

University of California Cooperative Extension Santa Barbara

Quarterly Report July—September 2018



UC CalFresh Nutrition Educators training adults and youth at low-income housing in Orcutt how to build and maintain community gardens to increase residents' health and wellness outcomes

Submitted by: Katherine E. Soule, PhD
Director of UC Cooperative Extension
Santa Barbara County
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UC Cooperative Extension Programs in Santa Barbara County

PLANT SCIENCES AND HORTICULTURE led by Mr. Mark Battany, Dr. Surendra Dara, Dr. Ben Faber, and Dr. Chris Greer specializes in the science and art of growing fruits, vegetables, flowers, and ornamental plants. Advisors conduct local field research to test new crops and varieties that are best adapted to local soil and water conditions and markets, implement improvements in cultural practices and pest control methods, and offer information that optimizes production, conserves natural resources, and protects the environment. Advisors are called upon regularly by growers and the general public to assist in enterprise planning and problem solving. Programs include the UC Integrated Pest Management and UC Master Gardener programs.

YOUTH, FAMILIES, AND COMMUNITIES PROGRAMS led by Dr. Katherine Soule and Ms. Liliana Vega. The mission of the UC Youth, Families, and Communities Program in Santa Barbara County is to cultivate environments where local youth, families, and community members have access to science-based resources and knowledge in order to be the creators of a healthy, inspired, active, & connected Central Coast. Programs include: the UC CalFresh Nutrition Education, UC Master Food Preservers, and 4-H Youth Development programs.

NATURAL RESOURCES, RANGE MANAGEMENT, WATERSHED, AND LIVESTOCK led by Dr. Royce Larsen and Mr. Matthew Shapero, provides range and pasture livestock ranchers and producers with research-based information on ecosystem services, irrigated pastures, resource economies, livestock health, production and management, improvements, and watershed management and water quality issues on rangelands.

FIRE ECOLOGY AND MANAGEMENT led by Dr. Max Moritz, focuses broadly on scientific questions in fire ecology and management. Research includes analysis of where various fuel management techniques are likely to succeed and be sustainable, mapping of fire weather patterns, and quantifying linkages between fire and climate change. Outreach efforts emphasize fire-related policy decisions and education of the general public to live more safely on fire-prone landscapes.

UC Cooperative Extension Advisors and Specialists in Santa Barbara County



Royce Larsen, Ph.D.
805-434-4106
relarsen@ucanr.edu



Max Moritz, Ph.D.
805-893-2125
mmoritz@ucanr.edu



Chris Greer, Ph.D.
805-781-5161
cagreer@ucanr.edu



Surendra Dara, Ph.D.
805-788-2321
skdara@ucanr.edu



Katherine Soule, Ph.D.
805-781-5940
kesoule@ucanr.edu



Liliana Vega, M.S.
805-781-4188
live@ucanr.edu



Ben Faber, Ph.D.
805-645-1462
bafaber@ucanr.edu



Matthew Shapero, M.S.
805-645-1475
mwshapero@ucanr.edu



Mark Battany, M.S.
805-781-5948
mcbattany@ucanr.edu



Hiromi Peck
Publication Formatting



Dayna Ravalin
Technical Editing



Jerry Harris
Office Manager

Administrative Accomplishments—Director, Dr. Katherine E. Soule

The Challenge

Communities beyond the reach of the land grant campuses of the University of California present special challenges for outreach and extension. Cooperative Extension is the public education arm of the University of California's Division of Agriculture and Natural Resources. Cooperative Extension provides a direct link between all citizens of Santa Barbara County and the research, teaching and public service activities of the University.

Our mission is to extend research knowledge and information to empower people to improve and enhance their lives. We represent a unique partnership between the University of California, the County of Santa Barbara, and the United States Department of Agriculture.

Addressing the Challenge

As Director of Cooperative Extension in Santa Barbara County, Dr. Katherine E. Soule maintained contact with the Agricultural Commissioner throughout the quarter. On July 10th, Ms. Liliana Vega joined the UCCE team in Santa Barbara County as the 4-H Youth Development Advisor. In August, our unit launched new [Breastfeeding and Family Friendly Workplace Guidance](#), including mobile lactation support for educators working remotely.

