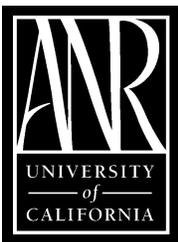


UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION
KERN COUNTY FARM AND HOME ADVISORS
2005 ANNUAL REPORT



University of California
Agriculture & Natural Resources

Cooperative Extension Kern County



UC Cooperative Extension Kern County Farm and Home Advisors

1031 S. Mt. Vernon Avenue
Bakersfield, CA 93307

Phone: 661-868-6200
Fax: 661-868-6208

E-mail: cekern@ucdavis.edu
Web site: www.cekern.ucdavis.edu

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Who We Are and What We Do

Cooperative Extension is the informal off-campus educational arm of the University of California. We are a part of the Land-Grant College System that, since 1914, has provided the citizens of California and Kern County with programs to improve their quality of living. Our informal educational programs have focused on: (1) agriculture and natural resources; (2) family and consumer sciences; (3) community resource development; and (4) 4-H youth development.

In Kern County, we are most commonly recognized as the Farm and Home Advisors Office. Cooperative Extension advisors are your local representatives of the University of California and the resources of the institution are as close as your telephone and a local call.

We have over 3,000 different University, U.S.D.A., and locally produced publications, most of which are provided with little or no charge. Advisors are available for consultation on your particular problem at no charge.

Cooperative Extension provides homeowners and urban gardeners information on a wide variety of subjects such as gardening, home orchards, house plants, pest control, diagnosis of problems, etc.

- ▶ The **4-H Youth Program** is locally administered through the Cooperative Extension Office. Over 1,200 Kern County youth between kindergarten and age 19 are currently enrolled. Over 400 adult volunteer leaders assist with this program.
- ▶ **Farm advisors** with various commodity and livestock assignments work primarily with commercial agriculture to improve production and quality, and to enable consumers to enjoy a reasonably priced, wholesome and nutritional food supply. Their experience and knowledge are extended to the urban public through publications and consultations.
- ▶ **Environmental Horticulture.** Shade trees and turfgrass make city and suburban areas more livable. The environmental horticulturist provides problem-solving information related to ornamental plants and home fruit and vegetable production. A Master Gardener program provides further education and outreach opportunities.
- ▶ The **Nutrition, Family, and Consumer Science Advisor**, using the “Train the Trainer” model, instructs professionals, agency staff, and community volunteers to conduct a broad array of family and consumer education programs. These include money management, parenting, lead poisoning prevention, and family literacy. The Nutrition, Family Consumer Science Advisor also answers consumers’ questions regarding food safety and food preservation.
- ▶ An **Expanded Food and Nutrition Education Program** is directed at those families near and below the poverty income level. The main thrust of this program is teaching nutrition, food preparation and shopping skills. The Youth EFNEP program provides nutrition curriculum and training to schools serving low-income children.

Letter from the Director

Darlene Liesch, County Director

As President Dynes, our University of California president, toured throughout California this past year visiting with growers, ranchers and collaborators, his knowledge and appreciation of Cooperative Extension and the work accomplished in California increased. He stated on March 4th in Southern California “The best example of technology transfer I have ever seen is here, Cooperative Extension”.



Recently, when President Dynes spoke at a breakfast in Fresno, he again talked about the importance of Cooperative Extension and its ability to deliver research information to the people.

The Mission of UC’s Division of Agriculture and Natural Resources, of which we are a part, is “To serve California through the creation, development and application of knowledge in agricultural, natural and human resources”. What President Dynes appreciates about Cooperative Extension is the part in our Mission that relates to the application or extension of the knowledge to our clientele. In Kern County, the University of California Cooperative Extension is the Farm and Home Advisors Department. So in this case, that extension of information goes to the citizens of Kern County. Our Farm Advisors, Family and Consumer Science Advisor, and 4-H Youth Development Advisor have strong research programs benefiting Kern County. This annual report highlights some of them.

In 2005, our department made a concerted effort to use new technology and additional delivery methods to extend information to the public. One example of this is when we videotaped a farm advisor pruning a citrus tree. The advisor scripted over the tape and the tape was made into an educational CD which is now available through our department as a “publication”. The same information was put on a PowerPoint presentation and played on KGOV during the pruning season, reaching thousands of viewers throughout Kern County. The 4-H Youth Development Program has also been broadcast on KGOV with information about the program and how to participate. Currently, two other educational programs are in the production stages.

Our website contains information and current newsletters for easy access by all Kern County residents. In the future we will be working on ways to use the website for feedback surveys.

All of this is in addition to our traditional informational meetings, field days, events, news releases, newsletters, and phone and counter calls.

When some people think of the University of California, they only think of the ten campuses and the creation and development of information that takes place there. Cooperative Extension is at your doorstep providing research based information in agriculture, family and consumer science and youth development - all from a local perspective. As President Dyes commented, Cooperative Extension is not only about the research and development, it is also about delivery. In Kern County, we deliver.

For additional information, please do not hesitate to give me, or one of our advisors, a call.

Darlene Liesch
County Director

Citrus, Pistachios and Subtropical Fruit

Craig Kallsen, Farm Advisor

General Program Description

The Kern County Farm Advisor for subtropical horticulture is responsible for research and an educational outreach program for Kern County growers and pest control advisors of citrus (approximately 60,000 acres) and pistachios (approximately 55,000 acres) primarily, as well as for miscellaneous permanent crops such as persimmons, pomegranates, olives and figs.



Applied Research

PISTACHIO SHORT COURSE EXTENSION PROJECT

A highlight of the Kern County pistachio program this year was the University of California Pistachio Short course held in Fresno California from November 8 through 10th. Many of the 125 attendees were either interested in growing pistachios in Kern County or were currently growing pistachios in Kern County. University of California Farm Advisors from Kern County were involved in organizing the conference and field tour, presented six of the educational seminars, and were instrumental in writing chapters for and in the editing of the short course manual. This manual will provide the basis for the eventual publication of a pistachio production manual, both written and as a CD that will be available through the University of California's publications office. This short course is held once every 5 years, and is an opportunity unmatched in the world to receive such a broad review of current practices and new developments in pistachio culture.

PISTACHIO CULTIVAR EVALUATION PROJECT

Two new female and one new male pistachio cultivars (varieties) were officially released by the University of California this past year to growers and nurseries interested in its propagation. These releases of new cultivars were the first such releases of new pistachio cultivars in over thirty years. The female cultivars are named 'Golden Hills' and 'Lost Hills' and the male cultivar, 'Randy'. All of these varieties were bred and evaluated in Kern County, and appear to be well-adapted here.

Extension of Information: Information on the characteristics of these new varieties, and how they differ from the industry standard female cultivar 'Kerman', has been extended through results presented at the pistachio commodity group (California Pistachio Commission) meetings in February 2005, at the 2005 Pistachio Short Course, in my pistachio newsletter, and in private meetings with interested growers in person, via e-mail and on the phone.

