

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

KERN COUNTY FARM AND HOME ADVISORS

2010 ANNUAL REPORT



UNIVERSITY OF CALIFORNIA
AGRICULTURE & NATURAL RESOURCES
COOPERATIVE EXTENSION KERN COUNTY



WHO WE ARE AND WHAT WE DO

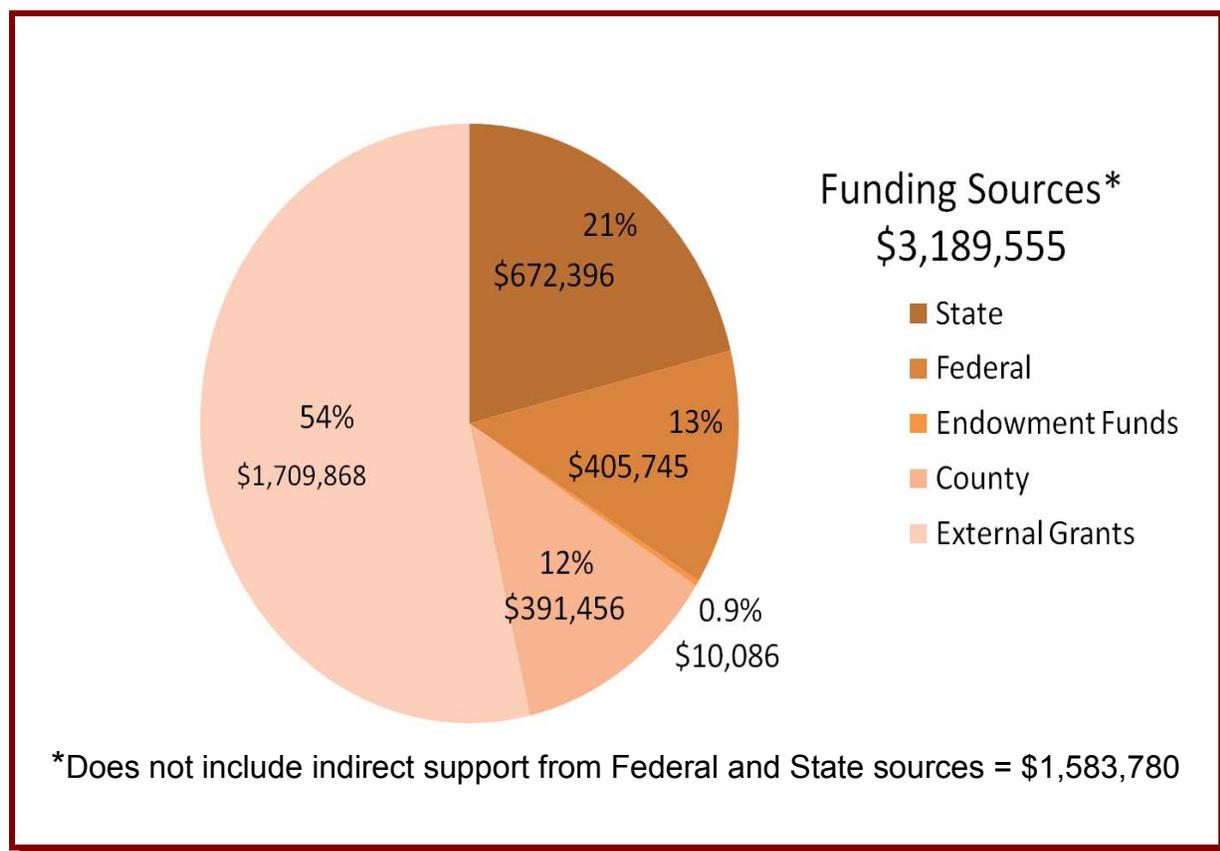
Cooperative Extension is the informal off-campus educational arm of the University of California. We are a part of the Land-Grant College System that, since 1914, has provided the citizens of California and Kern County with programs to improve their quality of living. Our informal educational programs 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, a visit to our office or our website.

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.

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.

FUNDING SOURCES



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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 60,000 acres) and pistachios (approximately 55,000 acres) primarily, as well as for miscellaneous permanent crops such as persimmons, pomegranates, olives and figs.

