

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION
KERN COUNTY FARM AND HOME ADVISORS
2004 ANNUAL REPORT



**University of California
Agriculture & Natural Resources**
Cooperative Extension Kern County



UC Cooperative Extension

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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

The year 2004 still found us in the midst of a budget crisis. The Division of Agriculture and Natural Resources of the University of California was challenged to look at how we do business and determine how we could provide support for our clientele in spite of shrinking resources.

“Listening Sessions” were held throughout the state to hear what stakeholders had to say as they discussed the importance of Cooperative Extension. Since the nearest session was at Kearney, a two-hour drive, we decided the best way to get input from our Kern County clientele was to send out a local survey.



Those returning the survey indicated that they take advantage of many program areas that we offer; pest management, field, fruit and nut crops, home gardening and commercial landscape, family and consumer science, and 4-H.

The results of the survey showed that most of our methods of delivering information are being used. Phone calls and newsletters showed the highest use rate with meetings, field days and on-farm and in-office visits close behind. About 22% of the respondents indicated that they use our web site and 15 of the 107 use e-mail to receive information. The on-farm visit was ranked the most valuable method of receiving information, although meetings, newsletters and phone calls were also ranked highly.

The respondents felt that the County-based advisors were in the best position to respond to their needs and industry needs. As one person wrote, “The local county-based office is extremely beneficial. There is no substitute for their interest, expertise and support of local needs.”

The results of this survey mirrored some of the responses at the “Listening Sessions” that were held. Cooperative Extension is valued at the local level. One written comment stated, “County advisors provide an important bridge of information between the University and the agriculture industry and information moving from the industry to the University.” That is what Cooperative Extension is all about and has been about since 1914.

In looking to the future, it is obvious that we will have to determine the important issues that affect our clientele and focus our resources. Our division, Agriculture and Natural Resources (ANR), has done just that. Many of the core issues that they identified relate closely to those affecting Kern County: pest management, food safety, youth development, and water and air quality.

Decisions at all levels reflect back on ANR's Core Values. These values have been re-confirmed as the basis for guiding action and decisions at all levels:

- The highest standards of ethical behavior, honesty and integrity, with the recognition that the trust and confidence of the public is absolutely essential to our success.
- Academic excellence and maintaining credibility as an objective source of knowledge.

- Scientifically valid research as a foundation for anticipating problems and developing practical solutions.
- Responsiveness to state and local needs in California and consideration of the global context that shapes these needs.
- Diversity within our organization, equal access to knowledge by all people and equal opportunity for self-reliance through education.
- Collaboration, teamwork and mutual respect among ourselves, in partnership with other organizations, and in interaction with our clientele.

Academic freedom, with the recognition that individual freedom goes hand in hand with a high standard of professional responsibility and personal accountability to ANR's land grant mission.

Using these core values, our advisors continue to provide the citizens of Kern County high quality research and educational programs. This report highlights more recent accomplishments.

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 50,000 acres) primarily, as well as for miscellaneous permanent crops such as persimmons, pomegranates, olives and figs. As the citrus and pistachio farm advisor, I work with growers, industry representatives, other farm advisors, UC specialists and Agricultural Experiment Researchers on the main campuses in a multi-disciplined approach to address production, environmental and marketing issues affecting growers and pest control advisors. I extend new information from my research at grower meetings, in newsletters and grower publications, on the phone, and in one-to-one discussion with growers at our office or in the field. I assist growers and homeowners in finding 'old' information on citrus that was developed over the past century and that remains time-tested and true today. A significant part of my time is spent diagnosing the cause and, hopefully, suggesting a solution for problems associated with tree health, fertility, irrigation, pollination, cultivar/rootstock selection, insects, weeds, pre- and post- harvest concerns. I often work closely with our entomologist, David Haviland, in discussing and suggesting control options for growers and homeowners when new insects appear in Kern County on their citrus and other subtropical crops.



Applied Research:

PISTACHIO BREEDING EFFORTS

Kern County is not only a center of commercial pistachio production in California, but also a center of variety improvement and development. In the 1990s, several potential varieties were bred and planted as seedlings in a cooperative test plot with a grower in Kern County. Based on their performance, they have now been grown under commercial conditions on rootstock, for eight years at one site in Kern County and for seven years at a second site in Madera County. At least one of these selections appears to be superior to Kerman, the industry standard, in several characteristics such as yield, reduced chilling requirement, split nut percentage and other nut quality characteristics. Additional selections, now in their third year on rootstocks, are being evaluated at two separate sites in Kern County. In addition, two trials comparing Iranian pistachio varieties were planted seven years ago in Kern County that contains two varieties that appear have desirable attributes of commercial value in the San Joaquin Valley.

Extension of Information: This past year, we extended information to potential growers and interested parties on these new pistachio selections at a special meeting held at the Kearney University of California Research and Extension Center and at the Annual Statewide Pistachio Day held in Visalia.

Results/Impacts: Pistachio breeding has required patience and sixteen years have passed since the inception of this research. Small plantings of one of the advanced breeding selections have now been planted by growers under test agreements with the University of California. The initial steps have been taken in the process that the University of California requires to officially release superior selections as new varieties to growers. Some growers have planted small acreages of one of the Iranian varieties (which will not require an official release by the University of California) based on its performance to date in our test plots.

MATURE NAVEL ORANGE PRUNING AND FRUIT THINNING TRIALS

Many Kern County growers, beginning about a decade ago, began to severely prune their navel oranges as a standard ranch practice. Even though it is expensive, orchards were pruned with the idea that manually pruned trees would produce more of the larger, more economically valuable fruit sizes. As described in last year's report, an experiment was begun in the spring of 2000 with a cooperating grower to help determine the effect of interior pruning and tree topping on navel orange grown with modern fertilization, irrigation and other cultural practices. This experiment is now complete after four years. The results from this trial, in combination with those from six years of experimentation with fruit thinning from 1996 through 2001, suggest that there is a constant and linear relationship between the total number of fruit produced and the most valuable fruit produced. This relationship indicates that anything the grower would do that would remove fruit from the tree, such as pruning, will reduce the total number of valuable fruit produced and grower profits.

Extension of Information: The results of this 2004 research have been presented at grower meetings in the San Joaquin Valley and at the annual international meeting of the Society of Horticultural Science that was held in Austin, Texas. Additionally, articles describing this research have been accepted for publication in peer-reviewed scientific journals that have national and international readership.