Results/Impacts: The oldest experimental plots of 'Golden Hills' and 'Lost Hills' are now in their 9th leaf (8-years old) and have been evaluated for yield, bloom and harvest dates, and other nut characteristics for 4 years. To date, both 'Golden Hills' and 'Lost Hills' have similar total yields, and yields of edible-split-inshell nuts to 'Kerman'. 'Lost Hills' has larger nuts than 'Kerman', but has weaker shell hinge strength. Nut size and nut quality characteristics of 'Golden Hills' are similar to 'Kerman'. Both 'Golden Hills' and 'Lost Hills' mature earlier than 'Kerman' by about 30 and 20 days, respectively. Currently, demand for hulling facilities and harvesters is critical when 'Kerman' matures, because over 95% of the industry is composed of this cultivar. These two new cultivars, would not compete with the 'Kerman' harvest and processing, and would provide opportunities to use existing harvesting machines and hulling facilities more efficiently. Both 'Golden Hills' and 'Lost Hills' appear to require less chilling hours than 'Kerman', and

produced well even during the warm winter of 2002-03, when the ‘Kerman’ pistachio crop failed over much of the San Joaquin Valley.

The ‘Randy’ male is earlier flowering than the ‘Peters’ male, which is the industry standard pollinizer for ‘Kerman’. Having both the new ‘Randy’ male, and the existing ‘Peters’ male in a new planting of either ‘Golden Hills’ or ‘Lost Hills’ will ensure good pollination of these new varieties, which flower about 10 days earlier in the season than ‘Kerman’.

Interest in the new varieties remains high among growers, and the limited initial release of available budwood, was much less than the demand. Only time will tell how valuable these new cultivars will be to the industry, but the initial promise they have shown suggests that small plantings in diverse areas of the San Joaquin Valley by growers willing to accept the risk that always is attached to new cultivars, would be appropriate.



The new pistachio cultivar ‘Golden Hills’ is shown in western Kern County, August 2005. University of California Pistachio Farm Advisors, stationed in Kern County from 1988 to the present, were instrumental in breeding, evaluating and releasing this cultivar to the pistachio industry.

Cotton, Corn and Small Grains

Brian Marsh, Farm Advisor

General Program Description

As Farm Advisor, responsibilities include the development and implementation of educational programs and applied research projects to address short and long term goals to meet clientele needs in cotton, corn and small grains. As Shafter Research and Extension Center Director, responsibilities consist of managing Center resources to support the Division's research and educational objectives.



Projects/Applied Research

UC COTTON SCOUT

In-season cotton plant mapping is important when making decisions about growth regulator and pest control applications. It can be a very time consuming process. Two methods currently in use are manually filling out cards and averaging the data or using an HP Palmtop PC to enter data. The current Palmtop is no longer compatible with new PC technology and spreadsheet software. In addition, the output calculations which were developed for Acala cotton varieties were not appropriate for Pima Cotton. To overcome this problem, we developed a cotton plant mapping software for a PDA that is compatible with today's computer technology and utilizes existing algorithms for data interpretation. The other innovation is that the program is graphically based utilizing touch screen technology. Rather than input various numbers, as present programs call for, a cotton plant diagram is displayed and the user points with the stylus to each boll position where a boll is present and the uppermost white flower. This program improves the speed and reliability for plant mapping data and is a great aid in making agronomic input decisions for cotton.



Results/Impacts: Effective implementation of Integrated Pest Management (IPM) requires accurate information to make pesticide and/or growth regulator decisions. UC Cotton Scout is a useful tool in this regard. The program was distributed to 15 users for testing this last year. The test was very successful and the program will be widely distributed this spring. Variety trials in cotton and wheat have identified varieties that are more resistant to diseases. A change in planted acreage of varieties has resulted from this information. UCCE variety trials and fungicide tests have provided the necessary data to make these informed decisions. Information is distributed to clientele through newsletters, field days, production meetings and on the web.

LOW-PRESSURE DRIP IRRIGATION

Years of research have documented the soil and water conservation advantages of subsurface drip irrigation. Low-pressure drip system (LPS) technology has shown a high potential for economically improving application efficiency of irrigation systems under sandy soil conditions in areas where water is scarce and/or expensive or where deep percolation to groundwater could be damaging. The low pressure system is installed just below the soil surface, it operates at very low flow and pressure, and it can stay on for longer periods of time without generating runoff or deep percolation.



Results/Impacts: Properly designed and managed drip irrigation systems have been shown to increase application efficiency of irrigation systems and could help alleviate the decreasing water availability for irrigated agriculture in the cotton belt. The LPS technology has many potential technical, energy and economic advantages over standard drip and subsurface drip irrigation.

Deciduous Tree Fruits and Nuts

Mario Viveros, Farm Advisor



General Program Description

The Deciduous Tree Fruits and Nut program consists of both research and education. The research focus on validation of research information was developed by faculty at UC Davis and by researchers at Kearney Ag Center. Experiments are also established to solve local production problems.

Educational Activities

Two almond growers' meetings were organized in 2004-2005. In the November meeting, growers were informed of new pesticide regulations, food quality and new pests. The May meeting was held in an almond orchard where the following was demonstrated: 1) New orchard spray technology, 2) new almond varieties, 3) new insect pests in almonds, and 4) weeds resistant to herbicides. In cooperation with John Karlik, Environmental Horticulture Advisor, we held two fruit tree pruning demonstrations in December for urban clientele. In our weekly Spanish radio program, in addition to agricultural issues, we informed our listeners about the dangers of heat and pesticide exposure.

Applied Research

THE ALMOND PEST MANAGEMENT ALLIANCE

This project studies the use of less toxic pesticides in almond production. This is its final year. The objective is to manage key almond pests (Navel orangeworm, Twig borer, San Jose scale and mite) using low risk pesticides to humans and environment.

Extension of Information: This information has been the basis for educating our growers and pest control advisors on alternatives to the use of organophosphate and carbamate pesticides in almond production. It is also available in a previously published leaflet, "Seasonal Guide to Environmentally Responsible Pest Management Practices in Almonds."



Results/Impacts: Monitoring of pests is the key to reduced unnecessary pesticide sprays in an almond orchard, and growers have learned the value of monitoring pests. Predatory mite releases for control of the web-spinning mite can work in well-irrigated orchards, and some growers have already implemented these changes. Organophosphate and carbamate pesticides may not be necessary in almonds culture, however their elimination can reduce yields. There are growers that have eliminated the organophosphate and carbamate pesticides from their almond pest management program.

THE REGIONAL ALMOND VARIETY PLOT

Kern County is number one in almond production in the state. It produces 206 million pounds, which represents 18% of the state production. To keep this production level, new orchards need to be planted every year. This has created the need for information on yield performance of new almond varieties. To provide the best research-based information on new varieties, a 22-acre plot was established in 1993 with Paramount Farming Company.



Extension of Information: The information from this experiment is published in the annual progress report “Regional Almond Variety Plot.” This report is distributed at our annual Southern San Joaquin Valley meeting. It is also distributed to growers at the Annual Almond Industry Conference in Modesto, California.

Results/Impacts: This experiment has segregated the most productive varieties such as Nonpareil, Fritz, Carmel, Monterey, Butte and Padre. Growers are using this information to establish new orchards. Twenty years ago, a good almond orchard produced 2,000 meat pounds per acre. Now, a good orchard is producing 3,000-4,000 meat pounds per acre.

ALMOND PRUNING

It is a tradition to prune almonds every year. Growers have come to believe that pruning increases yields in an almond orchard. There is no research, however, that supports this belief. On the other hand, pruning creates brush that must be burned or ground into chips. An experiment was established in 1998. The purpose was to determine yield response to pruning and to quantify the amount of brush produced by different pruning systems. The treatments were the following: 1) No pruning, 2) prune every other year, and 3) prune every year. These treatments were split into: a) Hedged and topped every year, b) hedged and topped every other year, and c) never hedged.

Extension of Information: This information will be made public in upcoming pruning demonstrations.