UC academics collaborated with the Santa Barbara County Cattleman's Association, Santa Barbara County Fire, Vandenberg Air Force Base, Santa Maria Bonita School District, THRIVE Santa Maria's Healthy School Pantry, Santa Barbara County Public Health Department, Lockheed Martin, United Way, local libraries, Carpinteria Garden Park, the Santa Barbara Botanic Garden, local farmer's markets, City of Santa Maria Parks and Recreation, Santa Barbara County Fire Safe Council, Cachuma Resource Conservation District, Santa Barbara County Public Works, California Avocado Commission, US Forest Service, UC Santa Barbara, UC Riverside, and the USDA to support educational programs and research.

Livestock and Range Advisor Matthew Shapero served on the Santa Barbara Agricultural Preserve Advisory Committee during Dr. Larsen's 2018 sabbatical leave, attending 2 meetings during this period.

Santa Barbara County Agricultural Advisory Committee meetings in July, August, September were attended by Dr. Faber, Advisor Shapero, and Dr. Moritz. Updates were provided on UCCE activities and upcoming events.



New lactation room and supplies for UCCE team members working in Santa Barbara and San Luis Obispo Counties

Public Value

The University of California Cooperative Extension programs in Santa Barbara County:

- Ensure that science-based information developed by the University of California is available to all the people of Santa Barbara County through outreach and education provided by UCCE programs.
- Narrow the gaps in information needed by county agencies and constituents to inform policy and decision-making through local research into questions and issues unique to Santa Barbara County.
- Bring together the resources and expertise of the University of California and local partners to develop solutions to local problems.
- Provide research and information to local partners on practices or programs that reduce costs or increase benefits for the people and environment of Santa Barbara County.

Area Cooperative Extension—Advisor Dr. Christopher Greer

The Challenge

Growers of agricultural crops throughout California face ever increasing challenges related to pest management through the introduction of invasive pest species, increased production costs, changing federal and state laws and regulations, and consumer preferences. Ecosystem-based strategies for agricultural pest management that are developed and validated through local field research and evaluation, disseminated through effective educational opportunities, and adopted on a regional or areawide scale are essential to maintaining economic viability of agricultural crops. Integrated pest management is a decision-making strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and nontarget organisms, and the environment.

Addressing the Challenge

During the quarter, Advisor Dr. Chris Greer committed to establishing the groundwork for his integrated pest management program with an emphasis on plant pathology. Initial efforts have focused on better understanding local needs and have included:

- Initiating informal and formal integrated pest management needs assessments to determine and prioritize critical clientele and agricultural industry pest management issues. Informal assessment included farm calls and discussions with farmers, pest control advisors and other agricultural professionals.
- Prepared for testing for a Remote Pilot Airman Certificate with a Small Unmanned Aircraft System Rating to legally operate a drone for aerial imaging in support of pest and disease monitoring research.
- Co-organized a one-day workshop “Pest Management in the Garden/Landscape” in both English and Spanish, to provide pesticide safety and integrated pest management training to maintenance gardeners and allowing them to earn the credits needed to renew their maintenance gardener qualified applicator certificate.
- Served as an appointed member of the California Department of Food and Agriculture California Invasive Species Advisory Committee.
- Serving as a member of Allan Hancock College Agricultural Advisory Committee.



Pierce's disease symptoms on the foliage of a red grape variety. Credit: UC Statewide IPM Program - Jack Kelly Clark

Public Value

In Santa Barbara County, the University of California Integrated Pest Management Program helps residents, growers, land managers, community leaders, and professional pest managers prevent and solve pest problems with the least unintended impacts on people and their surroundings, which can lead to:

- Increased ecological sustainability of agriculture, contributing to improving air, soil, and water quality while ensuring the viability of the agricultural industry.
- Improved food security, leading to increased access to abundant, affordable, safe, and healthy food.
- Increased agricultural efficiency and profitability, improving yield, as well as reducing inputs, thus increasing economic return.