Projects/Applied Research:

EXPERIMENTING WITH NATURALLY-OCCURRING PLANT GROWTH REGULATORS TO INFLUENCE BLOOM TIMING IN PISTACHIO

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. However, plant characteristics that would have value to the industry do not always appear as a result of breeding efforts. Fortunately, new cultivars are not always the only answer. In some crops, naturally-occurring plant growth regulators have been used to improve development of fruit color, hasten maturity, or as is the case with citrus, to improve our ability to store citrus fruit on the tree.

In Kern County the entire pistachio crop matures within a small window of time because of the industry's dependence on a single cultivar. This situation results in insufficient harvesting equipment and nut processing capacity at harvest. Giving the grower the ability to advance or delay bloom timing and in turn harvest, through the use of plant growth regulators would be desirable. As a result of research in 2010, we were able to advance bloom timing in pistachio with plant growth regulators. In 2011, we will continue this research by applying additional plant growth regulators at different timings during the year and in different concentrations to explore their effects on flowering and bloom timing.

In warm winters, pistachio, as is the case with cherry, does not receive enough chilling hours to produce an even bloom. Plant growth regulators may be able to reduce the necessary chilling requirement in warm winters so that normal yields will still be produced. We are also exploring the use of plant growth regulators to induce earlier dormancy in pistachio in low-elevation areas of Kern County, where sudden frosts in the fall cause damage or kill vigorously-growing young pistachio trees.

WHAT'S WRONG WITH MY TREES?

The most important facet of my job is providing an interface between Kern County farmers, industry people and crop scientists located at the UC Riverside and UC Davis campuses and the USDA and UC Research Centers. Being in the middle allows me to learn from and facilitate communication between all groups. Kern County farmers bring me insight on how to do something better and crop production problems that spur additional research. In turn, crop scientists produce information that I am able to share with Kern County growers/industry people. Often these scientists come to Kern County and I help them meet with farmers and related industry people in the field or in the classroom. This synergy is the fuel that assists California farmers in being competitive internationally, as well as providing a significant contribution to the local economy.



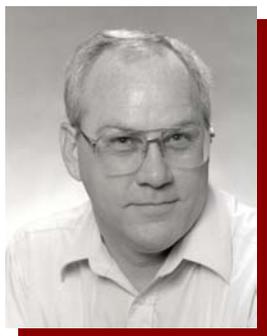
Growers and University scientists meet in a field in 2010 sharing information and possible solutions about a crop production problem affecting several orchards in the southern San Joaquin Valley.



Workers are budding experimental pistachio varieties onto rootstocks in a University of California test plot located in Kern County. This trial, established on the property of a cooperating pistachio grower in August 2010, contains both varieties originating in the Middle East and varieties that are the result of cross-breeding efforts made in Kern County and at University of California facilities near Winters, California.

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:

WEED CONTROL IN CARROT

Weed control in carrot has many challenges. Few chemicals are currently labeled for use in California. The reliance on a single herbicide increases the probability of developing weed resistance. Post planting cultivation has limited use because of multiple carrot rows on each bed. The objectives of this project were to develop management strategies for chemical pre-emerge and post-emerge weed control in carrot and to assess chemical herbicide pre-emerge and post-emerge combinations for efficacy, carrot phytotoxicity and cost effectiveness.

Averaged across all herbicide treatments, the greatest crop safety was observed in the preplant incorporated treatments. However, this treatment also had the poorest weed control in terms of efficacy and persistence. Stand establishment and weed control were not significantly different between the pre-emerge and 7 days after planting (DAP) treatments but were significantly different from the PPI treatment. The Outlook and Goal pre-emerge and 7 DAP treatments had excellent weed control, as good as the Lorox pre-emerge and 7 DAP treatments but these had unacceptable low ratings for stand establishment. The other treatments were mixed for crop safety and acceptable weed control.