Results/Impacts: Pruning does not increase yields. The “no pruning” treatment has been producing the most crop. Pruning every year produces the lowest yields, but produces the most pruning brush. This brush increases pruning cost and can create an air pollution problem if it is burned.



ALMOND ROOTSTOCK EXPERIMENT

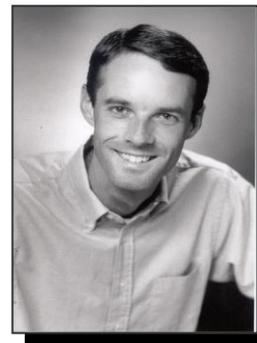
There are two distinct parts in an almond tree. The above-the-ground portion is called the scion and the portion below the ground is called rootstock. One of the primary functions of the rootstock is to anchor the tree. In some parts of Kern County the Santa Ana winds can gust up to 80 mph. This force can uproot not only trees but entire orchards. To test wind resistance, an almond rootstock was established in a windy area of Kern County. The following rootstock were included in the experiment: 1) Nemaguard, 2) Peach/Almond hybrid, 3) Hanson 536, 4) Nickels, 5) Viking, and 6) Atlas.

Extension of Information: This information has been presented to growers in Kern County and regional meetings. Also, an annual report is prepared every year for the Almond Board of California.

Results/Impacts: The most susceptible rootstock to wind is Nemaguard. In the fourth growing season, 54% of the Nemaguard trees were blown over by the wind. The most resistant rootstock was a peach/almond hybrid (Hanson 536). Growers have used this information to avoid wind damage in their orchards.

Entomology and Pest Management

David Haviland, Farm Advisor



General Program Description

The entomology farm advisor in Kern County is responsible for all aspects of arthropod pest management in both agricultural and urban landscapes. Primary objectives of the program are to develop and disseminate information on effective, safe, and affordable strategies to control insect and mite pests. This includes research and educational programs on topics such as biological control (fighting bugs with bugs), cultural control (modifying how crops are grown to minimize pest problems), treatment thresholds (how to decide if controls are needed), and chemical control (insecticide use). Particular attention is given when doing work on chemical control to make sure that the least toxic, yet effective and affordable, control strategies are used such that people and the environment are maintained safely. These programs are provided freely as a service to both farmers and the general public.

Applied Research

SPIDER MITES

The year 2005 was one of the worst years in recent history for damage from spider mites. Almond, peach, plum, nectarine, and grape orchards and vineyards throughout the county were bombarded by high numbers of spider mites sufficient to cause entire fields to become completely defoliated. This occurred at the same time as several new miticides became available for use in those crops. Farmers, however, had no previous experience with these products and had little information on how to incorporate them into their overall integrated pest management programs.



Spider mite-induced webbing on almonds

During 2005 I conducted three miticide trials that evaluated the effects of each of the new miticides compared to those of products with which farmers were already experienced.

Extension of Information: Data from these experiments have been provided to farmers at several educational meetings sponsored by the UCCE office as well as outside organizations. This information is also currently being prepared for dissemination through newsletters, trade journal articles, and other publications so that it can be of benefit to farmers dealing with spider mite problems statewide.

Results/Impacts: Farmers will be able to best incorporate these new control options into their existing pest management plans in a way that will allow them to effectively control the pests, and to do so in a manner that is cost-effective and has minimal impact on beneficial insects and mites that growers want to preserve.

GILLI MEALYBUG

Pistachio growers statewide are concerned about a new exotic pest, Gilli mealybug, which is spreading quickly throughout the state. This pest thrives on pistachio trees where it prefers to feed in the cluster, thus reducing both the size and quality of pistachio nuts. Kern County growers have been concerned due to how fast this pest is spreading and because infestations have been found in Ducor (southern Tulare County) just a few miles north of the Kern County line.

In response to this new threat I put together an extensive research and education program on this pest. I received funding from both the California Pistachio Commission and Almond Board of California to do research that would lead to our understanding of the pest and how to control it. Based on this research I have been able to determine information such as pest life cycle, how many generations per year it has, how it is distributed in a tree, what effect it has on nut quality, as well as how to control it through monitoring programs coupled with biological and chemical control.



Adult female *Ferrisia gilli*

Extension of Information: Results of this research have been presented directly to pistachio growers through a series of field meetings, industry conferences, media articles, trade journal articles, and numerous personal consultations.

Results/Impacts: One year ago the entire industry was frightened by this new pest that we knew nearly nothing about. Now, these nerves are being calmed as we have been able to provide information on how to control this pest effectively, and in an affordable way that is easily adoptable by pistachio growers.



During the early summer mealybugs feed on the rachis



Pistachios from mealybug-infested trees (right) compared to those from one that is not infested

PESTICIDE SAFETY OUTREACH

During the past few years Kern County growers have been at the forefront of the issue of pesticide drift and worker safety from pesticides. This program has been in direct response to several widely publicized drift incidents that have occurred in Kern County. Due to the severity of this issue I was able to secure a grant from the US EPA to do educational training programs to teach farmers how to prevent incidents that result in exposure of people to pesticides. These programs include private applicator trainings that target growers directly and are being done cooperatively with the Kern County Agricultural Commissioner's office. They also include programs to train-the-trainer, in this case farm labor contractors and other interested parties who are responsible to train agricultural fieldworkers in response to the federal worker protection standard (WPS) aimed at protecting all fieldworkers.

Extension of Information: As a result of this project, in 2005 we were able to train and get certified approximately 90 farm labor contractors and other interested individuals as official trainers of agricultural fieldworkers. This training included not only information on what needs to be taught to fieldworkers, but also training on how to be an effective teacher.

Results/Impacts: It is anticipated that each of these trainers will now be responsible for training dozens to hundreds of fieldworkers over the next several years. This will educate fieldworkers on how to avoid exposure as well as what to do if they suspect that they are being exposed. These results, coupled with the private applicator trainings that teach growers how to ensure that drift and other exposure incidents never occur in the first place, will hopefully result in a reduced amount or prevention of future incidents in Kern County.

ADDITIONAL ACTIVITIES

In addition to the three highlighted activities previously listed, I am currently involved in a total of 12 externally funded research projects for which I am serving as the Principal Investigator as well as 5 others where I am serving as a cooperator. By the end of 2005 I will have given 36 presentations, published over 25 newsletters and trade journal articles, conducted approximately 20 interviews leading to the dissemination of my research and other information through media outlets, and provided information on a one-on-one basis to over 200 individuals from the general public. All of these activities have been done for the direct benefit of Kern County farmers and residents with relation to safe and effective methods for managing insect pests.

Environmental Horticulture/Environmental Science

John Karlik, Advisor

General Program Description

Environmental horticulture refers to establishment and care of plants for the landscape, such as shade trees and turfgrass, as well as production of those plants in an agricultural setting. Classes, seminars, and written material are avenues used to provide information regarding plant selection, pest management, and cultural practices such as pruning. The major research focus of the environmental science component in recent years has been directed toward air quality, with a specific focus on the relationship of plants to secondary air pollutant formation in the lower atmosphere.



Kern County Outreach

THE "GREEN SCENE" NEWSLETTER

A need exists for dissemination of information for professional landscape managers, both of recent research results and of fundamental principles and their application. The *Green Scene* newsletter continues as a conduit of information, with about 300 names on the mailing list.