Watershed, Natural Resources, and Rangeland Management—Advisor Dr. Royce Larsen

The Challenge

There are close to one million acres of native pasture and forestlands in Santa Barbara County, which are collectively referred to as rangelands. Comprising approximately half of the acreage of the County, these lands provide opportunity for multiple purposes. Rangelands serve as watersheds to capture, store, and release water for downstream uses; they provide forage for grazing by livestock; and their diverse plant communities provide habitat for many species of wildlife and recreational uses. The UC Cooperative Extension Watershed and Natural Resource Program provide educational programs to inform people who own and/or manage the land and the animals grazing these lands. This work also includes applied research to develop new knowledge to effectively and efficiently manage rangelands and livestock in today's competitive and regulatory environment.



Advisor Larsen helping with harvest of a field trial testing several Intermediate Wheat Grass varieties, in Panguitch UT. We are hurrying to get the harvest completed to avoid an approaching thunder and lightening storm.

Addressing the Challenge

Continued struggles on the livestock industry

The livestock industry on the Central Coast is a major contributor to the local economy, adding multi-millions of dollars. One of the big issues that has affected the livestock industry is recurring droughts. Though 2017 was a wet year, 2018 was drier than normal. Previous to 2017 was a severe and long drought that had major consequences on the cattle industry from which they are still recovering. Cattlemen struggle each year to properly stock the right number of cattle on their ranches. This proper stocking rate is important to keep their ranches in a healthy sustainable way to insure they protect the environment. There are also lots of other animals, the wildlife, which depend on these ranches for a place to find food and shelter. Droughts can be a tremendous burden on the livestock industry, even causing some to go out of business during severe droughts. It has been a continued interest of Advisor Larsen to find plant species that can be planted on ranches to help alleviate some of the effects of droughts.

Advisor Larsen is currently on sabbatical leave, working with the USDA ARS Forage and Range Research Lab, located in Logan UT. The purpose is to learn of newly released varieties of perennial grasses, shrubs and forbs. I have traveled to Nevada, Idaho and Utah helping to collect data on many newly released or soon to be released varieties to determine which ones might do well and help improve forage production in Santa Barbara County.

Public Value

The University of California Watershed/Natural Resource program in Santa Barbara County focuses on developing and extending research based information to help ranchers, managers and owners of rangeland manage their land in a sustainable and productive manner. The livestock industry is an important economic part of agriculture in the County. Research and education helps sustain the livestock industry in Santa Barbara County through:

- Improving rancher sustainability by improving their practices which sustain their production, lands, and families.
- Promoting best management practices for helping ranchers survive through the drought.
- Providing research data demonstrating severity of the drought on forage losses, in order to help ranchers obtain financial help through USDA programs designed for drought relief.

Livestock & Range—Advisor Matthew Shapero

The Challenge

Rangelands in Santa Barbara County support a host of ecosystem services (water storage and filtration, wildlife habitat, carbon storage, scenic viewsheds), as well as provide the primary forage base for the county's thirty-million-dollar livestock industry. For generations, ranchers have worked to sustainably manage these rangeland ecosystems while providing a quality, safe agricultural product. Increasingly, however, the county's livestock industry faces new sets of ecological, economic, and regulatory challenges that complicate this work. The ultimate goal of the UC Cooperative Extension Livestock & Range program is to assist producers and rangeland managers alike to successfully navigate these challenges. The Livestock & Range program will provide relevant, science-based information and will develop an applicable and progressive research program to respond to the questions and needs of local clientele.

