UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

KERN COUNTY FARM AND HOME ADVISORS

2012 ANNUAL REPORT




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UNIVERSITY OF CALIFORNIA
AGRICULTURE & NATURAL RESOURCES
COOPERATIVE EXTENSION KERN COUNTY

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. More than 1,000 Kern County youth between kindergarten and age 19 currently participate in 4-H programs and hundreds of adult volunteer leaders serve as mentors and teachers to these youth.
- **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 healthy 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.
- 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.

UC Cooperative Extension
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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 55,000 acres) and pistachios (approximately 65,000 acres) primarily, as well as for miscellaneous permanent crops such as persimmons, pomegranates, olives and figs.

Projects/Applied Research:

PISTACHIO BREEDING AND EVALUATION CONTINUES

University of California Cooperative Extension in Kern County has been a leader in producing new cultivars (i.e. cultivated varieties) for the pistachio industry in California. Kern County which, because of its climate, soils and growers; leads the nation in the production of pistachio nuts.

Increasing world market competiveness for any crop grown in California requires innovation and ever increasing efficiency in resource utilization. The introduction or development of new cultivars with better climatic adaptation, resistance to diseases, early or later maturity, increased productivity or novel fruit or nut quality characteristics has been an important engine for maintaining the economic viability of California growers and the local economy as a whole.

In the spring of 2011 a large-scale pistachio breeding effort was conducted by this office in Kern County utilizing the large array of pistachio germplasm that now exist in Kern County thanks in large part to funding by the California Pistachio Research Board (i.e. the grower commodity group for pistachio) and the generous support of local growers. Seeds resulting from genetic crosses made in 2011 were germinated, planted in pots and transferred to a cooperating grower's orchard for evaluation in 2012 and beyond.

Evaluation of advanced selections that are further along in the process toward possibly clearing the high hurdle of becoming new cultivars continued in 2012 with the first harvest of a block of five-year old trees in the Buttonwillow area. One selection was harvestable 11 days earlier than the earliest commercial cultivar in this trial.

Three University of California cultivars, 'Golden Hills' and 'Lost Hills' (female trees) and the 'Randy' male tree, which were released to the pistachio industry in 2005 are increasing in acreage, and continue to show promise for the industry. The nuts from these female cultivars mature earlier in the season than 'Kerman', the industry standard, affectively lengthening the harvest season, which reduces peak demand for labor, harvesting equipment and nut processing capacity.

Nuts of 'Lost Hills', an early maturing U.C. cultivar released to the industry in 2005, emerging from the huller at a pistachio processing plant in 2012.

Winter Juvenile Pistachio Tree Dieback Continues to be a southern San Joaquin Valley Problem

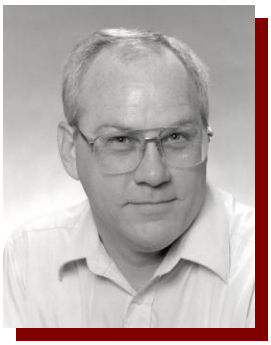
Juvenile pistachio trees appear to be in excellent health as they go into fall dormancy. Initial winter juvenile tree dieback occurs sometime in the time period between early November and spring leaf out in 1st through 7th leaf trees. The extent of the dieback varies. The worst dieback is not obvious until May, when pistachio trees begin to leaf out in the spring. In severely affected trees third-leaf or older, new growth, typically, may push only from the lower scion or rootstock and this growth occurs later than in unaffected trees. Bark samples from the trunk of injured trees show elevated levels of sodium and magnesium, perhaps indicating that the conducting tissues were damaged and leakage occurred into the bark. Affected 1st and 2nd leaf trees may die without pushing any new growth or the new growth begins to fade quickly with the first warm temperatures. Often in very young trees, the rootstock appears to die first. The problem is worst in low elevation areas of the San Joaquin Valley where soil salinity can be high.

Existing evidence from our research, albeit limited, suggests that winter dieback is caused, mainly, by freeze damage occurring in November and December. The severity of the damage, and the symptoms displayed by affected trees, appears to depend on the degree of dormancy of the tree at the time of the freeze and the duration and magnitude of the low temperature of the freeze event. Soil salinity may be a factor, but is probably related to osmotic effects of the soil on root health, plant hydration, plant winter hardening and induction of dormancy and not to toxic ion effects. Terminating irrigation at the end of August appears to provide some protection from winter dieback. Experimental trials have been established to find the causes and possible solutions to this problem, which may include development of new rootstocks.

Tree showing spring regrowth after winter damage from winter juvenile tree dieback.

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. Other areas of research are chemical weed control and nitrogen fertility across multiple crops.