MASTER GARDENER CLASSES

Interest in horticulture continues in Kern County, from both homeowners and those involved in commercial enterprise. In fall, 2005, a 16-week Master Gardener I class with an enrollment of 82 was held. We discussed how to grow plants, including plant selection, tree planting, pruning practices, irrigation, non-chemical pest management, and gardening myths. In the context of the class, we also offered a horticultural tour to England and France to see landscapes that have stood the test of time, as well as to observe how land-use planning has preserved green spaces.

Results/Impacts: Participants were provided with up-to-date horticultural information for home or commercial gardens.



PRUNING DEMONSTRATIONS FOR FRUIT TREES

Collaborator: Mario Viveros, UCCE Kern County

In response to the many requests for information on establishment and pruning of deciduous fruit and nut trees, pruning demonstrations were offered two days in December, at the demonstration orchard at the UCCE office. We also made available UC fruit tree publications.

Results/Impacts: Attendees learned improved pruning practices for fruit trees.

RESEARCH PERTAINING TO AIR QUALITY

Because air quality is such a large concern in the San Joaquin Valley, a UC workgroup has been established. Frank Mittloehner of UC Davis and I are co-chairs of the group. In addition, Dr. Mittlowhner and I continue to work on VOC (volatile organic compounds) emissions from dairy cows.

Additional data and research results regarding biogenic emissions were compiled, and one manuscript was prepared and submitted, based on studies conducted by our group in the Central Valley. This research was originally conducted to help the California Research Board improve biogenic emission inventories.

Results/Impacts: I continue to develop data and serve as an information resource for the Air Resources Board as attainment strategies are pursued.

LOST HILLS ALMONDS STUDY

Collaborators: Blake Sanden and Mario Viveros, UCCE Kern County

The Lost Hills Almond study investigates the uptake of certain heavy metals into almond leaves and nuts. We have almost finished data analysis for this project, and a UC Davis researcher is also participating in interpreting results.

Results/Impacts: More than 400 waste dumps exist in California, and once closed the areas are fenced and the land left without use. Our work may suggest that for certain kinds of landfills some kinds of agricultural crops could be planted and harvested.



ROSE INDUSTRY

The Fourth International Rose Symposium was held in Santa Barbara in September. This is the first time this meeting, which is held every five years, has been held in the U.S. More than a hundred scientific papers were presented. Attendees came from the U.S., Canada, England, Germany, Italy, Israel, India, Japan, China, Thailand, Ecuador, Brazil, and other nations. The Wasco area rose growers participated in planning the symposium, and sponsored a midweek tour to see production fields. Research developments were presented by attendees, as well as an update on laws and regulations.

Results/Impacts: Kern County rose growers had an opportunity to expand their contacts with scientists and rose producers from other parts of the world.



4-H Youth Development Program

John Borba, Advisor

General Program Description

4-H is a youth educational program administered by the University of California Cooperative Extension. The program is designed for youth who are in Kindergarten through 19 years of age. Kern County hosts more than 40 traditional clubs that accommodate 1200 members and 400 volunteer adult leaders. In addition to the club program, special outreach programs are offered to both urban and rural youth through special projects and school enrichment programs.



Projects

OPERATION: MILITARY KIDS/OPERATION PURPLE CAMP

When National Guard, Reserve, and other military parents living in a civilian community are mobilized, their children immediately become “military kids”. Many of the support systems these youth had may no longer be adequate. They suffer silently and worry about their parent. State and County Cooperative Extension staff, in cooperation with community agencies, youth organizations, and schools, are reaching out to these military youth through the Operation: Military Kids program. In Kern County we have made contacts with different agencies to provide support and information networking for military families. In June of 2005, Kern County 4-H helped secure a grant and facilitated the planning and implementation of Operation Purple Camp at Camp Condor. The camp was open to the dependent military youth of families who had a parent deployed on active duty.



Campers learn the fine points of archery.



Campers learn how to fold the colors.

Results/Impacts: Ninety seven children from throughout the state attended the week-long camp. The youth had the opportunity to experience activities and projects that taught them about everything from nature to computer skills. A major part of the camp was providing these youth the chance to communicate with each other about what it is like to have a parent out of the home and possibility in harm’s way. A licensed therapist was available and visited each cabin to speak with the youth about coping. The camp facility could only accommodate 100 children; there was a waiting list of more than 200 to go to this camp.



Campers enjoy a trail ride.



Performing a skit at campfire activities.

4/H/ROPP

The Kern County 4-H program and the Kern County Probation Department continued the partnership they formed back in 2003 to enrich the lives of troubled youth. The 4-H/Repeat Offender Prevention Program (ROPP) provides 4-H experiences to youth 10 – 15 years of age who do not have the family support system to involve them in a traditional club. ROPP includes young people who are already in the legal system and need structure and positive reinforcement to enhance their development. Each week for a twelve week cycle, probation officers transport their youthful wards to activities and project meetings hosted by 4-H youth, volunteers, and staff. The projects include hands-on instruction in a variety of skills ranging from food preparation to industrial arts. The projects chosen are selected from the 4-H enrollment form.

Results/Impacts: This is the second full year of this joint project. The youth involved receive a positive educational experience while forming bonds with their adult caseworkers. This collaboration between the Kern County Probation Department and 4-H has been recognized in the past for its efforts by receiving two grants. Officers note an improvement in the attitudes of the youth involved in ROPP.



Putting new-found wood working skills to use in constructing a tool box.



Youth participants learn how to prepare a recipe.

YOUTH ASSET DEVELOPMENT CASE STUDY

This research project is designed to study and describe the steps a community in California has taken to create a positive approach to youth development. Previous approaches taken by communities have been based on the “at-risk” method, which focuses on reducing negative or problem behaviors. Asset development approaches take the concept that youth need positive influences in their lives to thrive and become good citizens. Some communities have formed collaborative organizations to bring this idea to fruition. My role in this project has been to interview community collaborative members in Pasadena and Sacramento. We are currently compiling the data and have presented the preliminary results to one of the collaborative groups. Further research will continue in the coming months.

Irrigation and Agronomy

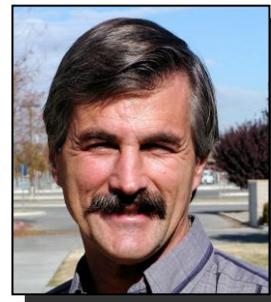
Blake Sanden, Farm Advisor

General Program Description

IRRIGATION & SOILS: This portion of my program focuses on two major areas:

- 1) Irrigation system management – optimizing efficiency and profitable water use.
- 2) Salinity/fertility management – crop salt tolerance, soil quality and nutrient availability.

AGRONOMY: Research and advising on all phases of production of alfalfa and forage crops, dry beans, sugar beets and safflower.



Educational & Professional Outreach

During 2005 I have presented the results of Kern County research projects and general soil/water management talks, at 16 county level field days or seminars, 14 statewide meetings, 1 international meeting, and in 25 publications consisting of newsletters, workshop handouts, project reports, book chapters, and popular press and scientific journal articles. Many of my research projects and consultation over the last 13 years on soil amendments (gypsum, greenwaste compost, and sewage sludge), sprinkler irrigation uniformity, water use efficiency/irrigation scheduling in almonds and other crops, and salt tolerance in pistachios continue to provide relevant information to the Kern agricultural industry and state/local agencies for production farming and resource management issues.

Outreach on agronomic crops usually focuses on farm calls and telephone consultation on crop water use, fertility and soil quality, but also includes organizing and/or speaking at field days and annual meetings for alfalfa, cotton, dry beans, sugar beets, almonds, and pistachios. Through these meetings and personal phone and farm call consultations I am providing direct service to about 1,500 people a year.

