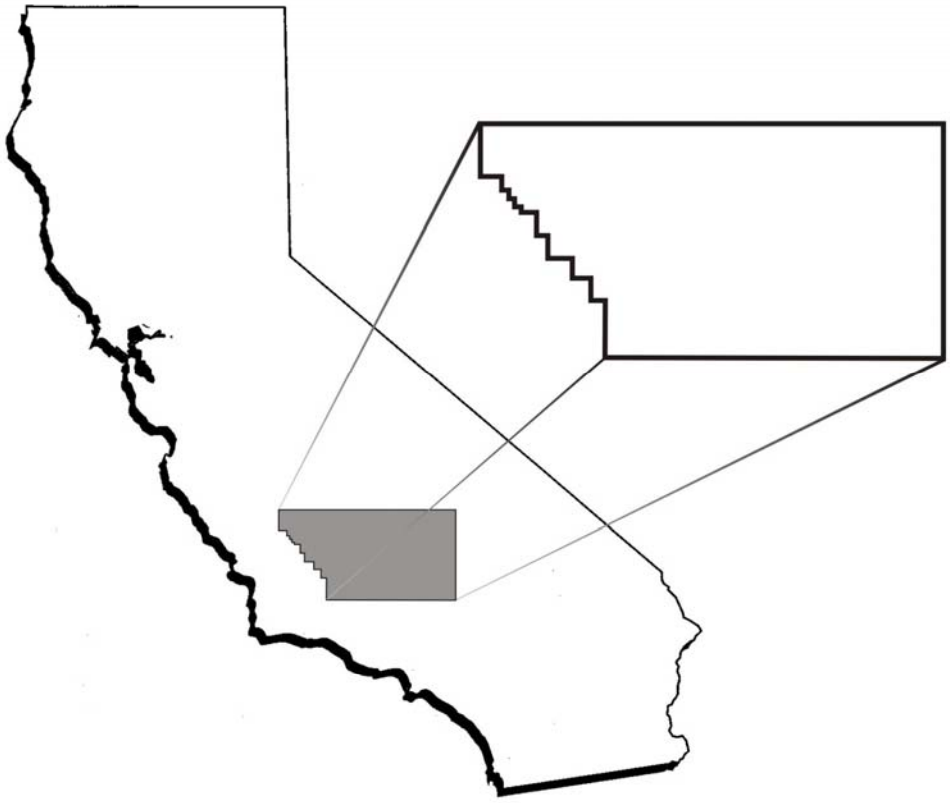
University of California Cooperative Extension
Kern County Farm and Home Advisors
2006 Annual Report



University of California
Agriculture & Natural Resources

Cooperative Extension Kern County

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Kern County Farm and Home Advisors

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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, USDA, 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

Planning goals for the year is an important task. I have always said (along with many others) that you need to know where you are going if you intend to get there. Each year advisors for the University of California Cooperative Extension in Kern County take the time to write project goals. At the end of the year, they report the progress of the projects and their intent to continue them if the project is long-term. Inevitably, there are one or two advisors who are handed a surprise challenge during the year which gives them the opportunity to address an issue that is not part of their planning. And that is the wonderful thing about Cooperative Extension. We are local. Our advisors address local needs when they develop. In many instances the results of their projects end up serving not only Kern County citizens but others as well. I will give two examples:

Pistachio growers came to our Entomology Advisor David Haviland with a problem. A newly identified mealybug was spreading throughout pistachio production regions. This pest sucks on plant juices and robs the tree of carbohydrates which are intended for fruit development. David joined with other advisors, UC specialists, and cooperators from other agencies – in this case CDFA – to solve the problem through research. Results of the research, which led to very effective management programs, were published in a new publication, *Ferrisia gilli: A new Mealybug Pest of Pistachios and Other Deciduous Crops*, which is now available to clientele. Our Kern County Advisor had a major role in writing this publication. In addition, he was responsible for all of the photographs.

Lately we have been hearing the word “pandemic” in the news. Local health experts along with experts from the World Health Organization are concerned that the Avian Flu could be the world’s next pandemic. Our Nutrition, Family and Consumer Science Advisor, Margaret Johns, realized the need for public information to prepare for such an event. She developed a newsletter for families that explains what a pandemic is and how to prepare for such an emergency. The newsletter was placed on our County website. In addition, it has been translated into Spanish. Margaret has planned a “training for trainers” program which will be held in January for businesses and agencies that can in turn do in-service training for their staff. This is another example of UCCE Advisors seeing a need in the community and addressing it.

In both these instances, the additional result of addressing concerns of citizens in Kern County is producing information that can also be shared with other counties throughout California.

Planning is essential. It takes us where we want to go; however, what is also essential for UCCE is the ability of our advisors to depart from the intended direction by identifying local needs, and using their expertise and the resources of the University of California to address those needs. We have been doing that for over 90 years.

Darlene Liesch
County Director

Citrus, Pistachios and Subtropical Crops

Craig Kallsen, Farm Advisor

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.