Projects/Applied Research:

Remote Sensing of Corn to Determine Nitrogen Fertilizer Recommendations

The Southern San Joaquin Valley produced 9.5 million tons of corn valued at 403 million dollars from 340 thousand acres in 2011. Corn is a heavy nitrogen user. An estimated 57 thousand metric tons of nitrogen was used. While nitrogen requirements for optimum crop production are well established, the appropriate rate and timing of individual nitrogen applications are not always accurately accomplished. The nitrogen requirement can be accurately determining by knowing the available soil nitrogen and the amount of added nitrogen in conjunction with tissue tests. This method is expensive and time consuming and rarely performed. Additionally, much of the corn silage acreage is fertilized with manure and irrigated with dairy lagoon water. However, an accurate and thorough measurement of nitrogen levels in manure and lagoon water even when conducted is highly variable. The over application of nitrogen has the potential to dramatically impact ground water through leaching and surface water from runoff. The use of remote sensing to determine nitrogen status in the plant is a quick method for determining if any additional nitrogen is required to produce optimum yield and quality.

The difference in N content between plot A and B is visual with the naked eye. The N content difference between plot B and C is not. However, remote sensing can establish a difference and recommend the appropriate nitrogen fertilizer rate.

The objectives of this project were to assess the reliability of remotely sensed non-destructive plant nitrogen measurements compared to wet chemistry data from sampled plant tissue, develop in-season nitrogen recommendations based on remotely sensed data for improved nitrogen use efficiency and assess the potential for determining yield and quality from remotely sensed data.

Real time sensing of plant nitrogen status can be a useful tool in managing nitrogen inputs. Very good correlations have been observed between remotely sensed crop nitrogen status, in-season nitrogen fertilizer recommendations and yield for other locations. However, these other regions do not match the high input, irrigated, high yield potential conditions for crop production in the southern San Joaquin Valley.

Very good correlations were observed between meter reading differences from the CCM 200 and SPAD instruments and nitrogen recommendation, R^2>0.89 and 0.90, respectively. CM 1000 measurements made early in the season were not well correlated because too much bare soil was sampled in the measurement area thereby making those measurements less reliable.

Side dress nitrogen fertilizer recommendation is as follows: Apply the expected full nitrogen fertilizer rate on a reference area with actively growing plants at least three weeks prior to sampling. The reference area should be representative of the field and can be several small areas throughout the field or a strip through the field. At growth stage V8 to V10, compare the readings from the reference areas to readings from the remainder of the field. Because individual plants vary, at least 30 readings should be made throughout the field and reference area. Make the measurements at the mid-point of the leaf on the upper most leaf that has a collar exposed. The difference between the reading average will give an indication of the need for additional nitrogen fertilizer.

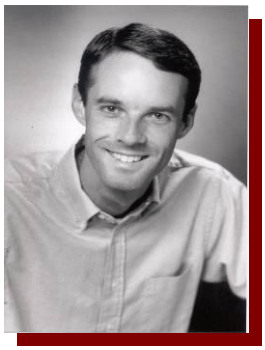
The side dress nitrogen fertilizer rate calculation is:

$$N = 27 * dSPAD + 35 \quad \text{or} \quad N = 12 * dCCM + 35$$

N = Recommended Nitrogen Rate in kg N ha^{-1}
dSPAD / dCCM = Difference in SPAD or CCM 200 meter reading between the measured crop area and the reference area.

ENTOMOLOGY AND PEST MANAGEMENT

David Haviland, Farm Advisor



Program Description:

The entomology farm advisor in Kern County is responsible for all aspects of arthropod pest management in both agricultural and urban landscapes. Primary objectives of the program are to develop and disseminate information on effective, safe, and affordable strategies to control insect and mite pests. This includes research and educational programs on topics such as biological control (fighting bugs with bugs), cultural control (modifying how crops are grown to minimize pest problems), treatment thresholds (how to decide if controls are needed), and chemical control (insecticide use).

Research by the entomologist emphasizes practices that minimize negative impacts to the environment by maximizing strategies that rely on non-chemical solutions. In cases where pesticides are needed, research and extension programs focus on how to utilize newer, reduced-risk products in a judicious manner that continues to raise the bar with regards to environmental, fieldworker, and consumer safety.

Applied Research - 2012 Highlights:

MANAGEMENT OF TREE AND VINE PESTS

Advisor Haviland has a decade of experience conducting research on insect and mite pests of trees and vines. In almond he continues to do work on the management of navel orangeworm and spider mites that has helped to improve the predictability and effectiveness of crop protection. Much of this research has been facilitated by two experimental almond research orchards that have been established by Haviland through a joint agreement with the grower-funded Almond Board of California. In grapes he has maintained an active program to help local table grape growers manage a new pest called vine mealybug that has now become entrenched in many California vineyards. New research by Haviland's lab is currently working towards refining those programs through a detailed study on the systemic movement of a chemical called spirotetramat within vine tissues. In pistachios Advisor Haviland is working to develop treatment thresholds that will provide growers with a cost-benefit model for determining the need to treat for Gill's mealybug. He also has active research projects in blueberries, cherries, and walnuts. Each project addresses critical needs of local growers with regards to integrated strategies for the control of pests.

SABBATICAL LEAVE TO LA SERENA, CHILE

Advisor Haviland spent the first half of 2012 on sabbatical leave in northern Chile. While there he worked closely with Chilean government organizations and Universities to further the adoption of reduced-risk integrated strategies for pest management. He was based at a location in northern Chile that grows similar crops and has a similar climate to what is found in the San Joaquin Valley. This allowed a beneficial relationship whereby Advisor Haviland was able to share California's experiences with management of pests of grape, citrus, and other crops while learning about Chilean experiences and solutions to similar issues.