Results/Impacts: Many growers have reduced the severity of interior pruning of navel oranges, and based on this research, have probably increased the number of economically valuable fruit available for sale, and as well, increased profitability, by reducing pruning costs. Concomitantly, adoption of this research has reduced work available for labor contractors and their employees, who, previously, were paid to prune these trees. The reduction in work associated with interior hand pruning is partially offset by results showing that shorter trees 14 feet tall, and thus easier and safer trees to pick, yield as well as trees 22 feet tall.

Scientific articles and oral presentations at international meetings, like those resulting from this research, remind the nation and the world that Kern County in California is not only a leader in citrus research, but also a significant producer and seller of some of the finest navel oranges in the world.

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 Superintendent, responsibilities consist of managing Center resources to support the Division's research and educational objectives. Other duties include assisting in setting program priorities, resource planning and development of support for field research and providing for continued availability and allocation of Center resources for UC, USDA, and cooperating researchers.

Specific Highlights:



FUSARIUM WILT IN COTTON

Fusarium oxysporum f. sp *vasinfectum* (FOV) races (slight variations in genetic makeup) 1 and 2 have been widely recognized in the San Joaquin Valley since the 1950s. FOV invades and causes a wilt in a susceptible cotton variety through root damage caused by the root knot nematode (*Meloidogyne incognita*). Recently, wilt symptoms have been identified in areas without significant root knot nematode populations. FOV race 4 has been identified as the causal agent. FOV race 4 does not require root knot nematode damage to infect cotton plants. It has been identified in fields in Kern County. Chemical application or crop rotation will reduce the level of FOV inoculum in the soil but plant resistance is the most effective and economical control method. Extensive germplasm and variety evaluations have been conducted during the last two years to identify plant resistance to FOV race 4. Commercially available highly resistant varieties have been identified as have highly susceptible varieties which should be avoided in areas that have tested positive for FOV race 4. An education program of preventative and containment practices has been accomplished and continues to be a point of emphasis.



SHAFTER RESEARCH AND EXTENSION CENTER

Thirty-four field research projects for 13 University of California and USDA researchers were conducted at the Center in 2004. The six resident researchers also conducted studies in laboratories and greenhouses. One area of research is cotton germplasm development, including the evaluation and identification of molecular markers for novel traits. Three post-docs are assisting with these projects. Ten field projects and three laboratories are dedicated to insect research including identifying resistant varieties, biological control, establishing economic thresholds and pesticide efficacy evaluations. The remaining projects address agronomic management of cotton, black-eyed beans and corn including the use of remote sensing to aid in crop management.

OTHER EXTENSION AND RESEARCH PROJECTS

- Variety Trials for Acala and Pima Cotton, Wheat and Corn
- Cotton Plant Mapping Software
- Weed Control in Cotton
- Reduction in Water Use and Dust Emissions with Reduced Tillage and Drip Irrigation
- Nematode Control in Cotton
- Training videos (eg. Pruning Citrus Trees, Scouting for Cotton Insect Pests)
- Cotton Seed Treatment Evaluation
- Nitrogen and Potassium Fertilization in Cotton
- Technical Advisor for USDA-NRCS-EQIP project “Capacity Building for Adoption of Conservation Tillage Practices in California’s Central Valley”



Results/Impacts: Over 500 people attended the numerous extension meetings, field days, and tours.

Results from cotton variety trials screening for fusarium resistance have identified a highly resistant Pima variety. Much of the Pima cotton acreage has shifted to this new variety.

Growers shifted to the wheat variety Summit in 2004, 210,000 acres up from 57,000 the previous year. This newer variety still maintains its resistance to wheat stripe rust and yields well although it does have lower protein content. The very susceptible varieties Bonus, Brooks, and Express decreased in acreage from 190,000 acres to less than 20,000.

UCCE variety trials and fungicide tests have provided the necessary data to make informed decisions. Information is distributed to clientele through newsletters, field days, production meetings and on the web.

Deciduous Tree Fruits and Nuts

Mario Viveros, Farm Advisor

General Program Description: My program consists of both research and education. The research focus is on validation of research information developed by faculty at UC Davis and by researchers at Kearney Ag Center. Experiments are also established to solve local production problems.

The educational component consists of extending knowledge with indoor and field meetings, newsletters, and news releases. Our education program serves our urban and farm worker clientele as well as our agricultural clientele. Each year we offer pruning demonstrations in Bakersfield. In addition, we provide a weekly Spanish radio program that is broadcast in Kern, Tulare, Kings, Monterey, San Luis Obispo and Santa Barbara Counties.



THE ALMOND PEST MANAGEMENT ALLIANCE

The funding for this project continued for the sixth year. This project studies alternatives to pest management using low risk pesticides. These pesticides are less toxic to humans and environment.

Applied Research: The overall objective is to manage key pests of almonds (Navel orangeworm, Twig borer, San Jose scale and mites) within economic damage level. Also, to prevent secondary pests from becoming primary pests.

Extension of Information: This project has provided the information for the following publication "Seasonal Guide to Environmentally Responsible Pest Management Practices in Almonds." Also the information from this project has been presented to growers and PCA (Pest Control Advisors) in fall and spring meetings.

Results/Impacts:

- Monitoring of pests in almond orchards is the key in the implementation of a low risk pesticide program.
- Dormant sprays important in the control of San Jose scale. However, organophosphates and carbamates are not necessary in this spray.
- The use of predatory mites may or may not control web-spinning mites.
- Yield may be reduced due to San Jose scale infestation.

THE REGIONAL ALMOND VARIETY PLOT

Kern County is number one in almond production in the state. Its production is around 200 million meat pounds. This will increase as more land is planted to almond. Once a decision has been made to plant almonds, the first question is what varieties to plant to avoid potential problems and maximize yields.

Applied Research: To determine horticulture characteristics and marketability of almonds under Kern County conditions, a 22-acre plot was established in 1993 with Paramount Farming Company.

Extension of Information: Information on yields, time of bloom, maturity, navel orangeworm, hull rot and Alternaria as published in a booklet "Regional Almond Variety Plot". This booklet is distributed at our annual Southern San Joaquin Valley Meeting. It is also distributed at the Annual Almond Industry Conference in Modesto, California.