Projects/Applied Research:

EXTENSION AND IMPACTS OF THE PISTACHIO CULTIVAR EVALUATION PROJECT

Additional budwood from the two new University of California female cultivars and one male pistachio cultivar was provided to nurseries in July, 2006. These new varieties, named 'Golden Hills', 'Lost Hills' and 'Randy', respectively, were bred and evaluated in Kern County and officially released in 2005. Limited plantings of Golden Hills, Lost Hills and Randy continue to be made as growers are informed of the continuing positive yield and nut quality characteristics of these cultivars at UC Cooperative Extension meetings and in California Pistachio Commission reports and as more budwood becomes available from commercial nurseries. A major distinguishing characteristic of the two new female varieties and their pollinating male is earlier nut maturity. The late maturation this season of the industry-standard pistachio variety, 'Kerman' underscored the need for earlier-maturing pistachio varieties.

A second round of pistachio tree selections, planted at several locations in 2002, flowered and produced nuts for the first time this season. Initial yield and nut-quality evaluations suggest that some of these selections may have characteristics that could be of value to the pistachio industry.

Close up of Golden Hills in flower near Twisselman Road in early March, 2006

POSSIBLE FUTURE IMPACTS OF DEFICIT IRRIGATION ON FRUIT YIELD AND QUALITY PARAMETERS OF NAVEL ORANGE

Kern County is known for its production of early-maturing oranges. To ensure a minimum level of quality, oranges may not be picked until the rind has reached a legally-defined level of orange color, and the juice a minimum concentration of sugar and acid. First-year results from an experiment conducted in a cooperating grower's Beck navel orange orchard suggests that fruit sugar and acid concentration can be increased by deficit irrigating Beck navel orange trees. By carefully applying less water to orange trees, it may be possible to increase the sugar content of navel oranges without affecting fruit color, hopefully resulting in a better-tasting early-harvested orange.

Harvesting the experimental orange plot along Maricopa Highway in late October, 2006

Impacts of the General Citrus and Pistachio Extension Program:

An integral part of my job continues to include extending information to citrus and pistachio growers in Kern County that originated from new or old research conducted at UC/Riverside, UC/Davis, United States Department of Agriculture and from other major research institutions worldwide. In the past years I sponsored or cosponsored five major grower meetings where scientists were invited to present results that could improve profitability of local farms. In the past year, the citrus and pistachio extension effort has involved over 40 farm visits in response to production questions or problems in the field, as well as numerous consultations by telephone. This one-on-one interaction with growers has informed me about problems of importance to growers that I can carry to ag research scientists at the universities or experiment stations. In several cases research scientists have visited our local farms and shared their expertise directly with growers. In most cases, talking directly to growers has improved the grower's knowledge base assisting them in making more informed decisions related to their question or problem. Examples of field problems addressed this year include: heat stress on citrus, pistachio fertility, pruning both citrus and pistachio, persimmon rind problems, California red scale control, rootstock selection in citrus, maintaining orange rind juvenility, irrigation of pistachio and citrus, alternate bearing in pistachio, late-onset graft incompatibility in citrus, citrus stubborn disease, and others.

Cotton, Corn and Small Grains

Brian Marsh, Farm Advisor

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. Commodity areas include cotton, corn and small grains. As Shafter Research and Extension Center Director, responsibilities include managing Center resources to support the Division's research and educational objectives.

Projects/Applied Research:

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. Energy costs are reduced as less than 10 psi is needed for the system. 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.

LPS Drip Tape Installation

Results/Impacts:

This study is designed to assess LPS under a reduced tillage system without the use of any other irrigation method for stand establishment. This combines the benefits of increased water use efficiency and lower energy costs for improved irrigation efficiency and fewer tillage operations resulting in lower production costs and airborne dust. Since the drip tape was installed two years ago, only three cultivation passes have been made. No major tillage operations, the kind that generate lots of dust, have been performed. LPS water usage was 6 acre-inches less than furrow irrigation and yields of cotton (05) and blackeye beans (06) have been comparable with yields from furrow irrigation. This system does present some challenges in stand establishment on very sandy soils and with weed control, which continue to be investigated. Weeds can be controlled in cotton using glyphosate and other herbicides. Fewer chemical weed control options are available for blackeye beans. The LPS technology has many potential technical, energy and economic advantages over standard drip and subsurface drip irrigation.

LPS Drip Under Reduced Tillage
Blackeye Beans

TRAINING VIDEOS

Research for production agriculture has generated information that can also benefit gardeners and homeowners. This is especially true for pruning fruit trees and ornamental bushes. Experts in these areas show the proper pruning techniques for citrus trees and various types of rose bushes. The use of electronic media greatly increases the number of people that can access vital information.

Craig Kallsen, UCCE Kern County Citrus Advisor, demonstrates the proper method of pruning a typical backyard citrus tree. His presentation discusses the proper tools and techniques for maintaining an appropriate sized tree, optimal fruit production and reducing pest problems. The key to proper pruning is to understand how a citrus tree grows and produces fruit. The video takes you inside the tree canopy to see "downward cuts" that shape the tree and optimize productive foliage.

Proper pruning enhances the presentation of rose bushes and their productivity. John Karlik, UCCE Kern County Horticulture Advisor, talks about what to look for as he demonstrates pruning and shaping techniques for Grandiflora and Hybrid Tea roses. He discusses size and shape for various landscapes and reviews what to look for in overall plant health and insect control.

The videos are available in VHS or DVD format from the Kern County Extension Office.

Deciduous Tree Fruits and Nuts

Mario Viveros, Farm Advisor

Program Description:

The Deciduous Tree Fruit and Nut program serves almond, peach-nectarine, plum, apple, cherry and walnut growers. The program consists of educational activities and research applied experiments.