Addressing the Challenge

During the third quarter of 2018, Advisor Shapero progressed on a number of research projects in Santa Barbara County: 1) he completed his trace mineral blood sampling of cattle herds in the county and presented on the results at the September SB County Cattleman's Association Board of Directors meeting; 2) he submitted a proposal to conduct range seeding trials on three ranches on the Gaviota Coast; 3) he worked closely with Community Environmental Council, the SB County Agricultural Commissioner's Office, and the Cachuma Resource Conservation District on a Healthy Soils compost application demonstration project at the Ted Chamberlain Ranch; and 4) he coordinated with Cal Poly San Luis Obispo to conduct regular drone flights over a private ranch that will have a prescribed burn Fall 2018 in order to monitor vegetation recovery post-fire. Relatedly, Advisor Shapero worked extensively this summer with the Santa Barbara Range Improvement Association to help organize the county's first private prescribed burn in nearly twenty years. He is a regular attendee of Santa Barbara County Cattleman's Association meetings and is an ex-officio member of their Land-Use Subcommittee. He attended SB County Farm Bureau and SB County Agricultural Advisory Commission meetings to present on his program. In June he published the third installment of his quarterly newsletter, which included articles on the economics of Residual Dry Matter and health tips on how to prevent pinkeye in cattle. Finally, Advisor Shapero continues to respond to clientele inquiries and to meet with county residents to determine best directions for his extension programming.



Fall Residual Dry Matter sampling on a US Forest Service allotment in the mountains above the Cuyama Valley, September 2018

Public Value

The University of California Livestock & Range program in Santa Barbara County will provide science-based information to help ranchers, managers, and owners of rangeland manage their land in a sustainable and productive manner. Future research and education will benefit livestock operators and rangeland managers through:

- Addressing animal health issues that will increase the welfare and productivity of livestock.
- Promoting rangeland management practices that benefit both the land and the ranching operation.
- Facilitating conversation between community stakeholders in order to achieve lasting, responsible management.
- Improving animal genetics and performance, ranch profitability, and ecological sustainability.

4-H Youth Development—Advisor Liliana Vega with Janelle Hansen

The Challenge

Communities of scientifically literate, well-informed, and actively engaged citizens are essential to create positive changes needed to solve important issues facing our nation and help us to prosper in a global economy.

The University of California 4-H Youth Development Program provides training and resources to local volunteers who partner with youth to bring about positive change in our communities. The 4-H program equips youth with hands-on science activities, healthy living knowledge, leadership experiences, and service-learning opportunities. Participation in 4-H prepares youth to understand and acquire the skills that will allow them to become problem-solvers and astute leaders.

Addressing the Challenge

4-H staff supported adult volunteers and youth members in delivering positive youth development programming to members and their families in 22 clubs throughout the county. Participants engaged in hands-on experiential learning projects in the focus areas of Science, Leadership, Healthy Living, and Civic Engagement. Countywide 4-H activities, training meetings, and educational outreach events were delivered to 4-H youth, families, as well as the community at large, including:

- Youth members participating in the 2018 Santa Barbara County Fair. 4-H volunteer project leaders, 4-H members, and parents contributed a significant amount of their time and resources to the fair with a combined total of over 700 exhibits of livestock, hand-made items and educational displays.
- A collaboration between 4-H and the Santa Barbara County Health Department had 27 youth participating in 7.5 hours of hands-on 4-H educational STEM activities while their parents attended Community Workshops.
- Offered a Community Club Leaders training for 15 participants, which focused on youth engagement, policy, and program management.
- THRIVE Santa Maria-Bonita Healthy School Food Pantry where 4-H staff and volunteers present hands-on educational activities to 300 – 500 visitors at this monthly event.
- Over 200 visitors at the YMCA's Family Day in August and over 300 at the [Goleta Lemon Festival](#) participated in the interactive Agua Pura watershed educational model.



Youth engaged in the interactive Agua Pura watershed educational model at the 4-H booth during the Goleta Lemon Festival.

Public Value

In Santa Barbara County, the University of California 4-H Youth Development Program is focused on providing youth with opportunities to develop strong, positive youth-adult partnerships while engaging in meaningful activities, which lead to:

- Reduced participation in risky behaviors (e.g. underage drinking, sexual activity, gang activity), which can decrease related public costs.
- Increased academic success and/or science literacy, which contributes to a highly qualified and productive workforce.
- Increased civic engagement, which can strengthen communities through youth training in leadership skills, innovation, critical thinking, and healthy living.
- Increased youth literacy in science, engineering, and technology through special programming, projects, and access to University curricula.
- Increased environmental stewardship and agricultural knowledge, which ensures a safe, sustainable, and secure food supply.