Results/Impacts: Highly productive varieties such as Nonpareil, Monterey, Fritz, Butte, Carmel and Padres are being planted. These varieties have been responsible for yield per acre increase in Kern County. It is not uncommon to find orchards with a 3,000 or 4,000 meat pounds production.

ALMOND PRUNING

Almond pruning has become an air quality issue. By 2006 growers are not going to be allowed to burn almond prunings during winter. Therefore, it is important to examine pruning practices.

Applied Research: Two experiments were established to evaluate the value of pruning. One was established in 1998 with the following treatments: 1) no pruning, 2) prune every year, and 3) prune every-other-year. The second was a mechanical pruning experiment with the following treatments: 1) hand pruning, 2) hedged, 3) topped, and 4) hedged and topped.

Results/Impacts: Yields weren't affected by any of the pruning treatments. In fact, the biggest production was in the no-pruning treatment. Furthermore, the hand-pruned treatment produced the most pruning brush. Therefore, pruning shouldn't be done to increase or maintain yield. In fact, pruning can lead to increases in production cost and represent a source of air pollution when pruning brush is burned by growers. Some growers have accepted the results of this experiment because it represents savings in production cost. They have also become aware that in the near future no burning will be allowed in Kern County.



Mario demonstrates tree pruning.

ALMOND LEAF SCORCH

This disease appeared in Kern County in 1997. At that time there was only one orchard affected, however, by 2000 the number of orchards showing the disease increased by five. This year the disease is widespread from Wheeler Ridge to Delano and the disease is present in 25 orchards.

Applied Research: We are working with Russell Groves from the USDA, San Joaquin Valley Research Center to determine how this disease is spreading within and among almond orchards.

Extension of Information: Our growers have been kept informed on the spread of the disease in our county. We held a field meeting where growers learned to recognize and diagnose infected trees. As more information is developed, growers will be informed about the disease in field and seminar meetings.

Results/Impacts: Almond growers were informed about the seriousness of this disease in our field meetings. Growers have responded by taking infected trees out as it was suggested at the meeting.

ALMOND TRAINING FOR A CATCH FRAME HARVESTER

The almond harvest (shaking, sweeping and pick-up) creates an estimated 11,220 tons of dust. In fact, each time one acre of almonds is harvested, 41 pounds of microscopic dust particles are produced (PM10). Some orchards are harvested three times. By comparison, wheat raises 5.8 pounds of harmful dust per acre harvested, while cotton raises 3.4 pounds. If one of the steps of almond harvest is eliminated, the amount of dust in the air will be dramatically reduced by 30 percent.

Applied Research: A pruning (training) experiment was established in 2003 to determine the height of an almond tree head for a catch frame harvester. This will eliminate the sweeping step during harvest which is a major dust-producing component of almond harvest. This experiment includes the following head heights: 1) standard or 42 inches, 2) 52 inches, and 3) 60 inches.

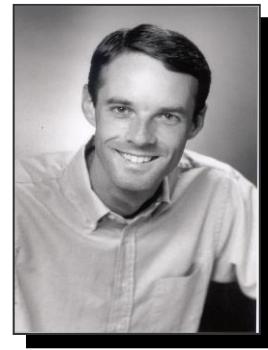
Extension of Information: When the information becomes available, it will be presented to our growers through reports, field demonstrations and indoor meetings.

Results/Impacts: If almond trees can be trained to a high head, growers will have the alternative of using a catch frame harvester for almonds which will reduce the amount of dust during harvest.

Entomology and Pest Management

David Haviland, Farm Advisor

General Program Description: The primary function of the entomology program in Kern County is to identify key agricultural pests, seek out information on their biology, develop control strategies, and provide this information freely to farmers and homeowners. The trickiest part of the process is developing strategies that are safe to people and to the environment, and that are not cost-prohibitive to the farmer. The costs to farmers associated with managing insect pests range from insignificant to devastating. Oftentimes the only difference between the two is the amount of knowledge that has been developed about a pest, and what strategies we have come up with to control it.



Situation: During the past year, the entomology program has dealt with several insect pests of recent introduction into Kern County. These include the glassy-winged sharpshooter and vine mealybug, which are both serious agricultural pests, as well as five others that have showed up within the past year; namely the Texas citrus mite, giant whitefly, woolly whitefly, an unidentified spider mite, and striped mealybug. Each of these new pests causes damage to one or more agricultural commodities or urban landscape plant.

Control of each of these new pests has required a different approach to pest management. Texas citrus mite, for example, can be controlled by irrigation management and keeping citrus trees from becoming stressed for water. Giant whitefly can be controlled in the short run by washing trees with water at high pressure, and in the long run by tiny, parasitic wasps which we have begun to release into the county. In the case of striped mealybug, insecticides will have to provide immediate suppression of this pest while more sustainable approaches that don't require pesticides can be developed.

In each of these and other cases, the entomology program in Kern County has had a key role in coordinating pest control programs. With vine mealybug, solving the issue has required cooperation between the University of California, the Kern County Agricultural Commissioner's office, the California Department of Food and Agriculture, Grape Nursery Commodity Boards, and individual grape nurseries. Other issues have required similar coordinated efforts, without which, many of these programs would likely dissolve.

Extension of Information: Extending information is another key part of the Kern County entomology program. During the past year, articles directed towards farmers have been published in at least ten different trade journals, agricultural news publications, and Cooperative Extension newsletters. I have also spoken at over a dozen meetings in Kern County and have been invited to give presentations at meetings in six other counties. Information has also been presented to the general public through the Bakersfield Californian and local television news programs, through guest lectures at multiple school and educational events, and to volunteer programs such as the Kern County Master Gardeners.

I have also provided general services to the public. During the past year I performed over 200 insect identifications and or consultations regarding pest management to general homeowners. In each of these consultations I provided information that helped homeowners become aware of the control options available, and helped them to deal with a variety of pests, often without the use of pesticides.

VINE MEALYBUG

Vine mealybug is quickly becoming a serious pest of grapes throughout California. Compared to other mealybugs that have infested grapes for decades, this new species has more generations per year, produces more offspring, and overwinters underground where it is protected from control measures. Many grape growers battling this pest are forced to spend between \$150 and \$200 per acre annually in insecticide costs just to control this one pest. If left uncontrolled for even a couple years, entire crops and vineyards would be ruined.