Educational Activities:

Fruit and nut growers were kept up-to-date on new advances in horticulture science. There were seminars, orchard demonstrations, newsletters, news releases and Spanish radio programs.

Research Activities:

Mario demonstrating yield potential of new varieties at the Almond Variety Field meeting

VARIETY IMPROVEMENT

Two almond variety experiments were established in 1993 and 2003 respectively. The purpose was to determine horticultural characteristics of almond varieties developed by the University of California breeding program and nurseries introductions. These experiments are being carried out with the assistance and cooperation of Thomas M. Gradziel, Bruce D. Lampinen and Warren C. Micke from UC Davis. The information from the experiments has been disseminated in grower's meetings and field demonstrations. The results have been also published in the "Regional Almond Variety Progress Report" which has been distributed at our annual Southern San Joaquin Valley meetings.

The main impact of these experiments has been a yield increase in Kern County orchards due to the planting of high yielding varieties such as Fritz, Monterey, Butte and Padre.

ALMOND PRUNING

In 1998 a long term pruning experiment was established in a 40 acre orchard. The purpose was to determine the impact of pruning on yields and brush removal. The disposal of pruning brush has become a big problem in the San Joaquin Valley. It can't be burned or incorporated in the orchard.

Almond growers were invited to attend field demonstrations where the results of the experiment were presented.

The results of this experiment can be summarized as follow: yields are inversely proportional to pruning. This is to say, an increase in pruning results in a decrease in yields, and an increase in pruning brush.

ALMOND ROOTSTOCK EXPERIMENT

Kern County can be affected by the Santa Ana wind in autumn and early spring. When this wind blows through almond orchards, it can cause trees to blow over. Two experiments were established in the Tejon area to determine rootstock resistance to the Santa Ana winds.

The information of this experiment has been presented to growers in regional almond meetings and in reports to the Almond Board of California. The results showed that Nemaguard is the most susceptible rootstock to wind damage. In 1999, 54% of trees on Nemaguard were blown over by the wind but only seven percent of the Hanson-536 was affected. In 2006, it was determined that Hanson-536 was 100% susceptible to "Crown Gall." This is a disease that can lead to rotting of the hardwood which can lead to a weak tree subject to be blown over.

ALMOND TREE TRAINING FOR CATCH FRAME HARVESTER

This experiment was established in 2003 to determine if trees can be trained with deferential tree head heights. The overall objective was to train trees with a high head and canopy suitable for a catch frame harvester. These harvesters can eliminate 80% of the dust created by conventional harvesters.

The results of these experiments have been presented in field demonstrations and Almond Board of California research conferences.

At the present time, there is only horticultural data from this experiment. There is no harvest data from a catch frame harvester. For this reason, this experiment has not caused an impact in the almond industry.

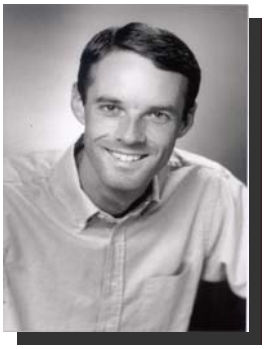
The beginning of a new almond crop in Kern County

Setting up weighing equipment in an almond orchard

Entomology and Pest Management

David Haviland, Farm Advisor

Program Description:



The Kern County Entomology Advisor is responsible for the development and dissemination of information on pest management to residents of Kern County. This includes information on insect management to both commercial farmers as well as to the general public, and is made freely available to any interested party.

Major research projects focus on the development of integrated pest management (IPM) strategies that are safe (for both humans and the environment), effective, and economically practical. They take a very holistic approach to pest management by simultaneously evaluating cultural, biological, and chemical control strategies.

This year, worker safety and awareness trainings were held in Kern County in conjunction with the Agricultural Commissioner's Department and through a Federal E.P.A. grant. In addition, general consultations were provided over the phone, e-mail, or front office to help homeowners identify and manage insect pests in and around the home. Free on-line information on more than 100 different pests is available through the IPM web site, http://ipm.ucdavis.edu, administered by the University of California Integrated Pest Management Program.

Applied Research - 2006 Highlights:

MANAGEMENT OF VINE MEALYBUG IN GRAPE NURSERIES WITH A HOT-WATER TREATMENT PROGRAM FOR DORMANT PROPAGATION MATERIALS

This program has been accepted by CDFA and, as of 2006, has been adopted 100% by nurseries in Kern County and by nurseries statewide that provide over 80% of the grape planting materials statewide. Since the inception of this program three years ago, movement of vine mealybug via nursery materials has become negligible.

MITICIDE STUDIES IN ALMONDS, PEACHES AND PLUMS

Research trials in stone and nut crops from 2004 through 2006 were conducted to evaluate the use of new, reduced-risk insecticides compared to more toxic industry standards. Data have helped growers determine which of the many new available miticides are most effective and have been used to teach resistance management. They have also lead to alternatives to and decreased reliance on propargite (Omite), which is on the top of the EPA's list of pesticides to remove from agricultural use due to its severe issues with worker safety.

BIOLOGY AND MANAGEMENT OF THE MEALYBUG (FERRISIA GILLI), IN PISTACHIOS AND ALMONDS

Information has been developed on pest biology and biological control that has led to a complete IPM program of value statewide. Nearly 100% of pistachio growers throughout the state that are affected by this pest have adopted this IPM program as an alternative to multiple applications of the highly toxic insecticides carbaryl and phosmet. These programs, and associated extension efforts, have drastically slowed the orchard-to-orchard and county-to-county spread of this new exotic pest.