Untreated Check



DCPA 7 DAP treatment

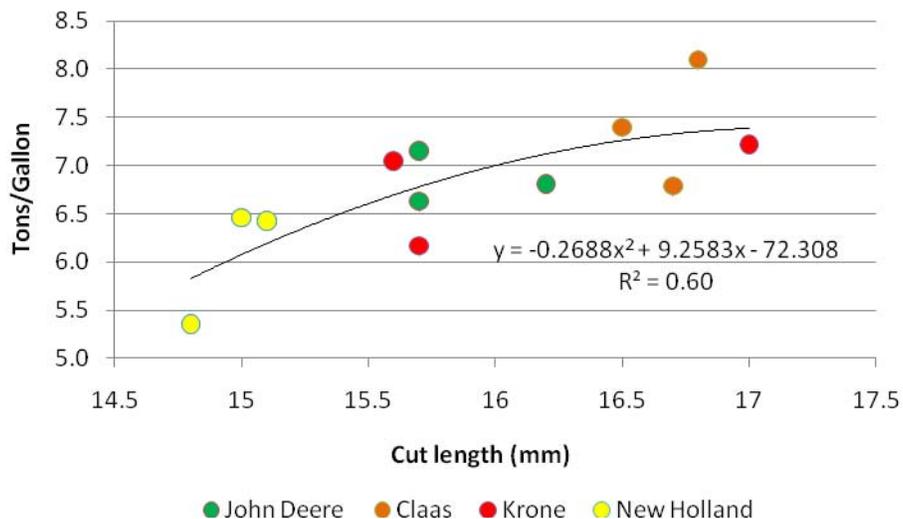


CHOPPER CHALLENGE

Forage harvester efficiency is one of the factors to be considered in obtaining a unit. Harvester capacity needs to be matched with capacity of vehicles needed for transporting the material. Other considerations are cost, reliability, maintenance and repair costs, dealer support and ease of operation. Four self-propelled forage harvesters were tested for throughput, fuel consumption and quality of processing.

Cut length had a significant impact on throughput and fuel consumption. The figure below shows the relationship of cut length versus throughput and fuel consumption as tons harvested (fresh weight) per gallon

of fuel. Increasing cut length from 15 to 17 mm increases fuel efficiency 22 percent measured as tons of silage harvested per gallon of fuel used and a 19 percent increase in capacity, tons per hour. This has a significant impact on potential emissions into the atmosphere.

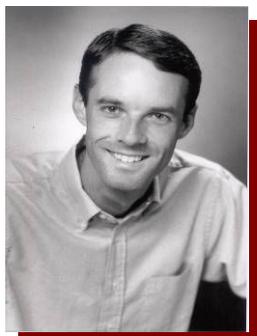


Starch in large particles (>4.75mm) is considered to have less nutritional value. The percent of total starch passing through the 4.75 mm screen is optimum above 70% and acceptable above 50%. Anything below 50% would indicate inadequate processing. Total starch percentage on unshaken samples was equivalent. The percentage of starch that passed through the 4.75 mm sieve was higher for the Claas and New Holland machines, which was the same pattern as size fraction percentage.

Disclaimer: Discussion of research findings necessitates using trade names. This does not constitute product endorsement, nor does it suggest products not listed would not be suitable for use. Some research results included involve use of chemicals which are not currently registered for use, or may involve use which would be considered out of label. These results are reported but are not a recommendation from the University of California for use. Consult the label and use it as the basis of all recommendations.

ENTOMOLOGY AND PEST MANAGEMENT

David Haviland, Farm Advisor



Program Description:

The Kern County Entomology Advisor is responsible for programs that develop and disseminate information on pest management in the southern San Joaquin Valley. These programs focus on the development of integrated pest management (IPM) strategies that are safe, effective and economically practical. They emphasize practices that minimize negative impacts to the environment by maximizing strategies that rely on cultural practices and biological control organisms. In cases where pesticides are needed, research and extension programs focus on how to utilize newer, reduced-risk products in a judicious manner as alternatives to the more toxic organophosphate, carbamate and pyrethroid insecticides that dominated during the past few decades.

The Kern County Entomologist has the responsibility of being knowledgeable on issues related to insect pest management on all commodities grown in Kern County. He uses this knowledge to advise growers and pest control advisors on the best management strategies available. Where information is incomplete or lacking he coordinates research programs to generate pertinent information, such as for newly introduced exotic pests, on appropriate management strategies.

Applied Research - 2010 Highlights:

PROTECTION OF THE KERN COUNTY CHERRY INDUSTRY FROM THE NEWLY INVASIVE SPOTTED WING DROSOPHILA

Spotted wing drosophila is a significant new pest of cherries that was first found in Kern County during February 2010. It is a similar pest to the fruit flies commonly found on overripe fruit, except that, unlike their cousins on kitchen countertops, these flies have the ability to attack fruit in the field before it is ripe. This is of major concern to the Kern County cherry industry who cannot afford to dedicate their efforts towards producing high-quality cherries for high-value export markets, only to have them infested with maggots.