Vine mealybug has also had severe impacts on grape nurseries in Kern County. Allegations have been made that infested nursery materials were shipped from Kern County to approximately seven other counties that previously did not have this pest. These allegations resulted in a severely tainted reputation for Kern's grape nursery industry.

My program has worked with the nursery industry to develop a monitoring and treatment program that is effective and affordable for use by the nurseries. During the past couple of years, we have been able to establish an integrated pest management program for the nurseries and identify hot-water treatments as a potential method for treating dormant grape cuttings.

Extension of Information: As a result of our research, nurseries throughout Kern County and most of the State have adopted the use of hot-water treatments for dormant nursery vines. They are also following protocols we have recommended for the use of pheromone traps and sanitation. As a result, it appears that the movement of nursery plants has been completely removed as a means of spread of this pest throughout the state. This is extremely beneficial to growers who can now buy nursery stock without the concern that it might be infested with this pest as well as to the reputation and viability of Kern County nurseries.

WOOLLY WHITEFLY

Woolly whitefly is a pest of citrus throughout much of the world, but until recently had not been found in the San Joaquin Valley. Since it was first introduced last fall, this pest is now found on most backyard citrus throughout the northeast part of Bakersfield, and is advancing towards commercial citrus production areas in Kern County.

Woolly whitefly damages citrus trees by sucking out vital plant juices. White sugary excretions from the insect can completely envelop the undersides of citrus leaves and make all surfaces under the trees extremely sticky. As a result, trees can become defoliated and backyard areas under the trees can become unusable.



Results/Impacts: Information developed through the entomology program is solving this recent backyard problem. We have identified that repeated washing of the trees with high-pressure water will remove the majority of the insects. This has been a welcome alternative to the numerous pesticide applications many homeowners have been using with little benefit. We have also identified parasites that will feed on and kill woolly whitefly, and we are currently importing those into Kern County to control this pest.

Environmental Horticulture/Environmental Science

John Karluk, 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 disseminates information about recent research results and fundamental principles and their application to professional landscape managers. Six news releases were also prepared.

QUESTIONS AND ANSWERS FOR KERN COUNTY RESIDENTS

A principal activity of the environmental horticulture program is providing information to Kern County (KC) residents to answer their questions. Requests are received via the phone or email pertaining to growth, culture, and pest management of plants. During this year, technical consultation has been provided to the KC High School District, the Lamont School District, the Department of Airports, the KC District Attorney's office, Riverlakes Ranch Homeowner's Association, National Chavez Center, the Pierce's Disease Control Program field station, KC Parks and Recreation, City of Bakersfield, KC Waste Management, as well as numerous golf courses, landscape companies, and private individuals. In many cases, supplementary written reference material was sent gratis.

UCCE-SPONSORED LANDSCAPE MANAGEMENT SEMINAR

In January of 2004, 80 people attended the landscape management seminar, held annually since 1985. The seminar continues to be a good forum for dissemination of new knowledge, discussion of pest management methods, reminders of cultural practices, and updates of laws and regulations.

Results/Impacts: My presentation this year was a discussion of the chemistry and use of organophosphate pesticides, allowing the participants to gain an understanding of how these chemicals work and their connection to human health.

COCCIDIOMYCOSIS (VALLEY FEVER) MEETING

An informal meeting to discuss possible environmental associations with the incidence of valley fever was convened by Dr. Tom Larwood at the Kern County Medical Center in March. A similar meeting was held about two years ago. I presented information and changes in cropping patterns over the past sixty years, fungicide use, behavior of aerosols. The recent spike in valley fever cases does not appear to be associated with changes in agricultural practice.

MASTER GARDENER CLASSES

Interest in horticulture continues in Kern County, from both homeowners and those involved in commercial landscape and nursery enterprise. In spring, 2004, a 16-week Master Gardener (MG) II class with an enrollment of 20 was held in cooperation with the Weill Institute. We discussed horticultural practices, including planting and care of roses, irrigation design, specialty plants, and other topics beyond those covered in the MG I class. In fall, 2004, an MG I class was offered with 60 enrolled, and an MG III class was also offered with an enrollment of 30. The MG III class was offered for the first time, and included advanced horticulture concepts and practices. Each of the MG classes was held for 16 weeks, three hours per night.

Results/Impacts: Through class presentations, the students were given up-to-date horticultural information for Kern County applicable to the home garden or in a commercial setting.

PRUNING DEMONSTRATIONS FOR FRUIT TREES

(Collaborator: Mario Viveros, UCCE Kern County)

The salubrious climate of Kern County allows many halcyon days for culture of home fruit trees. Consequently, the Farm Advisor's office receives many requests for information on establishment and pruning of deciduous fruit and nut species. As in previous years, we offered pruning demonstrations two days in December, at the demonstration orchard at the UCCE office. We also made available fruit tree publications we wrote, which were printed through the county reprographics service.

Results/Impacts: Attendees improve their pruning practices for fruit trees.

ROSE INDUSTRY

The annual rose production meeting was held in September. Brent Pemberton of Texas A&M spoke at the meeting, and introduced the 2005 International Rose Symposium to area rose growers. The Symposium planning is underway, with Santa Barbara selected as the site. A Garden Rose Council meeting followed the production meeting.

Results/Impacts: Research developments in pest management and cultural practices were presented, as well as an update on laws and regulations.



Kern County is home to about 55% of rose plant production in the U.S.

RESEARCH: AIR QUALITY

Additional data and research results were compiled, and two manuscripts prepared and submitted, based on studies conducted by our group in the Central Valley. These studies were conducted to help the California Air Resources Board improve biogenic emission inventories.

In September, I gave a technical presentation at the California Air Resources Board office on the subject of biogenic hydrocarbons. I have been participating the agricultural advisory committee meetings held at the Fresno Air Pollution Control District, and also the pesticide-working group via conference calls.

I have begun working with Frank Mittloehner of UC Davis on VOC (volatile organic compounds) emissions from dairy cows.

It is clear more work related to air quality will be needed in the San Joaquin Valley. Three proposals have been submitted for research, to be conducted in the San Joaquin Valley, pertaining to air quality impacts from crop plants.

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

RESEARCH: LOST HILLS ALMONDS STUDY

(Collaborators: Blake Sanden, Mario Viveros, and Darlene Liesch, UCCE Kern County)

Field sampling was completed for a study to evaluate the uptake into almond trees and potential toxicity of selected chemical elements. This study is funded by the Waste Management Department, County of Kern. Data are being analyzed, and two researchers at UC Davis are 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.