LEAFFOOTED BUG MANAGEMENT IN ALMONDS

Leaffooted bug is an established pest of almonds that reached epidemic levels in 2006, and resulted in over 60,000 acres of additional pesticide treatments to almond orchards in Kern County. Research on this pest during this year has led to a better understanding of its biology, and of the huge differences among almond varieties to damage from this pest. This will be of great assistance to almond growers in 2007 who determine the need to treat for this sporadic pest.

Early-season leaffooted bug damage causes nuts to abort; later in the season it causes kernel damage that renders the nuts inedible.

Woolly whitefly on the underside of a grapefruit leaves from north Bakersfield

MONITORING THE ESTABLISHMENT OF WOOLLY WHITEFLY IN KERN

The introduction and spread of a new citrus pest, woolly whitefly, was monitored through urban areas of Kern County. The efforts led to widespread media coverage that taught homeowners the value of high-pressure water as a viable control alternative to the widespread use of ineffective broad-spectrum insecticides.

Environmental Horticulture/Environmental Science

John Karlik, Advisor

Kern County Outreach:
MASTER GARDENER CLASSES

The climate and relative affordability of housing in Kern County allow individuals to practice horticulture at home, to improve the environment, improve aesthetic qualities of their neighborhood, and produce food at home. A large commercial landscape industry also exists. In fall, 2006, two 16-week Master Gardener classes were held, a Master Gardener I class with an enrollment of 61 and a Master Gardener II class with an enrollment of 39. Kern County is the only county in California in which a series of Master Gardener classes is offered. We discussed plant selection, tree planting, pruning practices, irrigation, non-chemical pest management, and gardening myths. We had a weekend trip to Huntington Gardens for interested participants from the Master Gardener II class, during which we saw plant selections and arrangements and saw the beginnings of the new Chinese Garden. In the context of the class, we also offered a horticultural tour to Italy to see landscapes that have stood the test of time, as well as to observe how landscapes were arranged over several centuries.

Japanese Garden at Huntington Gardens

Impact:

Presentation of up-to-date horticultural information for Kern County.

PRUNING DEMONSTRATIONS FOR FRUIT TREES

Collaborator: Mario Viveros, UCCE Kern County

Mario Viveros and I offered two pruning demonstrations in December. The climate of Kern County allows a greater range of home fruit trees species to be grown than in many locations. To maintain yield and prolong tree life, pruning is necessary for deciduous fruit trees. However, it is difficult to teach or to learn pruning in a classroom setting or from photographs or books. Therefore, we offer these free demonstrations on an annual basis for all interested Kern County residents. We also make available fruit tree publications we wrote, which were printed through the county reprographics service.

IMPACT:

Improved pruning practices for fruit trees.

LOST HILLS ALMOND STUDY

Collaborators: Blake Sanden and Mario Viveros, UCCE Kern County

The Lost Hills almond study has been completed this year, and a draft final report has been submitted to the Kern County Waste Management Department. This study investigated whether or not, and how much, specific heavy metals and non-metallic elements were taken into almond leaves, shells, hulls, and nuts. More than 8200 determinations of chemical content of leaves, shells, hulls, and kernels of almond trees were made, and 118 spreadsheets were constructed to assess statistical significance for elements for which concentrations were found to be above the limits of detection. We also commented on the toxicological implications of our findings, as well as the irrigation management at the study site and its possible relationship to the mobility of metals and non-metals in the orchard. The overall conclusion was that uptake of elements of potential toxicological significance did not occur in almond kernels or hulls at concentrations associated with elevated risk, and in most cases were not detected at all.

Impact:

The orchard at the study site is producing almonds safe to eat. Considering the more than 400 waste dumps that exist in California, this study suggests that for certain kinds of landfills some kinds of agricultural crops could be planted and harvested. At the present time, these areas are closed, fenced, and the land left without further use.

Sampling almonds for Lost Hills study

Hull split in almonds at Lost Hills

4-H Youth Development Program

John Borba, Advisor

Program Description:

4-H is a nationally recognized youth development program which promotes citizenship, leadership, and life skills. In California, the program is administered by the University of California Cooperative Extension. 4-H is open to youth five through nineteen years of age. Kern County hosts more than 40 traditional clubs which accommodate 1200 members and 400 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.

Highlights:

TEENS MAKING DECISIONS

Motor vehicle accidents are the leading cause of death among teenagers. Teens in the Central Valley of California are at an even higher risk of motor vehicle-related injuries. Teen fatalities from car crashes are three times higher in the Central Valley than in any other part of the State according to the National Highway Traffic Safety Administration. Of the twenty-five traffic fatalities in Bakersfield in 2003, eleven were teens. This project is designed to learn more about the early experiences young people have with driving and their perceptions about driving habits. From the information gained, the project members will create program resources for parents and communities to help guide their youth toward safe driving habits.

Results/Impacts:

High school seniors from several Central Valley high schools were interviewed in focus groups to develop questions regarding driving habits for a teen survey. In Bakersfield, twenty boys and twenty girls from Ridgeview High School participated in two separate focus group interviews. After the surveys were developed, eighty-seven seniors from Ridgeview took part in the survey and provided their input. The data received from these surveys is being compared to those from other parts of the State. Plans are underway to distribute the survey to the senior class of Arvin High School. Local results and the statewide comparison will be available early next year.