Due to the threat of spotted wing drosophila we established a trapping and monitoring program that provided an early detection system for local growers. Initially, traps helped identify where flies were present and in what populations. As the season progressed, data helped elucidate information on how this pest moves among crops, on how it is impacted in different seasons by local climate, and on which local crops are at greatest risk. The trapping program was coupled with research on how crop developmental stage affects susceptibility to attack, on how to optimize trapping and monitoring programs, and on the relative effectiveness of reduced-risk and other insecticide-based control programs. These data have been presented to Kern County cherry growers at meetings sponsored by UC Cooperative Extension and have made significant impacts in helping growers know how to successfully prevent damage from this pest.



MANAGEMENT OF TREE AND VINE PESTS

Advisor Haviland has developed a robust research and agricultural community. During 2010, much of this research focused on the development of improved methods for controlling vine mealybug in grapes, navel orangeworm in almonds and pistachios, spider mites in almonds, grubs in blueberries, and leafminer in citrus. In each case this research program focuses on identifying weaknesses in pest biology or behavior that can be exploited through one or more pest management practices.



As an example, for the past several years Advisor Haviland has done work to develop improved methods for managing spider mites in almonds. Initial research focused on identifying new, reduced-risk miticides that are effective against spider mites. This work focused on identifying unique characteristics about how each product works and matching that with recommendations for field use that would allow the products to be as effective as possible. In 2009 and 2010 research and demonstration plots encompassing over 30,000 trees in Kern County were used to show growers how the newly-developed programs could be implemented on field scale. This research has helped growers implement reduced-risk management programs that are consistently effective and affordable while at the same time transitioning away from older miticides that have greater concern for human health and safety.

Extension and Education Programs - 2010 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 2010, Advisor Haviland gave approximately 40 presentations at meetings attended by members of the agricultural community and wrote approximately 30 publications. He was also involved in a variety of local events helping children, teachers, and other community members learn about pest management issues facing Kern's agricultural community as well as learn about safe and effective pest management practices for use around their own homes and gardens.

ENVIRONMENTAL HORTICULTURE/ENVIRONMENTAL SCIENCE

John Karlik, Advisor

MASTER GARDENER CLASSES



The climate and relative affordability of housing in Kern County allow individuals to practice horticulture at home, to improve the environment, improve aesthetic qualities of their neighborhood, and produce food at home. A large commercial landscape industry also exists.

Two 16-week Master Gardener classes were held during fall, 2010, and were complemented by our annual pruning demonstrations held in December.

- Master Gardener I class with an enrollment of 61
- Master Gardener II class with an enrollment of 19

Topics discussed included:

- Soil properties and their modification
- Plant selection and placement
- Tree planting and staking
- Pruning practices
- 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, conserves water, and enhance the urban environment.



Clientele learn from pruning demonstration taught by John Karlik and Mario Viveros.



Mario Viveros, Farm Advisor, Emeritus, demonstrates deciduous tree pruning for clientele.

AIR QUALITY RESEARCH: CALNEX STUDY

A careful understanding of the science is necessary to form effective air quality attainment policy.

CALNEX was a multi-investigator research project running mid-May through June. The UC Cooperative Extension office in Bakersfield was home to a supersite, where more than ten research groups and forty personnel from across the U.S. collaborated.

The universities participating included CalTech, UC Berkeley, UC San Diego, Penn State, U Toronto, and Princeton. The scientific goals include understanding the origins of pollutants and greenhouse gases, and the transport, reactions, and eventual fates of those particles and gases. The California Air Resources Board has provided major funding for the study.

The ground-based measurements were supplemented by measurements made via overflights of an Orion P-3 and Twin Otter aircraft of NOAA's Earth System Research Laboratory Chemical Sciences Division. Additional measurements were made from the research ship *Atlantis*.



The tower on which was located numerous sampling lines, weather sensors and some analytical instruments.

The data included:

- Full meteorological data including O_3 , RH, temperature, wind speed, wind direction, photosynthetically active radiation
- VOC of many sorts
- Ozone and rate of ozone production
- NO , NO_2 , total peroxy nitrates, total $RONO_2$, HNO_3 , HONO
- The critically important radicals OH, HO_2 , and total OH reactivity
- Carbon monoxide
- Greenhouse gases N_2O , CH_4 , CO_2 , isotopes of CO_2 and H_2O
- Ammonia and ammonia flux
- Aerosol chemical composition, organic functional groups and trace elements in fine aerosol (4-6 h filter samples), hourly organic aerosol speciation

The first public descriptions of results were presented at the American Geophysical Union national meeting held in December. A symposium sponsored by the Air Resources Board is planned for spring, 2011.



