Kiwi in California**
Project Leader: *James E. Adaskaveg, Ph.D., Associate Professor, Department of Plant Pathology, UC Riverside*
Objective: 1. Preharvest treatments for postharvest decay control- Evaluate new reduced-risk fungicides (e.g., pyrimethanil-Scala, cyprodinil-Vangard, fenhexamid-Elevate, pyraclostrobin/boscalid - Pristine) and biological controls (*Trichoderma* spp.- PlantShield, Bio-Trek) as preharvest treatments for postharvest decay management. 2. Postharvest treatments - Evaluate new reduced-risk fungicides (e.g., pyrimethanil-Penbotec, cyprodinil-Vangard, fenhexamid-Elevate, fludioxonil-Scholar, pyraclostrobin/boscalid - Pristine) and biological controls (*Trichoderma* spp.- PlantShield, Bio-Trek, Arabesque) as postharvest treatments for decay management. 3. Continue to cooperate with commercial packinghouses on postharvest applications of fungicides pending registration of fenhexamid (Section 3 or Section 18) or fludioxonil (Section 3).

Vine Crops

Project: 102A Wine Grape Cultural Practices

Project Leader: *Matthew Fidelibus, Ph.D., Viticulture Specialist, Department of Viticulture and Enology, UC Davis, Kearney Agricultural Center*

Objective: 1. Compare the yield, fruit quality, canopy characteristics and fruit zone microclimate of Chardonnay grapevines grown under six modern wine grape trellis/training systems used in California. 2. Determine the effects of in-row spacing on the yield, fruit quality, canopy characteristics and fruit zone microclimate of Syrah grapevines. Examine potential interactions among in-row spacing, training systems and balanced pruning levels on vine performance and production efficiency.

Project: 808A Table Grape Cultural Practices

Project Leader: *Matthew Fidelibus, Ph.D., Viticulture Specialist, Department of Viticulture and Enology, UC Davis, Kearney Agricultural Center*

Objective: Compare the productivity, fruit quality and canopy characteristics of Thompson Seedless table grapes trellised to the open gable and traditional "T" trellis systems. Determine the effects of canopy separation on the productivity of Thompson Seedless table grapes trellised to the open gable system. Determine the interaction between in-row spacing and vine training method on the yield and fruit quality of Crimson Seedless table grapes.

Project: 0302 Infection of Grape Nursery Stock by *Botrytis cinerea* in Cold Storage and its Control

Project Leader: *Themis Michailides, Ph.D., Plant Pathologist, Department of Plant Pathology, UC Davis, Kearney Agricultural Center*

Objective: 1. Perform Koch's postulates (prove that *Botrytis cinerea* causes the problem). 2. Determine when nursery stock becomes infected by *B. cinerea* and how the disease develops in cold storage. 3. Develop control methods of the disease.

Project: 0306 Raisin Research

Project Leader: *Matthew Fidelibus, Ph.D., Viticulture Specialist, Department of Viticulture and Enology, UC Davis, Kearney Agricultural Center*

Objective: Evaluate new raisin selections for early maturity and DOV performance. Determine the best vine training and trellising systems for potential DOV cultivars. Develop complete DOV systems that integrate cultivar, trellis and equipment. Determine the effect of DOV practices on vine physiology, including canopy leaf area and photosynthesis.