Applied Research

FIELD IRRIGATION MONITORING, PRODUCTION IRRIGATION SCHEDULING AND CALFED WATER USE EFFICIENCY

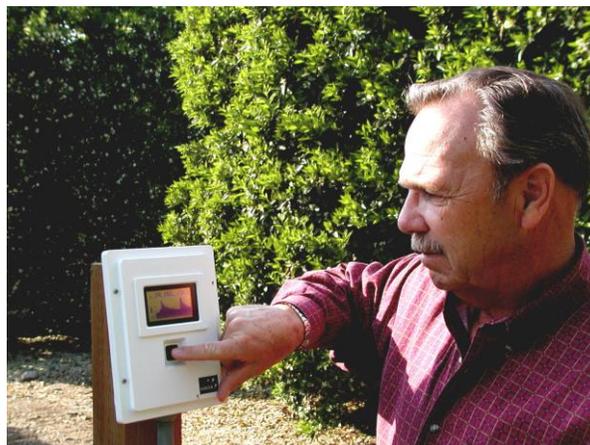
California water planners and the environmental community plan on meeting increased urban water demand by efficiency improvements in agricultural irrigation. A 75% to 80% irrigation efficiency has been considered good to excellent in the past, but Kern water districts and growers have said for more than 20 years that they are operating at higher efficiency due to increasing water costs and continued low commodity prices. New innovations in micro electronics now provide cost-effective opportunities for growers to monitor soil moisture to document and, in some cases, improve the efficiency of irrigation to increase crop yield.

Starting Winter 2001, Kern UCCE worked together with the area Resource Conservation District Irrigation Mobile lab to instrument grower's fields with neutron probe access tubes, tensiometers, electrical resistance blocks (Watermarks[®]) and a continuously recording data logger with a visual display that does not require downloading to a computer. Growers were faxed one page weekly irrigation scheduling recommendations also containing a seasonal summary of CIMIS ET estimates, soil moisture and applied water history. Additional grower fields (from 8 to 18) have been instrumented every year since 2003 with a low-cost logger/sensor combination for a total of 138 fields covering 11,491 acres belonging to 27 different growers in 14 different crops, 11 soil textures and 9 different irrigation system types.

Overall grower response has been positive, with most stating that the program has made their irrigation more efficient – improving crop yield and quality. Many of these fields, primarily low volume systems using expensive water on the Westside, were near optimal or deficit irrigated before entering the program. In some cases, soil moisture deficits recorded with this demonstration effort called for increasing applied water.

Extension of information: In 2005, 3 new growers and an additional 12 fields were added to the program. The results of this project were presented through meetings with growers, irrigation districts, professional societies and at a Spring Irrigation Workshop.

Results/Impacts: This project continues to demonstrate that careful monitoring of irrigation can reduce the amount of water used in some fields and increase the yield in others. Improved yield and quality has been seen in irrigated cotton, table and wine grapes, almonds, sugar beets and pistachios. **The estimated average water use efficiency (WUE) was very high, averaging 95%.** This study shows much of Kern County irrigation is already at maximum efficiency.



ESTABLISHING PISTACHIOS AND INTERPLANTED COTTON WITH SALINE WATER

Westside water supplies can easily exceed \$100/ac-ft and supply is limited. Many areas have marginally saline groundwater, or drain water that is suitable for cotton with properly managed irrigation systems such a drip tape. A nine-year study in NW Kern County indicates that mature pistachios are as salt tolerant as cotton and are suited to using these lower quality waters.



Two 155 acre fields in the Belridge Water district were set up with drip tape to irrigate Pima cotton in 2004, comparing large 20-acre replicated plots of fresh aqueduct water to pumped well water that is 10 times as salty. Cotton yields were excellent for all treatments (3.7 bale/ac). Pistachios were planted March 2005 with a reduced, 4-row cotton planting in between tree rows. Tree growth is excellent.

Extension of Information: Results of this trial have been presented to 250 people in two statewide meetings, many farm calls and office consultations, two popular press articles and one newsletter.

Results/Impacts: Well water cost to the grower is about \$50/ac-ft less than the normal price of district water; saving the grower about \$130 per acre per year. In water short years, this savings will exceed \$250 per acre per year, and may make the difference of the grower continuing to farm the acreage. The success of these salt tolerant pistachio trials has prompted pistachio developments on more than 3,000 acres of marginally saline cotton ground in Kern County in the last two years.

Livestock/Range and Natural Resources

Ralph Phillips, Farm Advisor

General Program Description

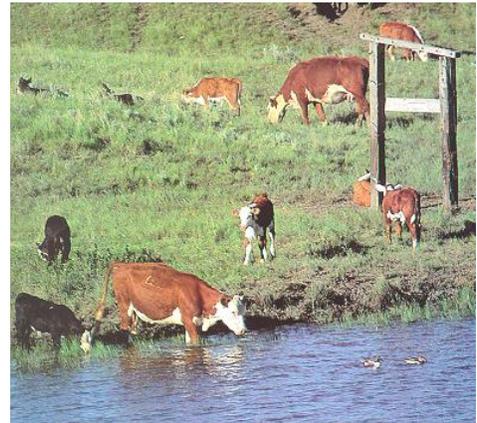
The Range, Natural Resources/Livestock position covers Kern and Tulare Counties with the majority of time spent in Kern County. The research efforts in the program cover six or more blue oak projects with most of the effort directed toward seedling survival. Other research involves five studies covering waterborne pathogens. The education portion of the program is covered through newsletters, phone calls and producer meetings. A public service part of the program is geared to inform the general public about natural resources, livestock and the value of cooperative extension.



Applied Research

BEEF CATTLE PUBLICATION

Several years ago I began developing a University of California publication that addresses the needs of people beginning a beef cattle enterprise. Many people are coming into the beef industry with little or no background in beef production. This publication will give these clients the background to get started and will be available before July 2006.



Cattle grazing in pasture.

WATERBORNE PATHOGENS

Water quality is a major issue brought to light by the clean water act. The amount of waterborne pathogens in streams is one concern, especially in relation to animal agriculture. The public perception is that animal agriculture is the major source of water borne pathogens in surface water. Several studies were undertaken looking at both livestock and wildlife in relation to the waterborne pathogen *Cryptosporidium* spp. The data indicates that wildlife are a much bigger source of environmental loading of *Cryptosporidium* than livestock. For example, it takes 6-8 cows to equal one California ground squirrel, one Belding ground squirrel or one coyote. It takes about 17 cows to equal one skunk and 95 cows to equal one Yellow-bellied marmot. In a study just completed in Yosemite Park comparing pack stock (horses and mules) to Belding ground squirrels, it takes about 3,000 horses to equal one Belding ground squirrel.



Coyote

Results/Impacts: The information from the Yosemite study is being used by the City of San Francisco to make decisions regarding waterborne pathogens in the water supply for the city. This science-based information should provide water quality regulators and policy-makers information to make sound decisions.

Extension of Information: The information from the waterborne pathogen studies have been presented to the back-country horsemen group, national recreational horse users, the Society for Range Management, and local livestock producers groups. The data has been published in four professional publications.



Yellow-Bellied Marmot



*Belding Ground
Squirrel*

OAK SEEDLING SURVIVAL

An oak research program was started in Kern County in 1989 for two main reasons: Oaks are a very important natural resource in California and very little scientific information is available regarding the regeneration and survival of blue oak seedlings.

Results/Impacts: After 16 years, the study of blue oak seedlings has indicated that a group of naturally occurring plant pathogens may be the major cause of blue oak seedlings death. Currently, studies are underway to identify the plant pathogen that is causing seedling death.