Doug and Shang, UC San Diego, prepare their aerosol particle mass spectrometer.



Abhinav of UC Berkeley is shown working on equipment.

4-H YOUTH DEVELOPMENT

John Borba, Advisor and Interim County Director



Program Description:

4-H is a nationwide positive youth development organization that empowers young people to reach their full potential. 4-H enables youth to emerge as leaders by learning through hands-on, research-based projects with adult mentors, in order to give back to their local communities. In California, the program is administered by the University of California Cooperative Extension. 4-H is open to youth 5 through 19 years of age. Kern County hosts nearly forty clubs, both traditional and outreach, which serve more than one thousand members and hundreds of volunteers. 4-H programs are available to both urban and rural youth.

Highlights:

4-H OUTREACH PROGRAM

Having a child participate in an organized activity such as sports leagues, recreation programs, etc. is not an option for all families. Lack of transportation, distant locations, high costs, and minimal parental involvement are factors that can deny youth the opportunity to become active in a program that will benefit their growth and development. The 4-H Outreach Program is provided as an educational extension project through the Kern County 4-H program to low-income youth and families in under-represented communities.

Extension Methods:

A 4-H Program Representative implements the program by visiting apartment complexes, community centers, and housing authorities and engaging the youth in hands-on learning projects that teach as well as entertain.

Results/Impacts:

Hundreds of youth participated in the program with the majority coming from low income families. The highlights of this year's program for the participants were a summer camp, a winter camp, and a soap box derby. At the summer camp these urban youth participated in a traditional resident camp setting with all the amenities such as horse back riding, archery, and crafts. At winter camp, the youth from the outreach program participated in activities such as sledding, games, and science projects. Youth who helped construct soap box derby cars raced them in a contest at a youth festival set up especially for them. Most importantly, teen leaders from the program had the opportunity to attend 4-H leadership conferences at the regional and state levels.

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. At our winter camp we incorporated a fire science program and an engineering activity. We hosted a statewide “Power of Wind” training that taught teen leaders and adult volunteers about renewable energy. And, because of our commitment to SET, Kern County was selected to pilot test and train a team of teens in the new Robotics curriculum. These teens were selected from throughout the state to present workshops and serve on the panel discussion at the 2010 International Society of Technology in Education Conference in Denver, Colorado.



4-H members prepare to test one of their robotic designs.



4-H members taking part in the fire science program.

Results/Impacts:

Nearly two hundred youth and adults participated in these SET activities which expanded their knowledge in the various areas of science, engineering, and technology. Kern County 4-H staff developed two SET curriculum pieces that will be used statewide to promote engineering in 4-H.

4-H/MILITARY PARTNERSHIP

The U.S. military and 4-H has a long history of cooperation and joint activities. California has the largest number of military youth in the nation. Many of these youth are affected by the deployment cycle of a family member. Building local support networks to meet the needs of children, who are geographically dispersed throughout the state, is the principle mission of our local and state Operation: Military Kids program.

Extension Methods:

UC staff, operating from Kern County Extension Office, educates the public about the needs of military youth and recruit volunteers to lead youth focused activities in Kern County and throughout the state. We also recruit community partners to promote activities and events for dependent military youth. We also work closely with Edwards Air Force Base (EAFB) to support their on-base 4-H programs and activities.



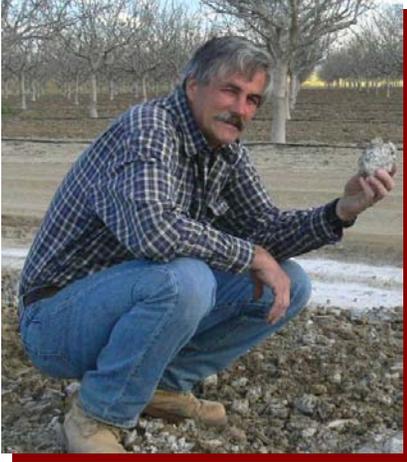
4-H members prepare to welcome returning troops

Results/Impacts:

4-H military community partners and collaborators worked extensively to implement programs and activities for Kern County military families. These include Hero Pack deployment kits and supplies for military youth, welcome home rallies and events for returning troops and veterans, and continued support for Edwards Air Force Base (EAFB) by securing a grant which allowed us to provide additional training to their staff in implementing 4-H programs on base.