YOUTH ASSET DEVELOPMENT CASE STUDY

Youth everywhere need positive assets within their community to help them develop and thrive. This research project is designed to provide youth the opportunity to survey the assets they have within their community and give voice to it through a photo journal type project. Several counties in California have administered the survey and provided their results to the project research team. The data received allows adults to view the perceptions that youth have regarding their community.

Results/Impacts:

In Kern County, we partnered with Friday Night Live to involve youth in the project titled "You, Your Community, Your View". Cameras and research notebooks were distributed to members of Friday Night Live at their schools. Those who participated then met in a focus group where they shared data and provided the research team with copies of their field research notebook. A report will be prepared when all the data from participating counties is analyzed.

Youth researchers compare their data

OPERATION MILITARY KIDS

Operation Military Kids is a national outreach program to the dependent youth of military personnel, particularly those in the National Guard and the Reserves. Kern County has a high rate of National Guard and Reserve forces who have been and who are preparing to mobilize. When National Guard and Reserve parents living in civilian communities are deployed their children suddenly become military dependents. Many of their normal support systems may no longer be adequate. State and County Cooperative Extension staff, in cooperation with community agencies, youth organizations, and schools, is reaching out to these military youth through the Operation Military Kids program.

Operation Military Kids participate in 4-H Field Day.

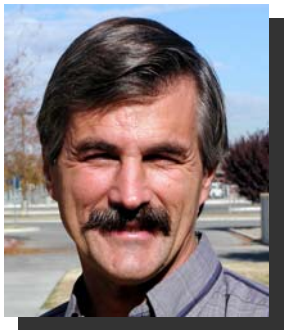
Results/Impacts:

This year the 4-H Program Representative made great strides in recruiting service organizations, military units and their families, and community agencies to partner together. The partnership provides for increased services and information to the National Guard and Reserve families in Kern County. Also, Edwards Air Force Base received support from the Extension Office in specialized training for their youth staff in expanding 4-H opportunities for the youth in their military community.

Irrigation and Agronomy

Blake Sanden, Farm Advisor

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, amendments 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

Methods:

Presentations at field meetings and workshops plus individual consultation through farm and phone calls.

Impacts:

- 12 Kern County meetings
- 5 other county meetings
- 5 professional society meetings
- 2 international consulting trips
- 1500 people served

IRRIGATION MANAGEMENT & MONITORING

Situation: Increased water costs, variable field characteristics and crop water consumption mean growers have to be more efficient. New technology for field water monitoring developed in the last eight years can be very helpful and confusing to growers.

Methods: Install/demonstrate a simple logger and soil moisture sensor combination paid for by growers. Document irrigation efficiency and "user friendliness" of technology.

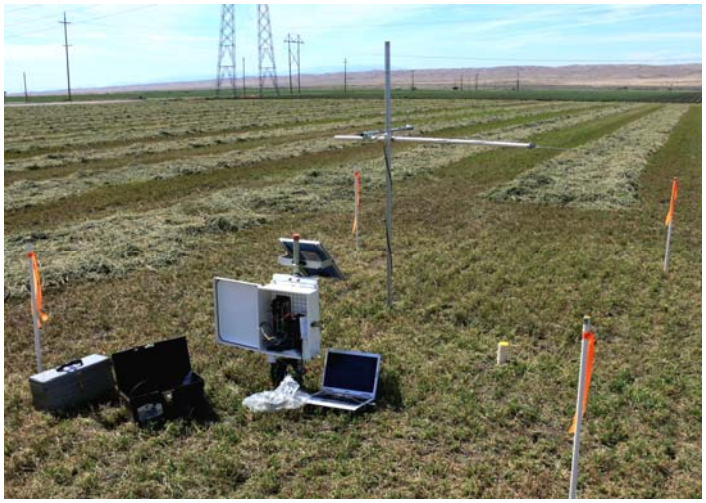
Impacts:

Monitoring, loggers/sensors installed:

- 11,781 acres over 136 fields
- 30 different growers
- 14 different crops
- 11 soil textures
- 9 different irrigation system types
- Average water use efficiency: 95%

WATER CONSERVATION & DEFICIT IRRIGATION

IN ALFALFA



Situation: Urban water demand in California is increasing. New dams and supply are not being developed. Increased demand is being met through water conservation. Alfalfa is the largest crop water use in the state, about 4 million ac-ft (MAF)/year. The highest water use is in July when supply is the highest and the feed quality lowest.

Methods: Impose July irrigation cutoff, measure decreased crop water use, yield loss and stand recovery (grower losses). Leverage losses against stabilized prices and sale of water to urban sector.

Impacts: About ½ ton/ac yield loss to grower, saving about six inches of water, over one million acres of alfalfa in the state provides enough water for 300,000 people (0.5 MAF) in a drought year while allowing the alfalfa to recover by the end of the season.

SALINITY, CROP TOLERANCE AND ORCHARD DEVELOPMENT

Situation: More than ½ million acres in the San Joaquin Valley have salinity problems – often associated with ground-water that contains excess salts. Low value field crops like safflower, grain and cotton have been the traditional crops. But to remain economically viable growers are planting trees and vines. Salinity tolerance thresholds and practical irrigation techniques for pistachios need to be established.