Master Food Preserver Program—Advisor Dr. Katherine E. Soule with Dayna Ravalin

The Challenge

A resurging interest in food preservation in Santa Barbara County in recent years highlighted the lack of local information and resources on up-to-date and safe food preservation practices, critical in reducing serious illness. Responding to the community's interest and concerns regarding home food preservation, the UCCE in San Barbara County launched the Master Food Preserver program.

Addressing the Challenge

During this quarter the UC Master Food Preserver Program offered 3 Saturday morning classes for public attendance. These classes were well attended with almost 70 community members in attendance including several from the Santa Barbara County area. We also began an intensive 10-week training course with a group of new UCCE Master Food Preserver volunteers. They will graduate in October and begin their volunteer activities immediately.

UCCE Master Food Preservers were invited to participate in the UCCE Master Gardeners Fall Fruit Festival in September. This was a wonderful event providing great exposure for the UC Master Food Preserver program. We had almost 80 individuals receive information on safe canning practices for fall fruits and vegetables.

Additionally, one of our Santa Barbara County UCCE Master Food Preservers presented information at the Home Show and Expo held at the Madonna Inn Expo Center. Her topic included myths surrounding home food preservation and current recommendations for safety.

Improving our program's visibility in Santa Barbara County continues to be a high priority for our volunteers. We are looking to develop multiple strategies for program outreach in the upcoming year. We have established a steering committee for our program which includes two of our UC Master Food Preservers from Santa Barbara County to represent that region for future local programming efforts and volunteer recruitment.



UC Master Food Preserver, Kristin Carlton, demonstrating using an apple peeler corer at the UCCE Master Gardener Fall Fruit Festival
Photo credit: Theresa Reynolds

Public Value

The UC ANR Master Food Preserver program is a public service for residents who want to learn safe methods of preserving produce sources from farmers' markets, local grocery stores, or gardens. These efforts benefit Santa Barbara County through:

- Decreasing health care costs by reducing instances of food borne illness through safe home food preservation practices.
- Increasing community wellness by creating co-capacity building with volunteers who are trained to provide services at lower costs to community residents.
- Increasing environmental sustainability through decreased food waste by teaching residents how to preserve food that might otherwise spoil before consumption.
- Increasing economic stability by growing the purchasing power of residents who can use home food preservation techniques to maximize their food resources.
- Increasing the economic vitality of resident food producers by empowering consumers to choose locally grown commodities

Master Gardeners—Linda Baity with Dr. Christopher Greer

The Challenge

Communities beyond the reach of the land grant campuses of the University of California present special challenges for outreach and extension of research in new horticulture practices to home gardeners. Research based information about home horticulture, pest management; sustainable landscape practices and other environmental and natural resource issues support informed decisions by home gardeners promoting healthy, safe and prosperous communities in Santa Barbara County. Local certified Master Gardener volunteers, trained by the University of California provide information and problem solving opportunities.

Addressing the Challenge

For the second year, Master Gardeners were invited by the Santa Barbara Public Library to participate in Harry Potter Night at the downtown branch on March 9. Their “Herbology” table drew hundreds of visitors of all ages during the four-hour event.

Victory Vegetable Gardening is a new project launched recently, based on similar events that have been held successfully for the past few years in Los Angeles County. These classes feature Master Gardener volunteers teaching a series of four beginner vegetable gardening classes at Carpinteria Garden Park. Students learned the basics of planning and preparing their sites, starting seeds, choosing suitable varieties for planting in this area, responsible management of common garden pests and methods of safely harvesting and storing produce. Those who attended all four classes received Certificates of Completion. Future Victory Vegetable Gardening classes are being planned for additional community gardens in the county.