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 AND KERN EFFICIENCY (2010 update)

Situation: Water allocations to San Joaquin Valley growers were a little better in 2010, but continue to be reduced by as much as 50% compared to 10 years ago. Average water cost for Kern growers is near \$100/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 have developed dependable and cost-effective water conservation strategies 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.

Extension Outreach For 2010

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

Results:

- 3 Kern County meetings/workshops
- 13 other county meetings
- 20 professional/university meetings
- 3 newsletters, 4 popular press article
- 75 farm calls and office consultations
- 13 research projects
- 2000 people served



Results:

- Application to 12,600 acres, 143 fields, 35 different growers
- 14 different crops (54 almond fields), 9 different irrigation system types

Impacts:

- Average water use efficiency: 95%
- Confidence and understanding of these systems through UCCE Kern County demonstrations has created markets for other companies and grower use of this technology on an estimated 100,000 acres in Kern County.

PISTACHIO SALT TOLERANCE, PROFITABILITY AND BENEFIT TO KERN:



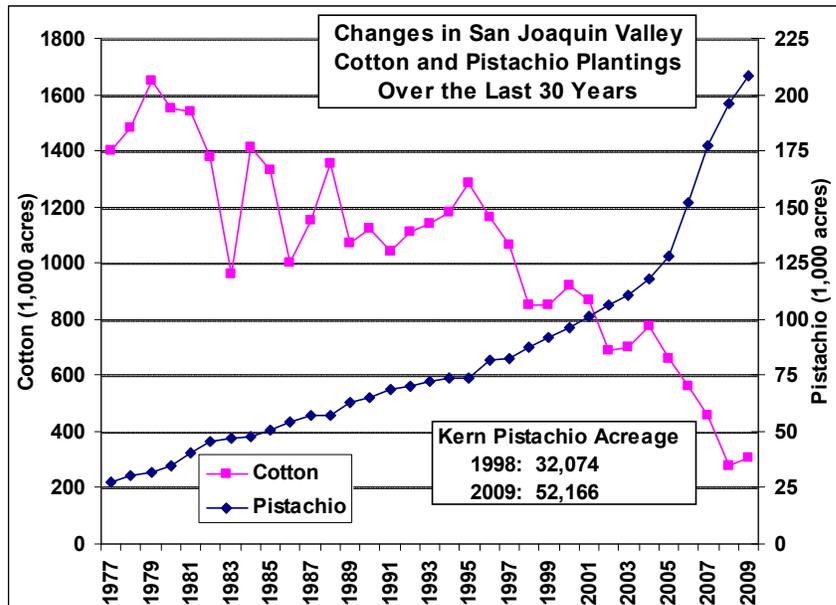
Salt damage to the margarines of pistachio leaves at the end of the season after an excellent crop of 6,000 lbs nuts/acre.

Situation: Declining profitability of cotton due to stagnant commodity prices and increasing water/input costs sent growers looking for alternatives. Pistachios are known to grow in saline soils in the Middle East, but yield poorly compared to California standards. Proof of salt tolerance while maintaining high yields was needed for California pistachio growers.

Methods: In 1994, we started a nine-year field trial with small plots in trees that were already four years old. By 2002, this trial indicated that pistachios are as salt tolerant as cotton, tolerating levels of salinity in irrigation water up to eight times what almonds will take. But the impact of this saline water on growing

a new orchard from the start was unproven. In 2005 we began the largest tree salt tolerance trial ever planted in California covering about 240 acres. 2012 will be the first yield year. Data after six years indicates that a new orchard may be slightly more sensitive to salt than cotton. Tree leaves often exhibit salt burn, but trees still produce very profitable yields.

Impact: We have worked extensively on salinity impacts and mitigation in pistachios in the San Joaquin Valley and review soil and water analyses for several thousand acres annually. More than 20,000 acres of pistachios in Kern County alone have been planted to acreage previously considered unusable for tree crops. Using conservative estimates, the increase in assessed land value from cotton to pistachios could reach \$6,000/acre. Eventual conversion of this marginal cotton acreage will likely exceed 100,000 acres in the San Joaquin Valley.