Extension of Information: The blue oak seedling survival data will be published in two articles in the California Agriculture publication and another paper will be published in the Society for Range Management. The information has been presented to local landowners.

FOOD SAFETY

The cattle industry is very interested in providing a quality and wholesome beef product to the consumers. The industry and the University of California Cooperative Extension have developed an educational program to help producers produce a quality product. Several years ago, 150 beef producers attended these educational programs. This past year Bakersfield College Agriculture, California Cattlemen Association and Cooperative Extension presented a food safety program to over 90 people.

Nutrition, Family and Consumer Science

Margaret Johns, Advisor

General Program Description

The Nutrition/EFNEP, Family Development, and Consumer Science Program in Kern County are a vital community resource for agencies and individuals. The major goal of the NFCS program in Kern County is to stay abreast of major societal issues and modify programs in ways that assist families achieve better health and self-sufficiency. The majority of the programs focus on extender training, allowing me to maximize my efficiency and ultimately reach many more consumers with University of California programs. Extenders include community professionals, agency staff and volunteers, who provide county residents with valuable information in the areas of nutrition, family development and consumer economics. These research-based extender-training programs allow agencies to improve their knowledge and provide better service to their clientele.



Projects

NUTRITION EDUCATION PROGRAM **TEACHING HIGH RISK YOUTH NUTRITION AND COOKING SKILLS**

In 2004 – 2005 a new project teaching nutrition and cooking skills to high-risk teens was started in Kern County. The project is funded at .10 FTE (full time equivalents) and graduated 35 youth its first year.

This project was initiated because many high risk teens lack the life skills necessary to achieve self-sufficiency as they mature into adults. It is currently estimated that 1/3 of the nations homeless population consist of former foster youth. There are between 400 to 500 teens between the ages of 13 to 18 in foster care in Kern County. This Food Stamp Nutrition Education Project, teaching nutrition and cooking skills, targets high-risk, low-income teens in foster care, juvenile hall, and community and continuation schools.

Current research indicates that people who cook at home eat less fat and calories, and more calcium. A high fat, high calorie diet is a major contributor to obesity, heart disease and cancer. A diet low in calcium is a serious risk factor for osteoporosis (weak bones). An added benefit to cooking at home is that it is less expensive, which also helps one manage their resources.

The participants were given pre-and post test to measure knowledge gained and confidence in skills gained.

Extension Methods: The courses consist of 6 hours of education conducted over a 6 week time period. It is taught by the Youth Nutrition Coordinator for UCCE.

Results/Impact: Preliminary data indicates students gained both knowledge and confidence in their skills.



EVALUATION OF THE “GATEWAY TO A BETTER LIFE” LIFE SKILLS EDUCATION PROGRAM

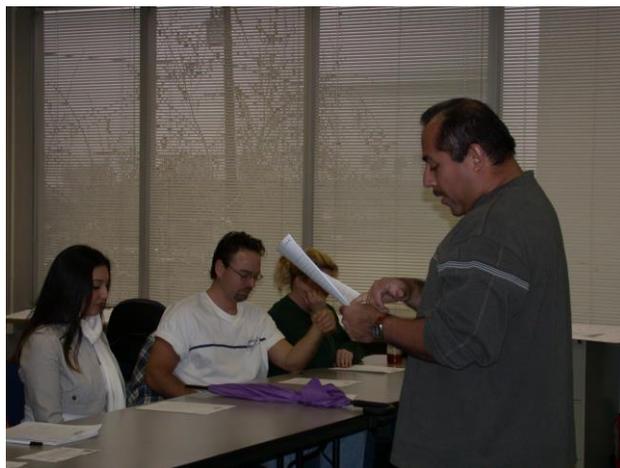
The *Gateway to a Better Life*, life skills education program was developed in California by a team of Nutrition, Family and Consumer Science advisors, 4-H advisors and a University specialist. This program was originally developed to address the welfare reform, welfare-to-work movement. The curriculum consists of 9 units and 24 lessons designed to assist one in finding a job, but more importantly in keeping a job.

I collaborated with the Mexican American Opportunity Foundation’s Job Training program to evaluate the curriculum. This program has a 10 week, 15 hour mandatory soft skills education program for all of the students in their job training programs. I trained their trainers to teach 15 hours of Gateway. All of the units were covered except the four lessons in the Nutrition Unit.

Evaluation tools were developed to test knowledge gained and behavior change. A final Gateway Evaluation tool was used, which utilized a retrospective post then pre-examination of how much knowledge they feel they gained from the classes.

Extension Methods: The Mexican American Opportunity Foundation’s job training program teachers were trained to teach the *Gateway to a Better Life* curriculum. Classes were taught for 1 to 1-1/2 hours over 10 weeks. Evaluation instruments were administered by the MAOF teachers. The study contained a sample size of 89.

Results/Impact: Although preliminary data shows the students did not gain knowledge according to the unit pre-post test, the Gateway Evaluation instrument indicates the students felt their knowledge increased by 20%. The behavior based pre-post test instruments showed students had an increase of 12% for new behaviors.



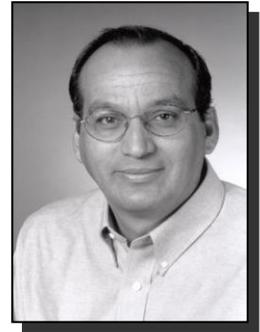
Vegetable Crops/Plant Pathology

Joe Nunez, Farm Advisor

General Program Description

There are approximately 32 different vegetables planted for commercial production on over 91,000 acres of Kern County farmland with a total value of over \$330 million. Vegetable production can be found in diverse areas of the county.

As the vegetable advisor, it is my responsibility to meet the needs of the vegetable industry by establishing an applied research program to solve local vegetable production problems and by extending new research-based information with an ongoing education outreach program. In addition, I help answer questions and solve problems that the general public may have in areas that I have some expertise.



Applied Research

CARROTS

Effectiveness of metam sodium is of concern after reports from Holland, Australia, and Israel show that repeated applications of metam sodium on the same field leads to enhanced biodegradation of metam sodium.

When soil microbes are exposed to chemicals in the soil some of the microbes will feed on the chemical and break it down into simpler forms. This process is called biodegradation, generally a good thing because it means chemicals applied to the soil will be broken to safe forms after they control a pest. However, when these microbes are repeatedly exposed to the same chemical over and over, their populations build up in the soil to such high levels that anytime that the chemical is applied it is quickly consumed by the microbes. In this case the chemicals are not around long enough for the chemical to serve its intended purpose. Enhanced biodegradation is not helpful to the farmer if the pesticide is degraded too quickly. Kern County is a likely place for enhanced biodegradation of metam sodium to occur because of its frequent use in potato and carrot production.



Jed DuBose and Mike Mauro evaluating carrots for nematode damage from a carrot nematode trial

A soil survey was conducted in three areas of Kern County with significant carrot and potato production. Four field types from each area were sampled. Those field types included 1) fields with no history of metam sodium use, 2) organic fields, 3) fields with a long history of metam sodium use, and 4) fields where metam sodium did not provide adequate control of soil-borne pests. Soil samples were sent to the USDA Soil Salinity Laboratory at UC Riverside for analysis on rate of degradation.

Results/Impacts: The results showed no differences in the rate of breakdown of metam sodium among the four soil histories. That would conclude that enhanced biodegradation of metam sodium was not a factor in Kern County. This information was just released and there are no measurable impacts as of yet.