Two Information Overview sessions were held last month for the purpose of recruiting new volunteers into the upcoming Training Class of 2019. These sessions were held on Saturday, September 8th at the Goleta Valley Community Center for South County residents, and on September 15th at Stone Pine Hall in Lompoc for North County residents, both of which attracted a number of highly motivated applicants.

Master Gardeners staffed a Help Table during the annual Santa Barbara County Horticultural Society Plant Sale held on September 22^d at Trinity Gardens, in addition to maintaining a monthly presence at Farmers’ Markets in downtown Santa Barbara and in Old Town Lompoc. Volunteers also continued their recurring outreach to residents at Santa Barbara Botanic Garden, Alice Keck Park Memorial Garden, Mesa Harmony Garden, and La Huerta Historic Garden at the Old Mission.

These educational activities and events reached a total of 656 residents as Master Gardeners donated a total of more than 1,000 hours of volunteer service during this quarter, representing a value of \$29,177.27 to Santa Barbara County.



Master Gardeners Helen Wong and Diane Galvan presented a new series of four Victory Vegetable Gardening classes in September at Carpinteria Garden Park

Public Value

The University of California Master Gardener Program is focused on extending research based information on sustainable landscape practices. This effort benefits Santa Barbara County through:

- Safe gardening practices that help to protect water and water quality, support healthy ecosystems and enhance wildlife and biodiversity.
- Sustainable local food systems that enhance food security for families, neighborhoods, and communities.
- Sustainable landscape practices that create efficient communities by conserving water and energy, and reducing and reusing green waste.
- Effective prevention, detection and management of invasive and endemic species through public outreach and education that helps to preserve a prosperous agricultural economy.
- Increasing science literacy of Master Gardeners and their clientele through quality education and outreach.

UC CalFresh Nutrition Education—Advisor Dr. Katherine E. Soule with Shannon Klisch

The Challenge

In 2009, the Santa Barbara County Department of Public Health reported that approximately 1/2 of adults and 1/3 of teens in the county are overweight or obese. Obesity is a contributing factor of disease and death. Rates of obesity are generally higher among low-income populations.

To improve the health of the public, the University of California CalFresh Nutrition Education Program (UC CalFresh NEP) provides high-quality, nutrition and physical activity education programs for youth and adults in Santa Barbara County, focusing on low-income populations.

Addressing the Challenge

During August and September, UC CalFresh recruited approximately 76 new classrooms with approximately 3700 students to participate in comprehensive nutrition education service at five school sites in the Santa Maria-Bonita School District. These classrooms will receive No-Prep Nutrition Education curriculum kits which include all the materials and supplies needed to conduct evidence-based nutrition education aligned with California state standards. Classrooms will also receive four lessons or food demonstrations led by a UC Community Education Specialist throughout the school year.

In addition, staff recruited 80 5th and 6th grade students for the 4-H Student Nutrition Advisory Council (SNAC) Clubs. 4-H SNAC Clubs are a partnership between UC CalFresh, 4-H Youth Development and Santa Barbara County schools to foster leadership among youth around creating and advocating for healthy schools and communities. 4-H SNAC Clubs meet weekly throughout the school year to work on healthy living projects and develop leadership and public speaking skills.

Lastly, UC CalFresh staff worked to enhance and support school and community gardens in Santa Barbara County. In partnership with People's Self Help Housing, UC staff trained 12 community residents in garden enhanced nutrition education, food safety, presentation skills and growing with the seasons. Residents built an on-site garden with funding from the Whole Kids Foundation and UC staff are providing ongoing technical assistance in order to keep residents engaged in their community garden. At school sites, UC staff provide curricula, technical assistance and funding to reinvigorate or establish new edible gardens and engage students and parents.



4-H SNAC Students at Liberty Elementary contributed to the planning and design of their school garden. They came back to school to find gigantic squash and corn for their first bountiful harvest.