While on sabbatical Advisor Haviland also spent significant amounts of time writing and has been able to publish several peer-reviewed scientific journal articles related to his ongoing research program in Kern County.

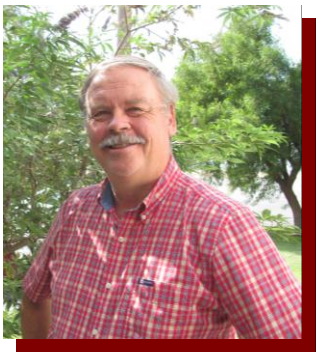
Extension and Education Programs - 2012 Highlights:

EDUCATION ON SAFE AND EFFECTIVE PEST MANAGEMENT PRACTICES

Each year the Kern County Entomologist is actively involved in extension work that ensures that growers and pest control advisors in Kern County receive the latest information on the most affordable, safest, effective methods for pest control in a variety of local crops. In 2012 Advisor Haviland and his staff gave approximately 30 presentations and authored approximately 30 publications that all related to practical aspects of pest management for California farmers, and especially those in the lower San Joaquin Valley. Advisor Haviland and his staff also participate in a variety of local events helping children, teachers, and other community members learn about pest management issues facing Kern County. This includes activities aimed at teachers, such as the Kern County Ag in the Classroom program as well as those targeting students, such as the annual Farm Day in the City event at the Fairgrounds that attracts over 1,000 elementary school children from Kern County each year.

ENVIRONMENTAL HORTICULTURE/ ENVIRONMENTAL SCIENCE

John Karlik, Advisor



HORTICULTURE FOR LANDSCAPE AND GARDEN 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.

For the first time, we held a nine-week series of classes in Tehachapi per the request of Tehachapi residents, with 63 registered.

Per our usual educational outreach, two 16-week classes for horticulture for landscapes, gardens, and orchards were held during fall, 2012. The classes were complemented by our annual pruning demonstrations, held in December.

- Horticulture I class had an enrollment of 36
- Horticulture II class had an enrollment of 21

Topics discussed included:

- Soil properties and soil modification
- Plant selection and placement
- Tree planting and staking
- Pruning of shade trees and fruit trees
- Small-scale fruit, citrus, and vegetable production
- Irrigation and water conservation
- Non-chemical pest management
- Plant selection

Impact:

Presentation of up-to-date horticultural information for Kern County. Delivery of information to reduce home pesticide use, conserve water, and enhance the urban environment.

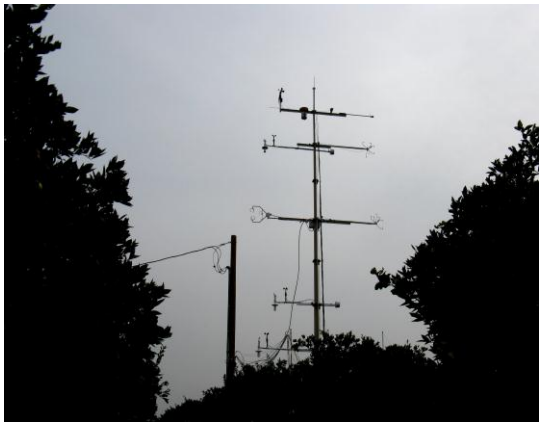
John Karlik and Mario Viveros talk after the 2012 pruning demonstration.

AGRICULTURAL CROPS AND AIR QUALITY

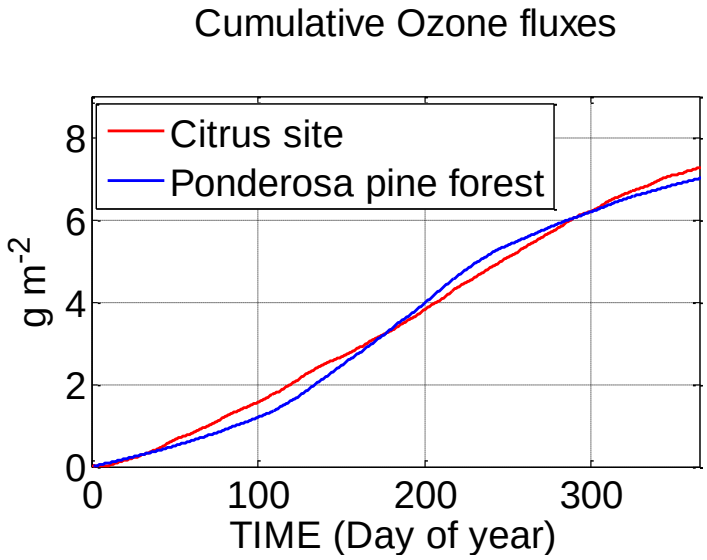
We have been engaged in two three-year projects to help us better understand the role agricultural crops play in regional air quality. We have measured ozone removal by citrus; ozone is the principal gas-phase air pollutant in the San Joaquin Valley. We also measured trace gas emissions including volatile organic compounds from agricultural crops. The field work was conducted in Tulare County about three miles west of the UC Research and Extension Center at Lindcove. We found that crops emit low amounts of isoprene, the dominant volatile organic compound emitted by plants. We also found that ozone was removed by citrus trees through three processes: stomatal uptake, surface reaction, and gas-phase chemical reactions. Ozone was removed at all times of the year, and the amount of ozone removed by oranges was about the same as removed by an equivalent acreage of Sierra forest.