Extension of Information: The information has been released in a news release and will be presented at the annual carrot symposium. It has also gone out in a newsletter to the local growers and consultants.

TOMATOES

Processing tomatoes are a growing commodity in Kern County with acreage increasing yearly. New processing tomato varieties are released each year by seed companies. Staying on top of which tomato varieties work best in Kern County changes each year with the release of new seed varieties. For Kern County tomato growers to be competitive they must effectively use all the tools available to them including tomato varieties.

A uniform statewide tomato variety trial is conducted in all the major tomato growing regions of the state. A uniform statewide trial will identify which varieties perform best in each tomato growing county. The study consists of a replicated trial and an observational trial. In all, over 30 new varieties are looked at along with 2-3 standard varieties. Each individual plot is 100 ft in length and is harvested and weighed to obtain tons per acre yield. Each year we have been able identify which new tomato varieties work best in Kern County along with which varieties should not be planted here.

Results/Impacts: The processing plants decide which varieties to plant with input from the growers. They have used my reports and the one from CTRI (California Tomato Research Institute) to determine which varieties to use in Kern County.

Extension of Information: The results are immediately sent to the processing plant in Kern County and the cooperating grower. The results are sent a little later to the rest of the growers in Kern County by newsletter. CTRI publishes all the data from all the counties and sends it out to all tomato growers and processing plants in the state.

POTATOES

Although Kern County is famous for its potatoes, it is actually losing acreage each year; however, it is still a very important commodity for many growers. Growers here are always interested in new varieties that will work well in Kern County's climate. Although the University does not have a potato breeding program, it has always maintained a variety evaluation program.

Varieties produced by other universities, USDA, or private breeders from throughout the US are collected and planted in replicated trials in a grower's field as the Kern County Potato Evaluation Trial. Which varieties to try is decided by a grower advisory panel that I have formed. The trial is harvested, graded, and evaluated to determine which varieties work best in Kern County.



Results/Impacts: From these initial small plots, growers decide which varieties to try on a larger scale in their own fields. Many varieties that have gone through the Kern County Potato Evaluation Trial have been tried by growers on a larger scale and been adopted by them.

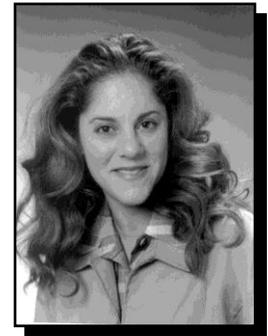
Extension of Information: A field day is conducted at Hart Memorial Park soon after the harvest of the Potato Evaluation Trial. Here growers are able to see how the tubers appear cosmetically and what the potential yields are. The results are also sent to growers and consultants in a newsletter and again as a report to the California Potato Research Advisory Board, which every grower receives.

Viticulture

Jennifer Hashim-Buckey, Farm Advisor

General Program Description

The Viticulture Farm Advisor provides a broad based, off-campus education and research program in the fields of viticulture (with an emphasis on table and wine grapes), small fruits production, post-harvest handling and pest/pathogen management for agricultural associations, governmental agencies and homeowners in Kern County. Major duties include providing information to grape growers on the latest and most efficient means of production viticulture through a variety of methods such as newsletters, media, consultations and commodity meetings.



Applied Research

MONITORING AND CONTROL MEASURES FOR PIERCE'S DISEASE IN KERN COUNTY

Pierce's disease (PD), caused by the bacterium *Xylella fastidiosa*, is a killer of grapevines. Significant vine loss from PD has occurred in Southern California, North Coast and portions of the southern San Joaquin Valley including Tulare and Fresno counties over the last 100 years. However, the arrival and spread of the glassy-winged sharpshooter (GWSS), a more effective vector of the disease, caused devastating losses in the wine-growing regions of Temecula and threatened Kern County, a major grape production area of the state with more than 87,000 bearing acres and a farm gate value of approximately \$438 million dollars.



Young vines infected by the Glassy-winged sharpshooter in a Kern County vineyard show PD symptoms and eventually succumb to the disease.

A large-scale, joint research project was initiated in 2002 between the Cooperative Extension and the California Department of Food and Agriculture (CDFA) to map the incidence and track the spread of Pierce's disease (PD) within 215 vineyard blocks in Kern County. The area was selected for evaluation because of its importance as a major grape production area and its short history of GWSS infestation. The acreage surveyed within the project represents over 4,000 acres of grapes, or roughly 5% of the total bearing grape acreage in the county with 15 cultivars of varying ages being examined.

Results/Impacts: This project has provided multiple positive impacts to grape growers, public agencies working to reduce the populations of GWSS and limit the spread of PD. First, the benefits to growers included one-on-one education about the disease and a three-year personalized data set revealing the PD status of individual vineyards and the locations of affected vines for more than 30 growers that cooperated in the project. This data set was used to encourage growers to pull out diseased vines in order to eliminate sources of the bacteria for spread by the GWSS. Since the inception of the project, we have observed an 83% reduction of PD from 2002 to 2003, and a subsequent decrease of 60% from 2003 to 2004 in the vineyards located in the General Beale Pilot Project, an area where the GWSS was first discovered and significant vine losses had occurred due to PD (see photo above). The data set also provided an essential layer of information to the USDA Area Wide Management of GWSS Project on the history and location of PD in Kern County. This information was used to designate treatment zones in which it was absolutely critical to keep GWSS populations down to slow the spread of PD.

Extension of Information: The information generated from this project was modified for presentations at the annual CDFA Pierce's Disease Symposium and at several field meetings to demonstrate that effective PD control can be obtained with a combination of an area-wide GWSS treatment program and monitoring for and removal of diseased vines.

EFFECTS OF PREHARVEST FUNGICIDES ON THE POSTHARVEST DECAY OF TABLE GRAPES CAUSED BY BOTRYTIS CINEREA AND REDGLOBE MELTING DECAY DISORDER

Significant economic losses are often caused by post-harvest diseases that appear after long term cold storage and shipment of grapes. *Botrytis cinerea*, the most important of the post-harvest diseases, severely affects stored table grapes because it can infect the berries in the field and then continue to develop on the fruit during storage at 0°C (32°F). *Botrytis* symptoms are characterized by “slipskin” lesions and the development of grey-white mycelium (fuzz) on the berries. Eventually the berries will leak their juicy contents all over adjacent fruit causing additional infection and rot. Treatment of this disease generally occurs both in the field and following harvest by promptly cooling the fruit and fumigating it with sulfur dioxide gas prior to storage.



Plain-packed Redglobe table grapes treated with a pre-harvest fungicide after 10 weeks in cold storage.

Melting Decay Disorder, or Soft Tissue Breakdown, as reported by the South Africans, is a new post-harvest disease first reported in California in the late 1990's on the cultivar Redglobe. The symptoms of this disease include fine cracks that develop on the surface of the berry followed by sunken lesions and subsequent breakdown of the whole berry. This disease is thought to be caused by the bacterium *Bacillus subtilis* and/or two yeasts, *Cryptococcus laurentii* and *Aurobasidium pullulans*. There are currently no treatment recommendations for this disorder.

Three replicated trials to assess the performance of three different fungicides were initiated in the Delano area during the Fall of 2005. The table grape varieties Redglobe, Autumn Royal and Crimson Seedless have been treated, harvested and will be evaluated for the diseases listed above after 4, 6, 8, 10 and 12 weeks following fumigation and cold storage.