Public Value

The UC CalFresh NEP is focused on improving the health of the public, which in turn reduces public costs by providing research-based quality nutrition education. These efforts include:

- Serving as a vital bridge between the learning and knowledge of the UC system and our community
- Promoting healthy living, food safety, food budget maximization, and physical activity to CalFresh recipients and other low-income individuals, families, and youth
- Tailoring the latest science, curriculum and information to the needs, culture and language of low-income communities to provide culturally sensitive programming that meets nutrition education and resource needs in Santa Barbara County
- Enhancing individual efforts to make healthier lifestyle choices by utilizing the Socio-Ecological Model (SEM) to encourage social and environmental (e.g. home, school) changes

Strawberries and Vegetables—Advisor Dr. Surendra Dara

The Challenge

Public health and environmental resources are protected through efficient use of agricultural inputs and safe agricultural practices. Strawberry and vegetable growers and pest control advisors are continually in need of information on improved production technologies and strategies for managing endemic and invasive pests, diseases, and weeds. Optimizing inputs and maximizing returns with food safety in mind are key strategies for healthy, safe, and prosperous agricultural operations.

The Strawberry and Vegetable program identifies growers' needs, develops solutions based on sound scientific research, and extends information in a timely and proactive manner.



One of the tomato studies where biostimulant materials are tested

Addressing the Challenge

- Two tomato field studies evaluating various biostimulants are under way. A potted strawberry study demonstrated for the first time the antagonistic effect of two insect pathogenic fungi against the charcoal rot causing fungus. Completed a strawberry miticide study, which was inconclusive due to mite population decline.
- Published three co-authored articles in a UCANR eJournal, one in a trade journal, two UC Delivers stories, and YouTube video. Also published and submitted two manuscripts for two more trade journals and two manuscripts for scientific journals.
- Reached out to 71 people through individual consultations about strawberry and vegetable issues as well as urban and landscape issues, and 231 people through presentations at extension meetings. Provided input to two ANR news media sources on extension activities and pest issues.
- The 31 articles on my Pest News eJournal were viewed 7,701 times and the 100 on Strawberries and Vegetables eJournal were viewed 15,027 times during this quarter.
- UCCE continues to provide timely information on production practices, pest, disease, and weed management to the clients.

Public Value

The UCCE Strawberry and Vegetable program promotes a prosperous local economy, as well as a safe and healthy food system through:

- Improved production practices by optimizing input costs and increasing yields.
- Innovative research on alternatives to chemical fumigants, insecticides, miticides, fungicides, and improved Integrated Pest Management practices.
- Efficient use of fertilizers and irrigation water which contribute to reduced leaching of nitrates, reduced ground water contamination, and water conservation.
- Education on invasive pests and diseases that impact both the farming community and home gardeners which better equips them to take appropriate preventive and/or control measures.



Fire Ecology & Management—Specialist Dr. Max Moritz

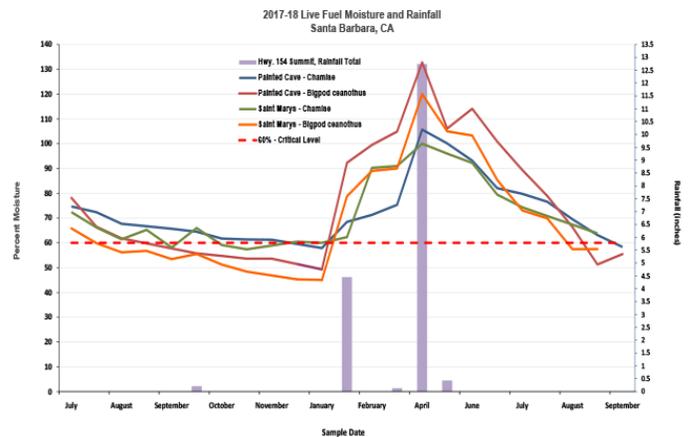
The Challenge

Understanding the nature of fire in California can help to save lives, minimize property damage, and protect the environment. Focusing broadly on fire ecology and management, this program brings UC research expertise to Santa Barbara County on the following topics:

- Quantifying the natural ranges of variation in fire regimes including frequency, size, seasonality and intensity within fire-adapted vegetation.
- Understanding where and when various fuel management techniques are likely to succeed and be sustainable.
- Mapping fire weather patterns, which historically have been associated with the greatest losses.
- Modeling linkages between fire activity and climate change.