Allen Goldstein, professor at UC Berkeley, and Silvano Fares, post-doctoral researcher, at a field meeting.

Allen Goldstein and Silvano Fares working on data at the citrus site.



Tower in citrus orchard with measurement instruments and inlet lines leading to analytical equipment.



Cumulative ozone deposition (grams per meter squared) at the citrus site compared to measurements made in a ponderosa pine forest near the UC Blodgett Forest Research station.

4-H Youth Development

John Borba, Advisor and Interim County Director

Program Description:

4-H is a nationally recognized positive 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 enables youth to develop into productive citizens and leaders by learning through hands-on, research-based projects with adult mentors. 4-H is open to youth 5 through 19 years of age. Kern County hosts over thirty clubs, both traditional and outreach, which reach more than one thousand youth and hundreds of volunteers. 4-H programs are available to both urban and rural youth.

Highlights:

PROMOTING BIO-SECURITY IN 4-H

Livestock exhibitors often transport their animals across county and state lines to get them to fairs and expositions. These animals can come into contact with numerous health hazards along the way. Food safety and animal identification have become major issues at the state and national level. The practices that individuals follow in transporting and housing livestock could impact a major food production source.

Northwest 4-H club members proudly pose for a group photograph after completing their report on bio-security to the Leader Council

Extension Methods:

Kern County 4-H staff has been involved with a project with the Veterinary Medicine Science Department at the University of California, Davis to create an educational program for volunteer leaders and youth regarding common practices of handling, housing, and transporting livestock. Data was collected by Kern County 4-H staff that allowed the research team to attain observations from fairs in the southern San Joaquin Valley. A pilot program was developed for teaching 4-H volunteer leaders and youth about bio-security as it relates to their animal projects.

Results/Impacts:

Kern County was selected as a pilot site for the new material. A team of 4-H volunteers and youth were recruited and trained on the material. The youth and adult volunteers involved in this project pilot tested newly developed curriculum regarding the safe and hygienic practices of handling livestock. The youth involved provided important feedback and data regarding the efficacy of the lessons. They also participated in several public presentations regarding bio-security and the importance of it to 4-H and food production.

Staff members of the Arvin and Delano afterschool programs receive hands-on instruction in implementing the 4-H Aerospace Adventures project

PROMOTING SCIENCE, ENGINEERING, AND TECHNOLOGY (SET)

4-H SET is a national movement to expand the involvement of youth in science, engineering, and technology projects. SET activities combine non-formal education with hands-on, inquiry-based learning in a positive youth development setting. One of the major goals of SET is to address the significant workforce shortage that is anticipated because of a lack of emphasis on science and math in U.S. schools in comparison with other nations.

Extension Methods:

Kern County 4-H has been involved in SET since its inception in 2008. Utilizing our venues of clubs, camps, and outreach projects, we incorporate SET activities into a number of existing 4-H programs. This year our major SET undertaking was the training of after school staff members so they could implement 4-H SET curriculum into their after school programs. The staff members involved came from after school programs of the Arvin Union School District and the Delano Union School District.

Results/Impacts:

Four hands-on workshops were held for the staff which focused on the experiential learning process. The specific SET projects that were introduced were: the Power of Wind, Aerospace Adventures, and Junk Drawer Robotics. Of the total ninety eight participants involved in the program, all indicated that they improved their knowledge of science based activities and that they would implement these projects in their after school programs.

4-H MILITARY PARTNERSHIP

The U.S. military and 4-H has a long history of cooperation and joint activities. This year we were able to continue our support of local military families by securing a grant which allowed us to provide events and activities for military families, specifically to those with a deployed parent.

Local Operation: Military Kids Coordinator Veronica Slaton, Mayor Harvey Hall, Petty Officer First Class Lacey Segrest and her son Peyton Segrest pose for a photo at the first 'Peyton's Pals' Military Fun Day' events! Lacey and Peyton were the inspiration for the formation of the local military kids support network here in Kern County.

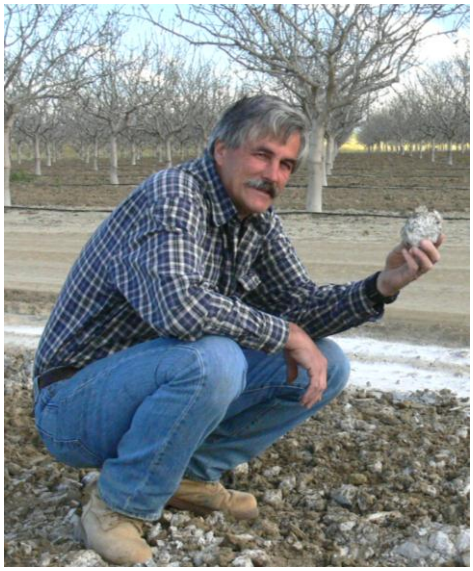
Extension Methods:

The Kern County 4-H staff worked closely with the State Operation Military Kids program staff to jointly plan four community activities for military families. Operation Military Kids is a national outreach program to the dependent youth of military personnel, particularly those of National Guard and Reserve forces who have been and who are preparing to mobilize. The 4-H staff also worked at building a network of local community partners to support these families.