Replicate samples were taken of almond leaves and fruit, and sent for laboratory analyses.

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 programs and school enrichment programs.



Specific Highlights:

4-H/ROP

In 2003, the Kern County 4-H program and the Kern County Probation Department formed an alliance to enrich the lives of troubled youth. The 4-H Early Intervention Program (EIP) was implemented to provide 4-H experiences to youth 8 – 14 years of age who do not have the family support system to involve them in a traditional club. The Probation Department lost their funding and could not continue EIP. The probation officers involved in EIP were sent to other prevention programs within the department. These officers appreciated the 4-H experience and noted an improvement in the attitudes of the youth involved in EIP. They approached the Extension Staff to bring 4-H to the next level of young people within the probation system, the Repeat Offender Program (ROP). ROP includes young people who are already in the legal system and need structure and positive reinforcement to enhance their development. Probation officers transport the youth to a 4-H project meeting every week. The youth receive hands-on instruction in project skills provided by 4-H staff and volunteers. They take part in various projects that are part of the 4-H Program. For example, they learn about food preservation by making jerky and fruit rolls. They learn about wood working by building a toolbox. They learn about rockets and then have the opportunity to build and launch one.

Results/Impacts: The first group of youngsters is currently participating in their series of projects. The youth are receiving 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 for its efforts. The program has received two grants to help offset the cost of supplies and equipment used by the participants. One grant was from the Probation Auxiliary County of Kern (Pack) and the other was from the Thomas and Dorothy Leavey Foundation.



Youth participants launch rockets they made in the 4-H/ROP program.



Youth participants learn about electricity and assemble extension cords in the 4-H/ROP

SUMMER OUTREACH 2004

The Summer Outreach Program is provided as an educational extension project through the Kern County 4-H program. The program involves 4-H staff visiting youth serving locations throughout the community over a six-week period. Many children do not have the opportunity to join a 4-H club for a variety of reasons, be it location, transportation, or cost. This program brings 4-H to areas that have under-represented populations in the traditional program. Each week for six weeks, sessions were held at the David Head Recreation Center, Mercy Learning Center, DiGiorgio Park, Police Activities League, Kristine Apartments, and the Housing Authority of Kern. Children received hands-on experiential learning about seeds, plants, fruits and vegetables, and bread making.

Results/Impacts: The 2004 Summer Outreach Program reached 408 youth and provided them the opportunity to participate in a structured environment that enhanced their awareness of sciences and learning.



Children enjoying one of the activities at the 4-H Summer Outreach Program.

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 collaboratives to bring this idea to fruition. My role in this project has been to meet with a community collaborative in Pasadena and formulate a plan for studying their efforts and impacts. Youth and adults in the project will be interviewed in the winter of 2005. Upon completion of this project, I would like to use the methods and techniques used in this study to implement a similar smaller scale study of a collaborative in Kern County.

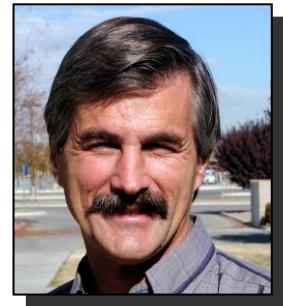
Irrigation and Agronomy

Blake Sanden, Farm Advisor

General Program Summary: My irrigation and soil management program focuses on two major areas:

- 1) Irrigation system management – crop water requirements, irrigation scheduling, water quality, system efficiency
- 2) Salinity/fertility management – crop salt tolerance, soil quality and nutrient availability

The **agronomy** portion of my program focuses on traditional commodity responsibilities for production of alfalfa and forage crops, dry beans, sugar beets and safflower.



Educational & Professional Outreach: Over the last year I have presented the results of my Kern County research projects, and general soil/water management presentations at 24 county level field days or seminars, 20 statewide meetings, 2 international meetings and in more than 25 publications consisting of newsletters, project reports, popular press and scientific journal articles. The major topics for these presentations include resource management issues such as greenwaste compost and sewage sludge application to farm land, irrigation system uniformity/scheduling, sprinkler management in vegetable crops and salinity tolerance and amendment management. Educational efforts also include field days, research projects and commodity meetings for alfalfa, carrots, 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.

Research (Example Projects):

Project One – Continuing Project:

FIELD IRRIGATION MONITORING, SCHEDULING AND WATER USE EFFICIENCY

Situation: High water costs and low commodity prices mean growers have to be as efficient as possible with irrigation water. Average Kern County irrigation efficiency was estimated to be 95% over the 110 fields examined in the study—a far better standard than the 75 to 80% work usually considered "good" for California agriculture. 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 and crop yield.

Field Study: Starting Winter 2001, Kern UCCE worked together with the area Resource Conservation District Irrigation Mobile lab to instrument growers' 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 weekly irrigation scheduling recommendations also containing a seasonal summary of CIMIS ET estimates, soil moisture and applied water history. Additional fields on the Westside of Kern County were added to this program in 2002 as part of a CalFed Ag Water Use Efficiency project. More grower fields were set up in 2003 and 2004 for a total of 110 fields covering 9,000 acres belonging to 24 different growers in 12 different crops, 11 soil textures and 9 different irrigation system types.

The frequency of grower reference to field loggers and faxed irrigation schedules ranged from almost nil to very high; with a serious look at the soil moisture data in the weekly faxes and/or field loggers averaging once every 2 to 14 days. Overall grower response was positive, with most stating that the program had made their irrigation more efficient and/or improved crop yield and quality. Often the degree of scheduling responsiveness was limited by ranch logistics and available labor. Many of these fields, primarily low volume systems using expensive water on the Westside, were near optimal or deficit irrigated before entering the program, and, in some cases, soil moisture deficits recorded with this demonstration effort called for increasing applied water.

Extension of Information: In 2004, the results and extended application of these techniques to other settings has been presented to an additional 200 people, arriving at a total of more than 800 people reached during this four-year project.

Results/Impacts: Due to improved schedules and farm calls, one to two irrigations on more than 2,000 acres of furrow-irrigated cotton was saved. As in the past two years, cotton, almonds and grapes showed increased yields. 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 and cannot afford further loss of water supplies.