Methods: One nine-year small plot study in Kings County showed that pistachios were as salt tolerant as cotton. A ten-year trial planted March 2005 over a 300 acre production field irrigated with buried drip tape will establish the viability of developing pistachios using well water that is ten times the salinity of the California Aqueduct.

Impacts:

- Pistachios appear to be five times more salt tolerant than almonds.
- About 8,000 acres of pistachios currently planted to saline soils, much of it as a result of my consultation.
- An additional 20,000 acres likely to be planted in the next five years.

Nutrition, Family and Consumer Science

Margaret Johns, Advisor

PREPARING FOR A PANDEMIC

A pandemic is a global disease outbreak. A flu pandemic occurs when a new influenza virus emerges for which people have little or no immunity. The disease usually spreads easily from person-to-person, causing serious illness, and can sweep across countries and around the world in a very short time.

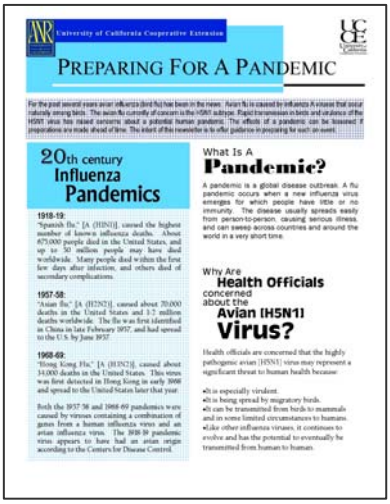
Pandemic disease outbreaks occur about every 30 years. Currently, there is concern that a new pandemic flu may emerge. Health officials are concerned that the highly pathogenic avian (H5N1) virus may represent a significant threat to human health. The last pandemic was the 1968-69 "Hong Kong Flu" pandemic. Currently the World Health Organization is concerned that the H5N1 Avian Flu could become the worlds next pandemic.

Health experts have been monitoring this new and extremely severe influenza virus-the H5N1 strain for almost eight years. Since mid-2003, this virus has caused the largest and most severe outbreaks in poultry on record. In December 2003, infections in people exposed to sick birds have been identified. It has the potential to mutate to "human to human" transmission but to-date the transmissions have been from infected birds to humans. Fortunately, the virus does not jump easily from birds to humans or spread readily and sustainably among humans.

The need for consumer information on how to prepare for a flu pandemic is great. There is very little information for consumers on the internet and the majority of disaster preparedness information addresses short term, localized disasters such as earthquakes.

Extension Methods:

To address the need for consumer information and education, I have developed an eight-page newsletter which explains what a pandemic is, current concerns regarding the avian (H5N1) virus, history of 20th century pandemics and detailed emergency preparedness instructions on how to prepare for a pandemic. In addition, I have developed a power point presentation. This presentation is to be used for in-service education for businesses, schools, agencies and training trainers.



University of California Cooperative Extension

PREPARING FOR A PANDEMIC

20th century Influenza Pandemics

1918-19:

1957-58:

1968-69:

What Is A Pandemic?

A pandemic is a global disease outbreak. A flu pandemic occurs when a new influenza virus emerges for which people have little or no immunity. The disease usually spreads easily from person-to-person, causing serious illness, and can sweep across countries and around the world in a very short time.

Why Are Health Officials concerned about the Avian (H5N1) Virus?

Results/Impacts:

The newsletter is posted on the county website, cekern.ucdavis.edu. It has recently been translated into Spanish, which will soon be posted to the county website. A copy of the newsletter has been sent to all of the County Department heads along with information regarding my availability to conduct in-service education and the training for trainers program to be conducted in January.

To date I have conducted three in-service education programs for businesses. I am presenting the PowerPoint, *Preparing for a Pandemic*, and distributing copies of the newsletter at the Kern County Network for Children's General Collaborative meeting. Finally, a request for funds has been made to the University to fund printing of the newsletter so it can be distributed through the county library system.

ELEMENTARY SCHOOL CAFETERIA PROJECT

School foodservice staffs are "gatekeepers" who are in a unique position to improve the dietary habits of children and, by extension, their families. They can become the voice and energy behind making improvements to school foods. The hypothesis is that as foodservice workers improve their nutritional knowledge, skills, and habits, they will become more skilled in educating children about healthy eating. In addition, they will be more invested in making health-promoting changes to school foods and food policy. Therefore, by offering an enhanced nutrition education program to school foodservice staff and providing them with resources that they can share with children and their families, the potential exists to greatly improve the nutrition and health practices of the children they serve.

Poster in school cafeteria encourages students to eat fruits

Extension Method:

I conducted interviews at six schools in Kern County and interviewed foodservice managers and principals. I also worked with a school site and collected 231 parent surveys. The purpose of the surveys was to determine what type of nutrition information parents wanted and how they wanted to receive it.

Results/Impact:

The stakeholder interviews demonstrated interest from foodservice managers and principals on utilizing creative methods of reaching parents and children in elementary schools with nutrition education information. The principals were very aware of the relationships between nutrition and learning. The foodservice directors were more reserved in their support of the project due to constraints of time, money and staffing; however, they were supportive of the need for nutrition education information for parents and children.


Train serving line at Stella Hills Elementary School

The survey indicated the parents were interested in receiving information in a variety of formats including school newsletters and information handed out at school events. They were interested in recipes with easy to prepare foods that kids like.

This was the first phase of the project. Funds for continuation of the project have been requested. The second phase of the project involves evaluating a variety of strategies for reaching parents and students with nutrition information.