Results/Impacts: This project is currently in progress and no results have been generated to date. If this trial is successful, it may establish preliminary treatment recommendations for Melting Decay Disorder and additional treatment recommendations for *Botrytis*. Furthermore, it will provide a new tool to growers to improve quality and reduce losses due to post-harvest decay of stored fruit.

Extension of Information: The results of this trial will be published in various newsletters and will eventually be presented at the Visalia Table Grape Seminar.

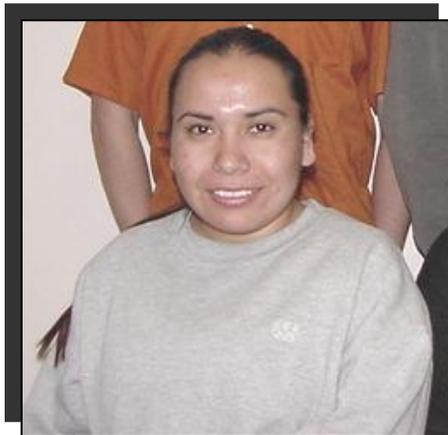
Support Team



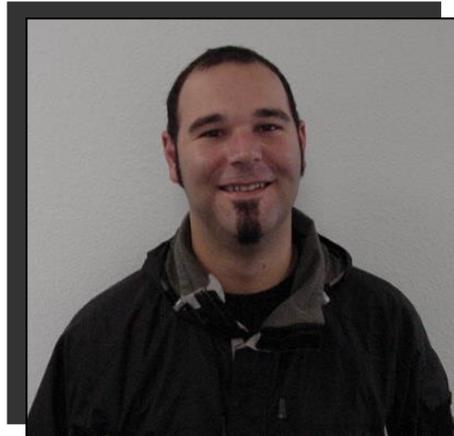
Peggy Schrader
Staff Research Associate I



Murray Pryor
Staff Research Associate I



Minerva Gonzalez
Laboratory Helper



Mike Mauro
Laboratory Assistant II



Jed DuBose
Laboratory Assistant III

Support Team



Jan Gillespie
Nutrition Program Manager -EFNEP



Karen Bayne
Youth Coordinator-EFNEP

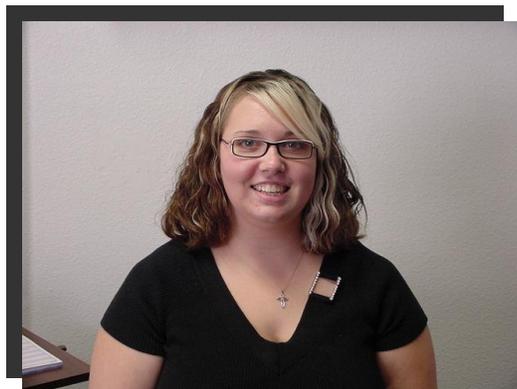


Bea Ramirez
Community Health Program Rep, Assistant - EFNEP

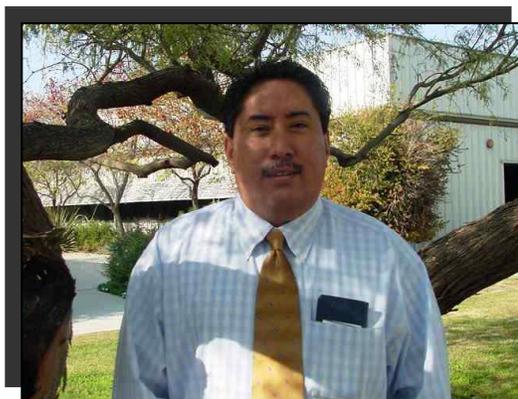


Doreen Guerrero
Community Health Program Rep, Assistant - EFNEP

Support Team



Veronica Slaton
4-H Program Representative II



Berney DeLaCruz
4-H Program Representative II



Denise Long
Office Services Coordinator



Rick Ramirez
Ag Field and Equipment Specialist



CLERICAL

Left to right: Sharon Crane, Kimberlee Claffy,
Norma Wilson, Marilyn Henderson

DARLENE LIESCH, COUNTY DIRECTOR

Phone: 661-868-6212 • E-mail: dgliesch@ucdavis.edu

UCCE ADVISOR STAFF

John Borba

4-H Youth Development Advisor
661-868-6216
jaborba@ucdavis.edu

Jennifer Hashim-Buckey

Viticulture – Grapes & Kiwis
661-868-6223
jmhashim@ucdavis.edu

David Haviland

Entomology & Pest Management
661-868-6215
dhaviland@ucdavis.edu

Margaret Johns

Nutrition, Family & Consumer
Science
661-868-6217
mcjohns@ucdavis.edu

Craig Kallsen

Citrus/Pistachios/Subtropical Crops
661-868-6221
cekallsen@ucdavis.edu

John Karlik

Env. Horticulture and Env. Science
661-868-6220
jfkarak@ucdavis.edu

Brian Marsh

Cotton, Corn & Small Grains
661-868-6210
bhmarsh@ucdavis.edu

Joe Nunez

Vegetable Crops/Plant Pathology
661-868-6222
jnunez@ucdavis.edu

Ralph Phillips

Livestock/Range/Natural
Resources
661-868-6219
rlphillips@ucdavis.edu

Blake Sanden

Irrigation Mgmt./Agronomy/Alfalfa
661-868-6218
blsanden@ucdavis.edu

Mario Viveros

Deciduous Tree Fruits & Nuts
661-868-6211
maviveros@ucdavis.edu

UCCE NON-ACADEMIC STAFF

Karen Bayne

Youth Coordinator-EFNEP
661-868-6213
klbayne@ucdavis.edu

Jed DuBose

Lab Assistant III
661-868-6236
jfdubose@ucdavis.edu

Jan Gillespie

Nutrition Program Manager-EFNEP
661-868-6214
jjgillespie@ucdavis.edu

Minerva Gonzalez

Laboratory Helper
661-868-6236
cekern@ucdavis.edu

Doreen Guerrero

Nutritional Education Assistant
661-868-6234
cekern@ucdavis.edu

Mike Mauro

Lab Assistant II
661-868-6240
cekern@ucdavis.edu

Veronica Slaton

4-H Program Representative II
661-868-6235
vaslaton@ucdavis.edu

Berney DeLaCruz

4-H Program Representative II
661-868-6227
bdelacruz@ucdavis.edu

Murray Pryor

Staff Research Associate I
661-868-6240
mppryor@ucdavis.edu

Bea Ramirez

Nutritional Educational Assistant
661-868-6234
cekern@ucdavis.edu

Peggy Schrader

Staff Research Associate I
661-868-6236
plschrader@ucdavis.edu

KERN COUNTY STAFF

Denise M. Long

Office Services Coordinator
661-868-6225
longd@co.kern.ca.us

Kimberlee Claffy

Office Services Technician
661-868-6233
kgclaffy@ucdavis.edu

Sharon Crane

Office Services Technician
661-868-6230
cekern@ucdavis.edu

Marilyn Henderson

Office Services Technician
661-868-6229
mjhenderson@ucdavis.edu

Rick Ramirez

Ag Field & Equipment Specialist
661-868-6237
cekern@ucdavis.edu

Norma Wilson

Fiscal Support Technician
661-868-6232
wilson@ucdavis.edu

**UC COOPERATIVE EXTENSION
KERN COUNTY FARM AND HOME ADVISORS**
December 2005

Appointed: University of California
COUNTY DIRECTOR
Darlene Liesch

UC Personnel Academic	(12)
UC Personnel Non-Academic	(12)
Kern County Personnel	(6)