Placement of logger and soil moisture monitoring equipment near microsprinkler and tree in 5th leaf almonds.
(Chart @18" depth)

Project Two:

IMPROVING INFILTRATION AND ALMOND YIELD WITH WATER-RUN GYPSUM

Situation: A significant acreage of almonds in the San Joaquin Valley have soil sealing problems and can experience a severe deficit of available water as the summer advances. This is particularly true for some surface-irrigated fields. Over the last 15 years many almond growers have started using gypsum solutionizer machines to inject gypsum directly into the water for irrigation either by surface flooding or application through drip or microsprinklers. Where growers cannot afford the machines and the more expensive “solution gyp”, most flood orchards broadcast gypsum in the winter and then find the benefit is gone by June, when it’s really needed. Broadcasting during the season is not an option as the spreader would damage trees once they were loaded down with nuts. Excessive deficit conditions can reduce nut size and crop yield.

Applied Research and Creative Activity: Starting in 2001, about 250 lbs of an inexpensive 75% purity gypsum was piled by the alfalfa valve at the head of ¼ mile checks in a 20-year-old almond orchard near the end of May and again in the middle of July (350 lb/ac/application). The gypsum is simply carried down the check as it dissolves into the water. Replicated Control checks received no gypsum. Replicated yields of Butte almonds have been taken for the last three years.

Extension of Information: The results of this trial have been presented to 500 people in two statewide meetings, one field meeting and numerous farm calls, two popular press articles and one newsletter.

Results/Impacts: This simple technique only costs about \$6/ac/application. Soil water storage increased only slightly by 10 to 15% for the gypsum application, but significantly improved nut size and total meat yield by an average of 283 lb/ac/yr over three years over trees not receiving gypsum for an average of 3,125 lb/ac meats. This is a \$400/ac income boost to the grower with nut prices of \$1.50/lb.



Side-shot application of 250 lbs of 75% gypsum by flood valve at head of check.

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 covers six or more blue oak projects with most of the effort directed toward seedling survival and 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.



Specific Highlights:

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 people the background to get started and will be available before July 2005.

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. A study was undertaken looking at both livestock and wildlife in relation to the waterborne pathogen *Cryptosporidium* spp. Studies of this waterborne pathogen in this county are being summarized and published.

Results/Impacts: The work has shown that it takes 13 cows to equal one squirrel in terms of the number of *Cryptosporidium* spp. pathogens being deposited in the environment. Also, the work has discovered a new species of *Cryptosporidium* spp.

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 15-years, the study of blue oak seedlings has indicated that a group of natural 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.

FOOD SAFETY

There are concerns that range cattle may be carriers of two human pathogenic bacteria. The perception is that beef cattle are the only source of these bacteria. However, there is no information available that has looked at the prevalence of these organisms in range beef cattle. This study will measure the prevalence of these bacteria in range beef cattle. This is a nationwide study.

We are studying three beef herds for *Listeria* sp. and one herd for *E. coli* 0157-H7. These herds are sampled four times a year. Fecal, forage, water and soil samples are taken from each herd. This study will determine if range beef cattle are a food safety concern.

Results/Impacts: At this point, there does not appear to be a human health concern.

Nutrition, Family and Consumer Science

Margaret Johns, Advisor

General Program Description:

NUTRITION EDUCATION PROGRAMS

TRAINING EXTENDERS TO TEACH NUTRITION EDUCATION

Over 20% of the county's population lives at, or below poverty level and 57.5% of the K-12 children live at 185% of poverty level or below. Once basic survival needs are met, nutrition education plays an important role in family resource management, and increases health and wellness opportunities for families.



The Adult Expanded Food and Nutrition Education Program (EFNEP) reactivated its Extender Training Program for Head Start Home Base Teachers. The program trains the Head Start Home Base Teachers to teach the Adult EFNEP nutrition education curriculum to families with small children, who otherwise would not be able to participate in this program. Most of these families live in the rural outlying communities. Each Home Base teacher is required to teach the curriculum to ten eligible families. This program graduates approximately 125 families.

As of this fall the Extender Training Program has been expanded. Eighteen participants from community schools and agencies are currently receiving training. This is a pilot project, which is allowing the program to grow without increasing program cost.

Research Methods: The Adult EFNEP program utilizes pre- and post-training checklist to document behavior change in food habits. This data is reviewed annually to determine success and develop strategies for improving behavior change.

Extension Methods: The Adult EFNEP Nutrition Program Manager conducted 12 hours of training to the Head Start Home Base Teachers. Class handouts are available in English and Spanish.

Results/Impacts: Analysis of the Food Behavior checklist data, documents participants demonstrated an 77 percent improvement in food resource management practices, 86 percent improvement in nutrition practices and 52 percent in food safety practices. Sixty four percent of participants demonstrated improvement in all three categories.

Situation:

CONSUMER ECONOMICS

Earned Income Credit (EIC) is a special tax benefit only for people who work full-or part-time and is one of the U.S. government's most important work promotion and anti-poverty programs. Low-income working families can receive EIC even if they do not owe taxes. This program assists families to get out of poverty by providing them with a lump sum of money or monthly increases in their wages. Many eligible families do not utilize this program. In 2002, the IRS estimated that 35 million dollars in EIC benefits was not claimed in Kern County.

Another problem associated with low-income families and filing for taxes is the fees they pay to commercial tax preparers. Nationally low-income taxpayers filing for the Earned Income Tax Credit spent more than \$1 billion in 2001 for tax services, which included paying commercial tax preparers, electronic filing fees and rapid refund cost.

VITA (Volunteer Income Tax Assistance) programs have been offered in Bakersfield thru California State University Bakersfield and the Mexican American Opportunity Foundation. These services have not been offered in the outlying communities where large numbers of low-income, Hispanic families reside.

In collaboration with the Kern County Department of Human Services and Community Action Partnership of Kern, the EIC Family Self-Sufficiency Coalition was formed in 2004. This coalition is addressing the need for increasing access to the VITA program, increasing bank usage and providing money management information to low-income families in Kern County.

Extension Methods: I spoke at the Network for Children's Kern County Collaboratives December meeting to recruit interested agencies to assist with this project. I then organized and have chaired the EIC Self Sufficiency Coalition. To date the coalition has organized two trainings conducted by the IRS: How to Start and Manage a VITA Site and How to Complete the ITIN Forms. Training for the volunteer tax preparers is scheduled in December and January.