Vegetable Crops/Plant Pathology

Joe Nunez, Farm Advisor

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.

As the vegetable advisor, it is my responsibility to identify, prioritize and meet the needs of the vegetable industry by establishing an applied research program to solve local vegetable production problems. I extend new research based information with an ongoing education outreach program through the use of meetings, newsletters, farm calls, and mass media. In addition, I help answer questions and solve problems for the general public in areas that I have some expertise.

CARROTS

Carrots are a major vegetable crop in Kern County with the world's top two carrot producers located here. Producing carrots that are disease free is important for yield and consumer satisfaction. One problem that is becoming an issue is cavity spot. Every carrot field must be treated with at least one fungicide application to prevent this devastating disease of carrots. Even then fields are lost each year due to cavity spot. A method to detect and quantify the organism that causes cavity spot would enable growers to determine which fields need fungicide treatments and which ones should not be planted to carrots at all due to high population counts of the organism in the soil.

A project to develop such a method is currently being carried out. By using genetic fingerprinting technology, it is hoped that we will be able to tell growers if they have the pathogen present in their soil, and if so, at what soil population level.

Jed DuBose evaluating carrots for cavity spot damage from a carrot cavity spot trial.

APPLIED RESEARCH:

A UC Specialist has developed a polymerase chain reaction (PCR) specific to cavity spot. Jointly we are testing the system to determine if we can correlate the amount of cavity spot in the field to the amount of cavity spot fungus measured by the PCR method. Locally we collect soil samples from carrot fields and send them to UC Davis for PCR analysis, and collect carrot samples from these same fields to evaluate them for incidence of cavity spot. We hope to have the evaluation of this new real time PCR technology completed by next spring.

Extension of Information:

Results will be presented locally to growers and consultants at the annual Carrot Research Symposium held in Kern County. The results will also be presented at the 32nd International Carrot Conference in France in 2007.

RESULTS/IMPACTS:

Our expectation is that growers will change the way they manage cavity spot once this technology is proven. The overall impact will be less use of fungicides and less yield loss due to cavity spot.

POTATOES

Potatoes are planted onto approximately 23,000 acres each year with a net worth of $78 million. A recently recognized problem is an early dying symptom. As fields reach maturity they often wilt and senesce prematurely, especially during the warm months. A bacterium has been identified as the causal agent of this abnormality. A rot begins on the seed piece and moves up the stem and causes the wilt late in the season. The bacterium also is responsible for post harvest losses.

APPLIED RESEARCH:

Numerous trials have been conducted which were designed to look at various treatments that could be applied to seed piece to protect them from infection from *Erwinia carotovora sub.sp. carotovora* (E.c.c.). Field surveys were conducted to ascertain that E.c.c. was the cause of the problem and that sound seed pieces were always associated with healthy plants. Efforts were also begun to identify the bacterium by genetic fingerprinting.

EXTENSION OF INFORMATION:

Results of these efforts are written into a final report. Updates of the research are given at the annual potato grower's meeting in summer and at the Kern County Vegetable meeting in late Fall. Updates are also presented through my newsletter and during various farm calls to Growers and Pest Control Advisors.

RESULTS/IMPACTS:

We have been able to show that E.c.c. is the cause of early dying of potatoes and that protecting the seed piece from decay will prevent the disease from occurring. We have also shown that there are other non-Erwinia species that may be co-pathogens with E.c.c. Recently we have shown that plant depth plays a significant role in seed piece health and we will try to manipulate that to the crops advantage. The polymerase chain reaction (PCR) technique has been perfected to the point that we can now detect bacteria in water, soil, and plant tissue.

Growers evaluate potato varieties from variety trial

Growers now know the causes and conditions of early dying. They are checking seed potatoes carefully to make sure that they are sound and damage free before planting. They now try not to over water, especially during periods of high temperatures.

Viticulture

Jennifer Hashim-Buckey, Farm Advisor

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.

Projects or Applied Research:

INFLUENCE OF FUNGICIDES APPLIED BEFORE HARVEST ON POSTHARVEST DECAY OF TABLEGRAPES

Botrytis cinerea Pers. ex Fr. (teleomorph Botryotinia fuckeliana (de Bary) Whetzel), the cause of gray mold, is the most important pathogen of stored table grapes. Botrytis cinerea, which also causes Botrytis bunch rot in the field, severely affects stored table grapes because it can infect the grapes in the field and then continue to grow in the berries during storage at 0°C (32°F). Growers attempt to manage the disease before harvest by integrating canopy (shoot thinning and basal leaf removal) and cluster management with fungicide treatments applied at bloom, bunch pre-closure, the beginning of berry ripening (veraison), and near harvest. After harvest, sulfur dioxide fumigation and cold temperatures manage the disease.

Botrytis-infected Ruby Seedless berries

Sour rot/melting disorder of Redglobe table grapes

Since the late 1990s, a very troublesome sour rot of Redglobe grapes has been observed in cold storage facilities in California. Symptoms include a cracking and dissolution of the skin followed by the development of sunken decayed areas. In extreme cases, nearly the entire berry is liquefied. The origin of the disorder is not completely understood, but it is associated with several yeasts and bacteria. Methods to manage this disorder have not been developed.

We have initiated two replicated trials in Delano, CA to evaluate the effectiveness of preharvest applications of nine different fungicides registered in California to control postharvest gray mold on Ruby Seedless and postharvest sour rot/melting disorder on Redglobe grapes and to determine the most effective timing and combinations of the most promising fungicides.