NUTRITION, FAMILY AND CONSUMER SCIENCE

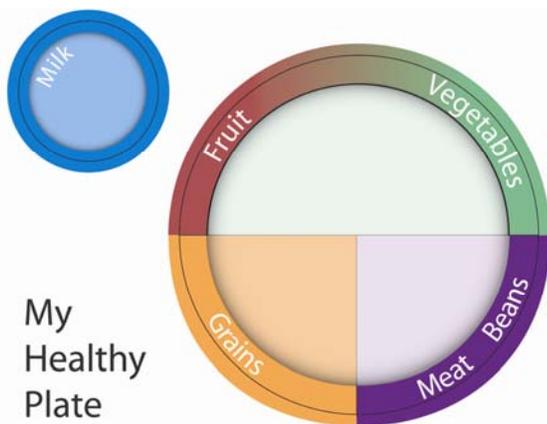
Margaret Johns, Advisor



THE CALIFORNIA PLATE METHOD AND CHILDHOOD OBESITY PREVENTION

Childhood obesity in the U.S. has increased by 300% in the last 25 years. It is common knowledge that obesity is associated with an increase in chronic diseases such as diabetes, certain cancers and heart disease. To encourage family nutrition behaviors which will protect against overweight in children, parents need to be effectively educated about what to do and how to do it. Research has shown helping children maintain a healthy weight is far more effective and efficient than treating them once they have become overweight, and eating plenty of fruits and vegetables is an important element of maintaining a healthy weight. One of the most difficult concepts in nutrition education is in explaining serving sizes and participants in nutrition classes often find it difficult to measure serving sizes.

Several years ago, Nutrition Specialists and NFCS advisors, collaborating with the California Expanded Food and Nutrition Education Program (EFNEP), UC Food Stamp Nutrition Education Program (FSNEP), and the Center of Weight and Health at UC Berkeley, developed a graphic visual to teach families how to eat healthy. Advisors identified the Plate Method, previously used primarily in diabetes control education, as a potentially effective way of enhancing the EFNEP/FSNEP nutrition education curriculum. The method uses a simple graphic of a dinner plate with portions of different foods placed on it to help promote a variety of foods and appropriate portions of different foods. Advisors developed the California Plate intervention curriculum that included posters, hand outs, a puzzle magnet, and activities to reinforce nutrition messages, helping participants understand the importance of increasing consumption of fruits and vegetables by trying to have half of their plate full of fruits and vegetables at each meal. The intervention was moderately successful. After the initial study, the team determined rather than using the plate graphic, pictures of plates that contained real food would make it easier for people to understand the concepts of variety and portions.



Original Plate Graphic

The second phase of the project began with reviewing food recalls from participants in the EFNEP program to determine favorite foods. Three groups of food were identified: mainstream American food, African- American favorites and Latino favorite foods. Asian participants in the nutrition programs were not included since many eat from bowls, not plates. Amateur photos were taken and pilot tested to see how people reacted to the photos and what changes they would make. Pilot testing was done with low-income African Americans, Latinos and Caucasians. Adjustment was made to the plates and professional photos were taken of the plates. Pictures of plates appropriate for four year olds were also taken. Many parents over feed their children at a young age which leads to a life of over eating. These plate photos will be used in a larger study aimed at teaching parents of preschoolers how much to feed their children as well as how much they should be eating.

Extension Methods:

The original plate graphic with accompanying California Plate curriculum was pilot tested with both the EFNEP and FSNEP nutrition education programs. The pilot testing was moderately successful due to the recipes used to reinforce the nutrition messages of “make half your plate fruits and vegetables”. Three of the five recipes contained fruit which resulted in an increase in fruit consumption. Vegetable consumption did not improve in the initial study. The next phase of this project will consist of actual pictures of food on plates that reinforce the following nutrition messages: make half your plate fruits and vegetables, eat more whole grains and eat less protein. These pictures will be used in an educational intervention with parents of pre-school children. Child size plates with appropriate portions will also be used to educate the parents. The California Plate is based on a 10” plate for adults and a 7” plate for children. The plates will also contain nutrition messages that reinforce the images on the plate.

Impact:

Since the second phase of the project is still in the development stages, impact date is unavailable. The initial testing of the plates with real food has generated excitement with those agencies that assisted us with the pilot testing.



7” Child’s Plate



10” Adult’s Plate

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.