Results/Impacts: The Department of Human Services is planning on starting four new VITA sites; Delano, Shafter-Wasco, Mojave and the OC Sills Building in Bakersfield. Community Action Partnership of Kern is starting two new sites; Lamont-Shafter and South East Neighborhood Partnerships office on California Ave.

The dollar impact of the EIC Self Sufficiency Coalition's work will not be evaluated until after this year's tax season is over. We are currently collecting baseline data from the existing programs.



IRS Training for coordinating a volunteer Income Tax Assistance Program.



Jan Gillespie, Nutrition Program Manager,
training Nutrition Extenders.

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. I identify and prioritize the research needs in cooperation with UC specialists, other farm advisors, and growers to conduct and coordinate applied research projects. By the use of meetings, newsletters, farm calls, and mass media I extend the findings of these research projects along with other research based information. In addition, I help answer questions and solve problems that the general public may have in areas that I have some expertise.



ONIONS

New Disease: An unusual disease appeared on fresh market onions in the Rosamond area of Kern County. A few days later a growers contacted our office describing a similar problem in the Mettler area. The plants developed leaf blight on the outer, older leaves while the younger, inner leaves became very bright yellow. The onion bulbs remained sound although they did not size well. The problem appeared to have started in one variety and spread to other adjacent varieties.

Applied Research: Initially it was thought that the disease was an unusual form of xanthomonas leaf blight which was discovered in that area in 2001. However samples from Rosamond and Mettler where sent to UC Davis and to Colorado State University where both places identified it as *Erwinia herbicola*. This is a disease that occurs sporadically in Colorado and other onion growing areas but this is the first time it has been observed in California.

Extension of Information: The results where shared with the onion growers of the Antelope Valley and were presented in a meeting with crop consultants in Kern County to make them aware of the problem.

POTATOES

Green Manure – A continuing project: It is a common practice for Kern County potato growers to grow potatoes each year in the same field without the benefit of a crop rotation. Because of lack of rotations, soil borne pests can build up to damaging levels. To alleviate the problems of soil borne pest, growers fumigate theirs fields before planting potatoes or other crops. Issues of worker safety and drift onto nearby homes and schools have put severe restrictions on the use of these products. The use of mustard cover crops used as a green manure may be a possible method of reducing the reliance on soil fumigants and at the same time increase soil quality.

Applied Research: A mustard cover crop was planted and incorporated as a green manure in a section of a field that was heavily infested with root knot nematode following carrots. The rest of the field was rotated into wheat. Soil samples taken following the incorporation of the mustard revealed that root knot nematodes

levels were moderately high following wheat but were not detectable following mustard. Also, the level of free living nematodes was 10 times greater following mustard than following wheat, which is an indication of good soil health.

Extension of Information: There is a great deal of interest in these trials by the potato and carrot industry. The results were presented at the annual Washington Vegetable Conference in November. A research report will be prepared and presented to the California Potato Research Advisory Board. Results will also be released in a newsletter and meetings to local growers and consultants.

Results/Impacts: I have shared the information with several growers who are beginning to use mustard green manure and have started a new trial with one grower. State agencies have shown an interest in the project as a method of reducing VOCs (volatile organic compounds) from soil fumigations.

BACTERIAL EARLY DYING – A CONTINUING PROJECT

Bacterial early dying is a plant disease of potato that is of extreme importance to our local producers. The disease is caused by a bacterium that begins growing on the seed piece. As the seed piece rots, the bacterium moves up the stem and causes a wilting symptom. The bacterium also moves from the rooting seed piece onto the developing daughter tubers causing post-harvest losses as well.

Applied Research: Our previous research has shown that calcium applications during the season will help suppress post-harvest problems. Previous research we have done has also shown that seed tubers grown with calcium will help prevent seed piece decay. This year's trials have shown that a toxin is produced within the plant that may be responsible for the plant die-back. It is not known at this time if the toxin is produced by the bacteria or by the plant in response to the bacterial infection.

Extension of Information: This information has been presented in newsletters, grower meetings, field days, and annual reports.

Results/Impacts: This is new information which will take time to show impact.



Joe checks soil after incorporating
mustard cover crop

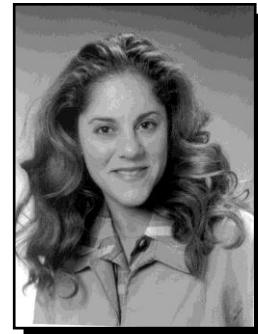


Jed DuBose and Shalyne Van Worth calculating
carrot trial for cavity spot.

Viticulture

Jennifer Hashim, Farm Advisor

General Program Description: The Viticulture Farm Advisor provides a broad based, off-campus education and research program in the fields of viticulture, small fruits production, post-harvest handling, and pest/pathogen management. 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. In Kern County, there are more than 90,000 acres of grapes. However, specialization in table grape production is required due to their economic contribution to the area.



Research Highlight 1:

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

Situation: The epidemiology of Pierce's Disease (PD) changed dramatically in Kern County with the arrival of the glassy-winged sharpshooter (GWSS) about seven years ago. Before that time the disease caused losses, but the damage accumulated gradually resulting in the loss of a small percentage of vines. With the arrival of the GWSS, however, PD spread has increased logarithmically, such that large sections of vines were destroyed in less than two years.

The cooperative area-wide pest management of the GWSS project has defined seven distinct grape growing areas in Kern County. These areas represent various "stages" in the PD epidemic, ranging from the General Beale area—where GWSS was first observed in 1997 and where the epidemic occurred first and has been most severe—to the Highway 65-Delano area where GWSS was first observed in 2002 and where there is still very little PD. This variation among growing areas in combination with the significant accumulation of field data about these areas makes Kern County an ideal area to study PD.

Applied Research: In August 2002 two coordinated projects led by the University of California Cooperative Extension (UCCE) and the California Department of Food and Agriculture (CDFA) Pierce's Disease Control Program began as five-year projects to obtain extensive data about the incidence and control of the disease. These projects involve surveying affected vineyards, identifying diseased vines, and mapping the locations of these vines in a GIS based data system. This disease information complements the insect trapping data and will enable understanding of the dynamics of the epidemic and methods to control other potential outbreaks. A total of 197 vineyards with 3,864 acres were surveyed for PD, about 4.6% of the county's total vineyard acreage in 2004.