Extension of Information:

A preliminary report of this project was presented at the Table Grape Postharvest Storage/Handling Workshop presented by the California Table Grape Commission held in June at the UCCE Office in

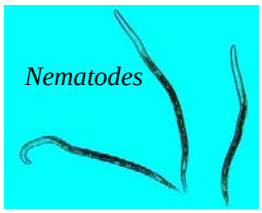
Tulare County. Approximately 40 growers and cold storage operators from Kern and Tulare County were present at the meeting. The data from this project has been shared during individual consultations with the participating grower, chemical company representatives and other local growers.

Furthermore, the results of this project will be published in various newsletters and will be presented at the 2007 San Joaquin Valley Table Grape Seminar in February.

Results and Impacts:

Fungicide evaluations are in progress and only preliminary results have been generated to date. Our goal is to develop a vineyard fungicide program, composed of one or two fungicide applications, which could reduce the number of gray mold infected berries present among stored table grapes by approximately 50% and possibly much more. A program for organic growers, presumably with somewhat less efficacy, may be developed to reduce postharvest decay. Similarly, we hope to develop effective fungicides and timing regimes to manage Redglobe postharvest sour rot, although there is little available information to estimate our success to accomplish this objective.

EVALUATION OF ROOTSTOCKS FOR TABLE GRAPE PRODUCTION



Roots of grapevines host numerous soil pests with phylloxera and nematodes (microscopic, roundworms that feed on plant roots) being the most damaging to production viticulture. In the warm regions of central and southern California, areas most suitable for growing table grapes, the root-knot nematodes (Meloidogyne spp.) are most injurious and it is estimated that these pests can reduce grapevine yields by as much as 25%.

The common management practice to overcome the damaging effects of nematodes is to use resistant rootstocks, as well as pre-plant soil fumigants and post-plant pesticides. However, growers are faced with the phase-out of methyl bromide and the loss of effective post-plant pesticides for nematode control. The use of rootstocks presents the only sustainable and long-term solution to this pest problem. Prior to selection, new rootstocks are subjected to rigorous tests, in which they are screened against a variety of nematode species and populations. While rootstock resistance is generally determined from laboratory and greenhouse experiments, it is difficult to know how they will respond in a commercial vineyard. Therefore, they must be evaluated in the field for pest resistance as well as the horticultural characteristics they impart to the fruiting variety including vigor, yield, fruit quality and nutrient uptake. The purpose of this project is to evaluate rootstock effects on horticultural characteristics of various table grape cultivars and to provide the results to growers and the nursery industry.


Table grape rootstock trial evaluation (Delano, CA)

Extension of Information to Clientele:

Results of this project were presented at the 2006 San Joaquin Valley Table Grape Symposium, the American Society of Agronomy Plant and Soil Conference, the Merced Community College Pest Management Update Class and the Coachella Valley Table Grape Growers Symposium. They are also published online at www.tablegrape.com, the website of the California Table Grape Commission.

RESULTS/IMPACTS TO CLIENTELE:

The information developed in this project offers growers more choices in rootstock selections for nematode resistance. We may also eliminate some of the new selections from commercial production if they do not perform well under field conditions.

Support Team

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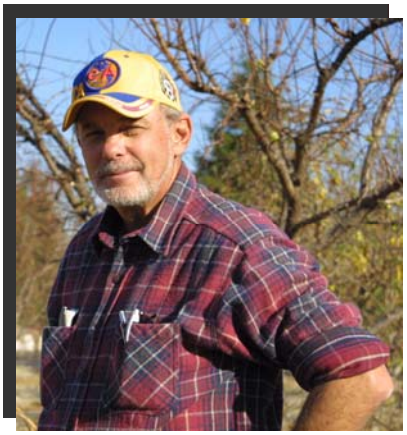
Staff Research Associate II



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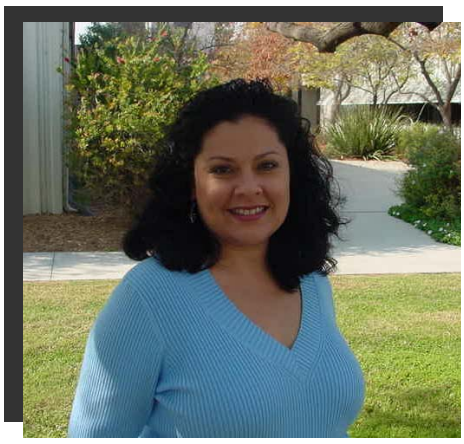

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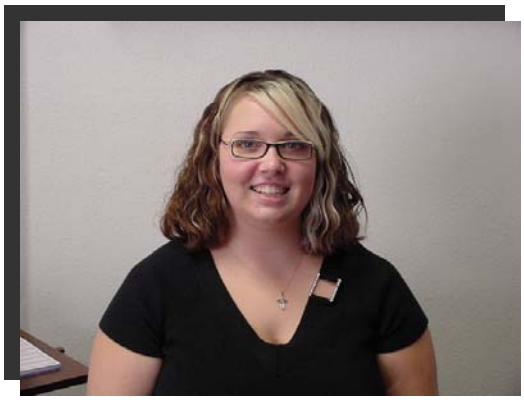

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UC COOPERATIVE EXTENSION
KERN COUNTY FARM AND HOME ADVISORS
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