Addressing the Challenge

During this quarter Specialist Max Moritz continued working with local citizen science volunteers to maintain local Live Fuel Moisture (LFM) data sampling and processing, which feed into regular updates and distribution through the Santa Barbara Botanic Garden website; we also finally completed the MOU between Santa Barbara City and the Santa Barbara Botanic Garden for sampling sites on local public land. As a board member of the Santa Barbara County Fire Safe Council, Moritz continued to work with local constituents on fire-related issues. The UCSB project on restoration of Bigcone Douglas fir in the Zaca Fire area of Santa Barbara County continues, as does the sundowner wind mapping project with other UCSB collaborators. Moritz also became involved in discussions with The Partnership for Resilient Communities, whose focus is on sustainable development in Montecito after the Thomas Fire last year.



Local live fuel moisture trends from our citizen science-based collections in the Santa Barbara front country. (see <https://www.sbbg.org/about/onsite-weather-station-live-fuel-moisture>)

Public Value

Fire is an important and natural process in almost every terrestrial ecosystem of California, yet it is one of the most persistent threats facing communities that live on fire-prone landscapes. Communicating and implementing the latest scientific information about fire research is crucial for making communities safer, reducing property damage, saving lives, and protecting the environment.

UC Cooperative Extension helps Santa Barbara County create safer, healthier and more prosperous communities through efforts that emphasize the following:

- Education of homeowners about fire danger and preparedness steps
- Communication with fire manager, policy makers, and planners about long-term fire-related decision making

Soils, Water, Subtropicals—Advisor Dr. Ben Faber

The Challenge

Santa Barbara County's agricultural competitiveness depends on adopting new scientific and technological innovations derived from new knowledge in agriculture. Research and educational efforts must enhance the opportunities for markets and new products. Creating a sustainable local agricultural economy also depends upon improving water quality, quantity, and security; managing pests and diseases; and improving cultural management practices for subtropical producers.

The Soils/Water/Subtropical Program has a 60 year history of local research and extension that optimizes crop production, maximizes net farm income, conserves natural resources and protects the environment.

Addressing the Challenge

On the weekend of July 6-8, extreme temperatures occurred throughout Southern California. These temperatures were in excess of 120 degrees F in some areas. Trees of all species were affected, even native trees, such as Coast Live Oak and Sycamore and exotics like Eucalyptus and Brazilian pepper. Up to the weekend, temperatures had been very mild. With the onset of the heat, tree stomates were forced to transpire at higher rates than which they could adjust to. Stomata act, to cool a tree, and when water flow through the tree is insufficient, the canopy heats up and turns brown, killing the green tissue. In young trees, the whole canopy may be killed to the ground. In older trees, it is just the green foliage and buds. The same vegetative and floral buds that are damaged in a hot fire, such as occurred in December. The new flush that was happening after the fire was most affected by this second round of heat. Although many different tree species were affected, avocados with their shallow root systems had the least resistance to this rapid transpirational demand.

This heat event is unprecedented. There have been hot periods in the past, although none this hot. What made this event so devastating was that the trees did not have time to adjust from a mild period of low evaporative demand to one of high in such a short 24-hour period. Even though this was an extreme event, trees given time to adjust and growers given enough advance warning probably could have sustained less damage with this amount of heat. The rapid occurrence of heat like this would probably be just as devastating in the future.



Heat Shriveled Fruit

Public Value

Healthy people and communities, healthy food systems, and healthy environments are strengthened by a close partnership between the University of California and its research and extension programs and the people of Santa Barbara County.

The Soils/Water/Subtropical Program provides innovation in applied research and education that supports:

- Sustainable, safe, nutritious food production through the delivery of information on soil and water management.
- Economic success in a global economy through production of high quality fruit.
- A sustainable, healthy, productive environment through improved water and nutrient management.
- Science literacy within the agricultural community promoted by rapid access to evidence based information.