Extension of Information: Information and updates on the project are presented during the Kern-Tulare GWSS/PD taskforce meetings, the CDFA Pierce's Disease Research Symposium in San Diego and the Kern Grape Pest Management annual meeting. Cooperating growers also receive personal updates by phone or fax and on-farm visits are coordinated to help growers develop their own annual PD monitoring programs.

Results/Impacts: Vineyards in the seven grape production areas of Kern County's area wide management project were surveyed for PD again in 2004. Incidence of PD in the highly affected areas (General Beale and Northern area) peaked in 2002, and declined dramatically in both 2003 and 2004. The results thus far in the General Beale area indicate that the dramatic decrease in the number of infected vines is continuing. The continued decline of PD in this area demonstrates that effective PD control can be obtained with a combination of treatments for GWSS control, monitoring for diseased vines, and removal of confirmed diseased vines. These projects have demonstrated that vineyard disease monitoring and vine removal is cost effective.



PD survey crew (from right to left): Brett Molica, Julie Wooden, Auggie Morales, Murray Pryor.



PD survey crew unloading ATVs.

Research Highlight 2:
EVALUATION OF ROOTSTOCKS FOR TABLE GRAPE PRODUCTION

Situation: Root feeding pests, such as nematodes and phylloxera have been persistent problems in grape production. In the past, growers have relied on the use of resistant rootstocks, pre-plant soil fumigants and post-plant materials to keep existing populations at bay. Currently, growers are faced with the phase-out of methyl bromide and the loss of effective post-plant pesticides. It is important to continue the evaluation of new rootstocks for table grape production, as rootstocks continue to play an integral role in our soil-borne pest control program.

Applied Research: Five replicated test plots consisting of different varieties of grape grafted onto rootstock selections are evaluated per year. Fruit quality, color development and yield are assessed at harvest time as well as the vigor of the vine.

Extension of Information: Results are published online and in the California Table Grape Commission's research report that is distributed to all table grape growers who pay assessments to the group. Information is also available to individual growers during field consultations.

Results/Impacts: 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 in that they may not perform well under field conditions.



Princess rootstock trial in Arvin



Collecting yield data at rootstock trial in Delano.

Research Highlight 3:

EVALUATION OF NEW HERBICIDES FOR WEED MANAGEMENT IN VINEYARDS

Situation: Weeds compete directly for water, nutrients and other valuable resources required for vine growth and profitable production. Weed management is especially critical during the first four years of vine establishment, as heavy weed growth around the trunk can decrease root growth and provide a good habitat for field mice or voles, which can girdle and kill young vines. Weed control, especially in the area next to the base of young vines, is critical for optimum production and plant health.

Applied Research: Four pre-emergent herbicides were evaluated in a replicated test plot within a young, non-bearing Autumn Royal vineyard in Delano, CA. Herbicides were applied to the vine berm during February 2004 and evaluated on monthly intervals through the end of September.

Extension of Information: Project was presented at the 2004 Kern Grape Pest Management meeting in November.

Results/Impacts: Herbicides play a vital role in vineyard weed management. Many herbicides are registered for use in California, but none control all weeds present in any given vineyard. Therefore, efforts to test new herbicides are ongoing to provide choice to growers and effective weed management.

Support Team



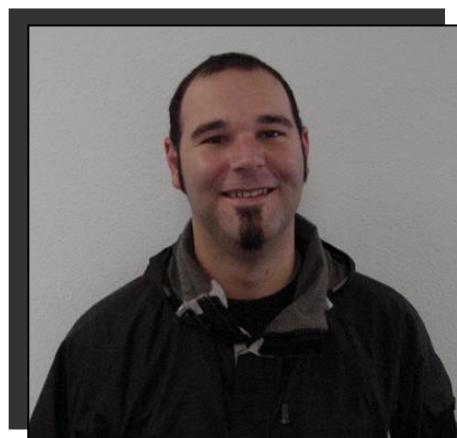
Peggy Schrader
Staff Research Assistant I



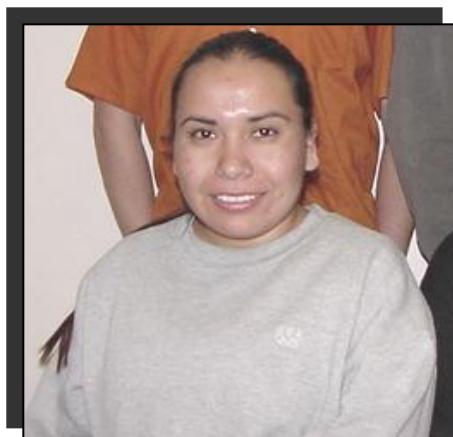
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Mike Mauro, Lab Assistant II



Minerva Gonzalez
Lab Assistant I

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Nutrition Program Manager -EFNEP



Karen Bayne
Youth Coordinator-EFNEP



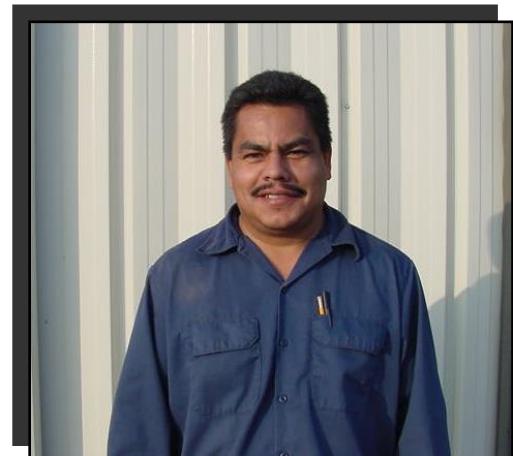
EFNEP ASSSISTANTS

Left to Right: Doreen Guerrero and Bea Ramirez

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Pam Mouser
4-H Program Representative



Rick Ramirez
Ag Field and Equipment Specialist



CLERICAL

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

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**UC COOPERATIVE EXTENSION
KERN COUNTY FARM AND HOME ADVISORS**
December 2004

Appointed: University of California
COUNTY DIRECTOR
Darlene Liesch

| | |
|---------------------------|------|
| UC Personnel Academic | (12) |
| UC Personnel Non-Academic | (11) |
| Kern County Personnel | (6) |