SOUTHERN BLIGHT OF TOMATOES

In the 2010 tomato season several fields in the Southern San Joaquin Valley were severely infected with Southern blight. There were also reports of Southern blight infecting fields in the northern tomato growing region of the San Joaquin Valley as well. Lightly infested fields will often go unnoticed because the infections are limited to a few plants scattered throughout a field. However, in the following years as the inoculum levels in the soil increase the amount of infected plants will increase until large areas of the field are obviously infected. Within a season or two, Southern blight can be serious enough to cause entire loss of fields.

A small trial was conducted in 2009-2010 in a tomato field infested with Southern blight. Fungicides and bio-pesticides were applied in a trial to find a method of managing this serious disease of tomatoes. In this initial trial the disease was not suppressed by any of the products tested. One fungicide provided some early season control but by the end of the season it showed no reduction in disease compared to the control. A larger trial will be conducted in 2011 with funding from the California tomato processing industry.



Southern blight of tomato.

USE OF MULCHES TO CONTROL VIRUSES OF PEPPERS

A study investigating ways to repel aphids and thrips from pepper plants to prevent virus infection has been on going since 2008 in Kern County. The trial was been conducted each year in a grower's field in an area that often has cucumber mosaic virus (CMV) of peppers.

In some parts of the country silver reflective mulch has been used as a method to repel aphids and thrips from various crops to prevent virus transmission. It is often used on tomatoes, melons, and peppers to prevent virus infection such as tomato spotted wilt virus (TSWV), tobacco mosaic virus (TMV), CMV and others. Other colored plastic mulches have been shown to increase plant size and yield. Probably the main use of plastic mulch on vegetables however is for weed control. Black colored plastic mulch does an excellent job of shading the soil surface thus preventing weed growth. Sometimes clear plastic mulch is used to warm the bed for early season planting in the spring.

The main objective of this study was to determine which plastic mulches besides silver reflective mulch could repel aphids and thrips to prevent virus transmission. Another objective was to determine if a more cost-effective spray on mulch could be used to repel aphids and thrips. Lastly, to determine what effect these different mulches have on plant growth and yield.

After three years of field research we have shown that all of the mulches have the ability to repel aphids and most can also be used to repel thrips. The spray on white mulch does as good of a job repelling aphids as the more costly and labor intensive plastic mulch and also does a good job of repelling thrips. The red and green plastic mulch had the added benefit of increase plant vigor, growth and crop yield as well.



White plastic mulch and spray on biodegradable mulch.



Examples of colored plastic mulches used in trial.

VITICULTURE

Jennifer Hashim, Farm Advisor

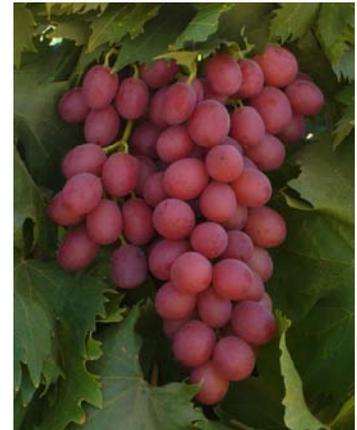
Program Description:



The Viticulture Farm Advisor provides a broad based, off-campus education and research program in the fields of viticulture (with an emphasis on table and wine grapes), small fruits production, post-harvest handling and pest/pathogen management for 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.



OF CULTURAL PRACTICES ON 'SCARLET ROYAL' AND 'SWEET SCARLET' TABLE GRAPES



'Scarlet Royal' and 'Sweet Scarlet', developed by David Ramming and Ronald Tarailo of the USDA-ARS in Parlier, CA, are two of the most recent table grape varieties released to industry. Both are red seedless grapes that ripen at similar times, mid-August to mid-September, but they are vastly different in terms of appearance and taste. 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 'Sweet Scarlet', 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.

6TH INTERNATIONAL TABLE GRAPE SYMPOSIUM AND TECHNICAL TOUR

Our program co-chaired and handled logistics for the 6th International Table Grape Symposium which was held at University of California, Davis from June 24 – 26, 2010. The program included keynote presentations, oral presentations and posters focused on table grape production topics and was followed by a technical tour of research facilities and producers in California's San Joaquin Valley. The meeting takes place every 4 years and is hosted by major table grape growing countries. We were proud to highlight California's contribution to research and production issues. The symposium was attended by 283 participants from 16 different countries.



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.

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ORGANIZATIONAL CHART