Results/Impacts:

These four community events provided activities for the youth impacted by deployments and allowed them to meet with other local youth facing the same hardships related to being a military dependent. These events also served as networking and information sharing opportunities for the parents and caregivers.

Irrigation and Agronomy



Blake Sanden, Farm Advisor

General Program Summary

IRRIGATION & SOILS: Major Program Focus

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 for production of alfalfa, dry beans, sugar beets and safflower through grower consultations and field trials

IRRIGATION MANAGEMENT, MONITORING, KERN EFFICIENCY & the IRRIGATED LANDS REGULATORY PROGRAM

Situation: Water to SJV growers dropped to a 60% supply in 2012. Average water costs for Kern growers are about $120/ac-ft. with Westside supplemental canal water costing more than $300/ac-ft. Ensuring optimal water use efficiency is key to grower survival and proving beneficial use.

Methods: Nine years of UCCE Kern County field evaluation and irrigation scheduling demonstrations using various soil moisture monitoring techniques has proven dependable and cost effective for many permanent and vegetable crops. We helped growers install and understand the use of monitoring technology. Results and problems are discussed at annual Kern Irrigation Workshops.

Impacts:

- 12,600 acres, 143 fields, 35 different growers
- 14 different crops (54 almond fields), 9 different irrigation system types
- Average water use efficiency: 95%
- Confidence and understanding of these systems through UCCE Kern demos has created markets for other companies and grower use of this technology on about 100,000 acres in Kern County (my estimate).

Extension Outreach For 2012

Methods: Presentations at local, state and national meetings, field days plus individual consultation through farm and phone calls.

Impacts:

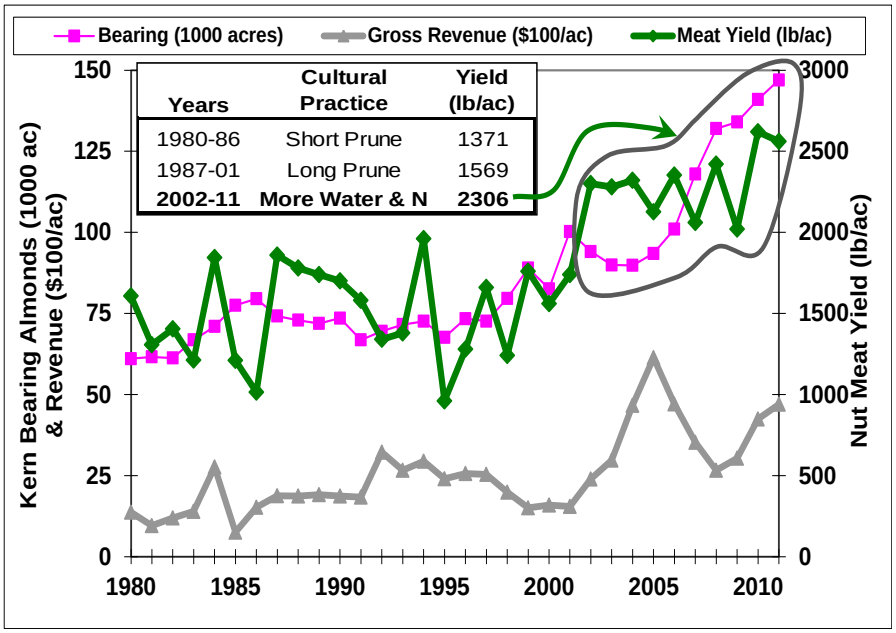
- 3 Kern County meetings/workshops
- 15 other county meetings
- 21 professional/university meetings
- 2 newsletters, 3 popular press articles
- 98 farm calls and office consultations
- 10 research projects
- 2400 people served

IMPROVING WATER/FERTILIZER MANAGEMENT AND YIELD IN ALMONDS. IMPACTS ON UPCOMING IRRIGATED LANDS REGULATORY PROGRAM:

Situation: As competition for California water increases and concerns mount over groundwater quality, growers face increasing economic and regulatory pressure to farm at levels of fertilizer and water use efficiency thought impossible even 10 years ago. Kern County growers have always prided themselves on a level of farming excellence and efficiency that is a cut above the rest of the state. New regulations on fertilizer applications will most likely be in effect by 2014. Our recently completed nutrition and irrigation study in almonds has proved up a previously unheard of nitrogen use efficiency of 85%.

Methods: This result is the culmination of many field trials involving varietal selection and later "long-pruning" techniques pioneered by our former Kern County UC Almond Farm Advisor Mario Viveros. Combined with closer tree spacings, these structural changes set the stage for earlier canopy development and increased "bearing surface" per acre. Over the last five years, in cooperation with UC Davis researchers, we have conducted Kern County trials that are the most detailed analysis of nutritional and water needs of almonds ever conducted by UC Cooperative Extension.

Impact: Maximum water use in unstressed almonds is 30% higher than previously published numbers and can equal the water consumed by an alfalfa field. But even though it takes more water for this level of irrigation scheduling, when combined with improved fertility management with adequate nitrogen, potassium and phosphorous availability yields can be more than double compared to 20 years ago. The current Kern County trials have reached nearly 5,000 lb/ac almond nut yields with a nitrogen use efficiency of 85% and water use efficiency of 95%.



LIVESTOCK AND NATURAL RESOURCES

Julie Finzel, Advisor

Program Overview:

The Livestock and Natural Resources Advisor serves Kern, Tulare, and Kings counties and is responsible for educational outreach and research in the areas of livestock, range, and natural resource management. According to CDFA statistics, Kern County has the third highest cattle inventory in the state of California, with a 2011 inventory of 30,500 head of beef cattle.

Background on Advisor:

Julie started work at the Farm and Home office on February 6th, 2012. She attended Cal Poly San Luis Obispo where she earned her B.S. in Animal Science in 2003. Julie completed an M.S. in Rangeland Ecology and Management at the University of Idaho in May of 2011.

Program Initiation:

The initiation and initial implementation of an advisory program largely involves meeting clients and determining their needs in the areas of research and information dissemination. To achieve this goal I have attended many commercial and backyard livestock owner organizations meetings. I also distributed informal questionnaires soliciting input on topics of concern and interest. Methods of outreach to distribute and share information include 2 newsletters, with a third currently being prepared, presentations and attendance at local producer meetings, 1 popular press article, and consultation through ranch visits and phone calls.

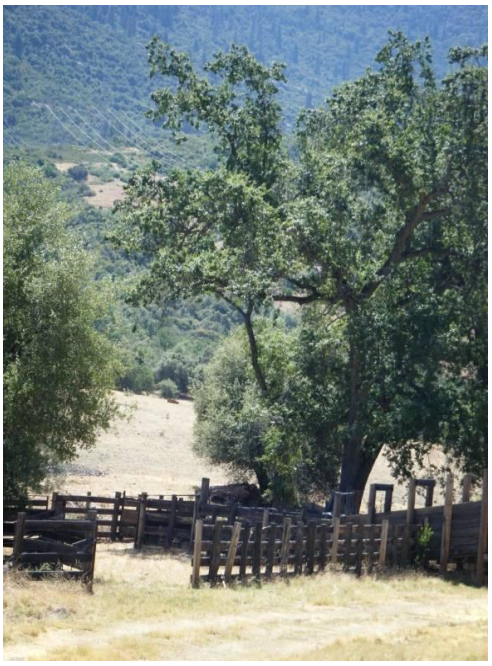
Program Highlights:

DROUGHT ASSESSMENT PROTOCOL

A drought assessment protocol is being established through cooperation with the Kern County Agricultural Commissioner, the local Farm Service Agency Staff, Natural Resources Conservation Service personnel, Bureau of Land Management personnel and local ranchers for the purpose of providing geographically relevant data regarding forage production throughout Kern County. The protocol will involve on-site visits to areas throughout the county to measure actual forage production and help provide an accurate assessment of potential drought impacts to Kern County livestock producers. The official drought designation, as determined by the Kern County Agricultural Commissioner and the local Farm Services Agency representatives is essential for ranchers to receive financial support through drought insurance programs.

FECAL PATHOGEN ASSESSMENT IN BEEF CATTLE

Through the cooperation of local ranchers, I am participating in a study that seeks to quantify fecal pathogen shedding rates in beef cattle. The pathogens being focused on for this study include: *E. Coli* (157), *Salmonella*, *Cryptosporidium* (Crypto), and *Giardia*. This is a pro-active study that seeks to mitigate potential risks to water quality before they become an issue. A species of Crypto has been identified in cattle that is specific to bovines and is considered less infectious to humans than a similar species of Crypto, *C. parvum*. Among other objectives, the study seeks to determine the rate at which beef cows and calves shed the less infectious form of Crypto versus the more infectious form of Crypto.



NUTRITION, FAMILY AND CONSUMER SCIENCE

Margaret Johns, Advisor

In November 2011, the University of California Cooperative Extension UC CalFresh (food stamp nutrition education program) collaborated with Head Start to assist the program compliance with a federal mandate to teach financial literacy to the program parents. There are 43 Head Start Centers in Kern County and about 60 Family Service Workers whose job is to connect families to resources and referrals in their communities.

Making Every Dollar Count Program is a financial literacy program designed for low-income, low-literacy participants. The program consist of 8 lessons covering the topics of goal setting, making good choices, stretching your dollar with community resources, budgeting, paying bills on time, credit, saving money on food and food advertising. It can be taught in a group setting or participants can choose the online self-paced tutorial.

Extension Methods

The Family Service workers received two, three-hour training sessions on how to teach the Making Every Dollar Count curriculum. Additional trainings were provided on the federal record keeping requirements and the evaluation tools. A follow-up meeting was conducted one month before the end of the school year to answer any questions the staff might have. A meeting was scheduled at the end of the school year to collect paper work and evaluations. For the school year beginning August 2012, another meeting was conducted in November 2012 to address any questions or concerns the staff might have. It also provided an opportunity to recognize the staff who reached the most parents with the Making Every Dollar Count curriculum.

Evaluation

A retrospective post then pre-test was administered at the last class or after participants completed the online self-paced tutorial. The evaluation tool measures changes in knowledge and behavior.

Impact

Approximately 130 parents graduated from the Making Every Dollar Count program through Head Start. The parents showed impressive gains in knowledge and behavior change. When evaluating how much the Making Every Dollar Count program has been worth to them, on a scale of 1-5, 98 percent of the participants rated the program a four or better.

Table 1: Knowledge of Make Every Dollar Count Content Areas (1=low, 5=high)
Percent (n) showing improvement

Setting personal goals (goal):	84% (110)
Understanding values (value)	78% (100)
Knowing the difference between a need and a want	74.6% (97)
How to make choices (choices)	84.2% (112)
Knowing personal skills and resources (skills)	83% (112)
Knowing community resources (resources)	89% (124)
Using resources to make your money go further (further)	88.2% (120)
Knowing easy ways to save money on food (easy)	85.8% (121)
Knowing simple, healthy meals to make at home (meals)	82% (114)
Understanding food ads	85.3% (122)

II Use of Make Every Dollar Count Skills

As a result of Make Every Dollar Count, have you:	%, n
Written a personal goal	Yes 59.4%, 76 No 9.3%, 12 Plan to 31.3%, 40
Used the choice-making steps with a decision you needed to make (decision)?	Yes 75.6%, 99 No 6.1%, 8 Plan to 18.3%, 24
Identified community resources you can use if needed	Yes 77.2%, 98 No 6.3%, 8 Plan to 16.5%, 21
Checked to see if you are eligible for Earned income tax credit	Yes 53.4%, 68 No 21.3%, 27 Plan to 25.2%, 32
Used one of the easy ways to save money on food (save)?	Yes 19.1%, 17 No 1.1%, 1 Plan to 79.8%, 71
Determined if using a coupon is better than buying a store brand (coupon)?	Yes 20.7%, 18 No 2.3%, 2 Plan to 77%, 67

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.

Root Knot Nematode of Tomatoes

Most all processing tomato varieties have genetic resistance to root knot nematode breed in to them. This has been a very effective and efficient method of root knot nematode management of processing tomatoes for over four decades. However, since 1995 this genetic resistance has been shown to be overcome by new strains of root knot nematode. Today it is not uncommon to find significant nematode injury on processing tomatoes even though they have the gene for nematode resistance.

Fumigants are commonly used as chemical methods of nematode control. However, fumigants have come under tighter restrictions and increased regulations in California due to human safety concerns, VOC emissions (which leads to smog formation), and as an ozone depleter. Also the costs of fumigants are too prohibitive for use in processing tomato production. Therefore a study was conducted in Kern County to identify other materials for nematode control.

Products tested included new chemistries and several biological products. Vydate, a registered product for tomatoes showed excellent control of nematodes when used as a pre-plant application. Two other new products that are still under development also showed excellent control. Further testing of these materials will be done in 2013.

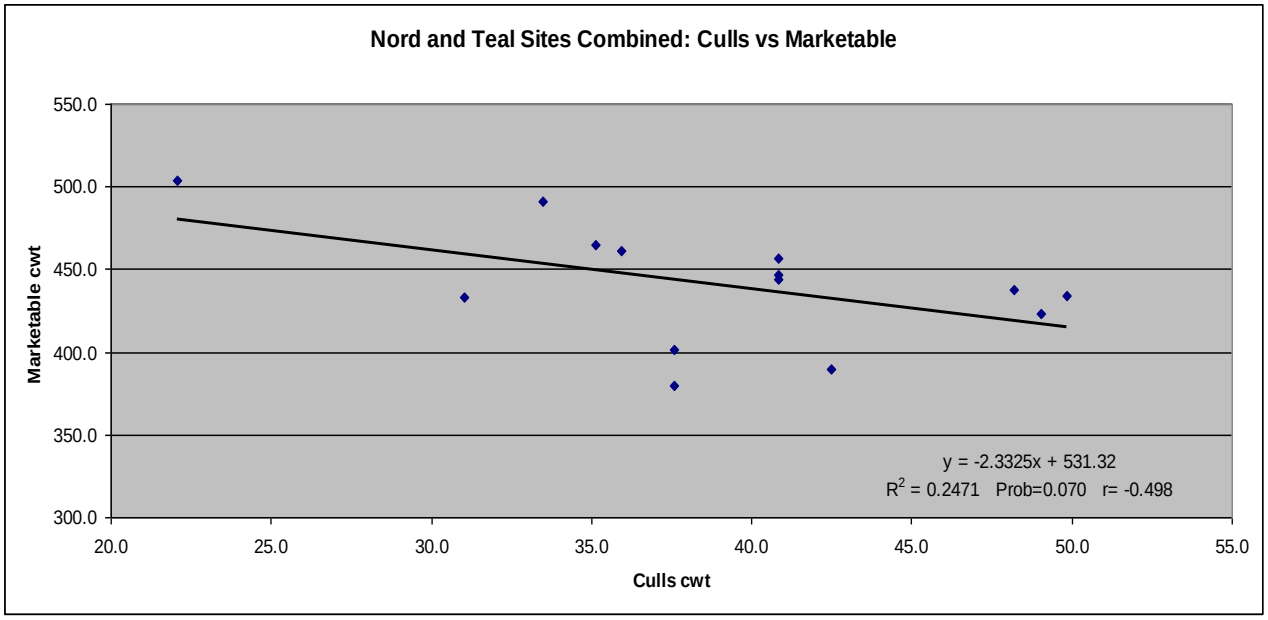
Tomato root protected by the nematicide Vydate

Tomato root with nematode injury on non-treated control

Bacterial Early Dying of Potatoes

Soft rot of potatoes has been an issue affecting all Kern County potato growers for some time now. However, field trials the past few years may have shed light on some ways to reduce the impact of this problem. This is a bacterial disease that results in potato yield and quality loss. The primary causal agent is the bacterium *Pectobacterium carotovorum.*

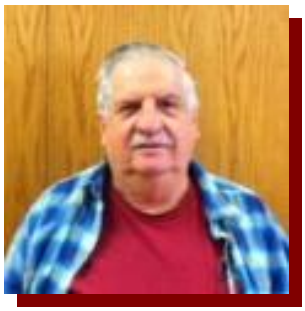
Working from previous trials conducted in Kern County, we again evaluated several promising biological materials in two field trials in Kern County. When these biological products were applied at planting they reduced the number of culls and increased the number of marketable tubers. Growers in Kern County were excited to see progress being made on this particularly difficult to manage disease.



Graph showing when culls are reduced marketable yield increases significantly.

VITICULTURE

Don Luvisi, Farm Advisor, Emeritus



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 local growers, 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 and pest management through a variety of methods such as newsletters, media, consultations and commodity meetings.

CALIFORNIA TABLE GRAPE INDUSTRY

Table grapes are of major economic importance, with the total farm gate crop value estimated at approximately $1.0 billion dollars. About 99% of the nation's commercially grown table grapes are grown in California and of the 110,000 acres grown, 40% are grown in the Delano area. California is home to 550 table grape growers, according to industry estimates, so the average table grape production operation involves over 200 acres. However, it is common for large operations to farm over 1,000 acres. Since 2000, production has ranged from 739,100 (77.8 million, 19-pound boxes) to 911,050 tons (95.9 million, 19-pound boxes) of packed grapes and of those about 30% are exported each year.

ROOTSTOCK EVALUATION OF 'SCARLET ROYAL' AND 'AUTUMN KING' TABLE GRAPES

'Scarlet Royal' and 'Autumn King' are two new table grape varieties developed by David Ramming and Ronald Tarailo of the USDA-ARS in Parlier, CA, and released to industry. Both are seedless grapes that ripen from mid-September to late October and Autumn King is a late white seedless table grape. Cultural practice work began on these varieties once they were determined to have commercial promise. Since their release, vineyard acreage has expanded in the southern San Joaquin Valley. In response to the recent overwhelming interest in 'Scarlet Royal' and 'Autumn King", our program has worked on various research projects to develop useful management guidelines for growers that result in large, high quality fruit without significantly delaying maturity or sacrificing yield and storage life. Dr. Matthew Fidelibus, Extension Viticulture Extension Specialist, has taken leadership of three rootstock trials to evaluate various rootstocks on the production of table grapes. Rootstocks are important because they can increase vigor, need fewer nutrients, and provide resistance to nematodes. These are long-term projects.

MONITORING AND CONTROL MEASURES FOR PIERCE'S DISEASE

Pierce's disease (PD) caused by the bacterium *Xylella fastidiosa*, is a killer of grapevines. Significant vine loss from PD has occurred in Southern California, North Coast and portions of the southern San Joaquin Valley including Tulare and Fresno counties over the last 100 years. However, the arrival and spread of the glassy-winged sharpshooter (GWSS), a more effective insect vector of the disease, caused devastating losses in the wine-growing regions of Temecula and threatened Kern County.

In 2001, we developed a project to track and map the progression of PD over time in selected vineyards in Kern County. The impact of the project is that it provides useful and real year-over-year information on PD epidemiology to local, state and federal agencies to demonstrate that area-wide control of GWSS does in fact reduce the spread of disease. Without this data, the effectiveness of GWSS treatment programs could be questioned and funding could be reduced or eliminated.

Recent years has seen an uptick in incidence of PD in the vineyards being tracked. Five vines in 2009 to ten vines in 2010 and 87 samples tested positive in 2011. In 2012, a significant increase in PD resulted in the 87 positive increasing to 1000's. As a result, approximately 40 acres will be removed this winter. We also trained personnel in identification of PD vines so infected vines can be removed. Vigilance has to be maintained to prevent increased losses from PD by controlling GWSS and rouging diseased vines. The increase detected is more than likely due to not rouging (removing) diseased vines in prior years.

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ORGANIZATIONAL CHART