

University of California Cooperative Extension Santa Barbara

Quarterly Report April—June 2018



UC Cooperative Extension Community Education Specialist supporting residents as they build and plant their community garden at Mariposa Townhomes in Orcutt, CA in effort to support healthy environmental changes.

Submitted by: Katherine E. Soule, PhD
Director of UC Cooperative Extension
Santa Barbara County
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University of California Programs- Advisors and Specialists in Santa Barbara County

PLANT SCIENCES AND HORTICULTURE led by Mr. Mark Battany, Dr. Surendra Dara, Dr. Ben Faber, and Dr. Mark Gaskell, 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.

YOUTH, FAMILIES, AND COMMUNITIES PROGRAMS led by Dr. Katherine Soule. The mission of the UC Youth, Families, and Communities Program, San Luis Obispo & Santa Barbara Counties 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, 4-H Youth Development, and UC Master Gardener 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.



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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 June 28th, Dr. Mark Gaskell retired after 24 years of service with the University of California; however, he will continue to work in Santa Barbara County over the next year as an emeritus advisor.

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 1 meeting during this period.

Santa Barbara County Agricultural Advisory Committee meetings in April, May, and June were attended by Advisor Battany, Dr. Dara, and Dr. Greer. Updates were provided on UCCE activities and upcoming events.



Liliana Vega began working as an area 4-H Advisor in San Luis Obispo and Santa Barbara Counties on July 10, 2018. She brings nearly ten years of 4-H experience in Idaho and has expertise in preparing youth for college and careers.

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.

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 second quarter of 2018, Advisor Shapero started a research project examining trace minerals in beef cattle across the county. To date, he has taken blood samples from eight herds to determine mineral deficiencies that may impact production. Preliminary results are being organized and management options will be made available to cattlemen in the coming months. In May and June, Dr. Royce Larsen and Advisor Shapero collected samples on their six forage production monitoring plots in the county. Results of this year's peak rangeland productivity will be made available to the Farm Services Agency. They expect to have 2-4 more forage production monitoring sites installed by this fall. In May, Shapero organized and hosted a Beef Quality Assurance workshop. Representatives from the National Cattlemen's Beef Association in Denver, CO came to the county to present on safe and proper techniques for transporting cattle. Shapero also spoke at a Thomas Fire and debris flow recovery evening program hosted by Santa Barbara County. He is a regular attendee of Santa Barbara County Cattlemen's Association meetings and is an ex-officio member of their Land-Use Subcommittee. Shapero continues to be in conversation with local ranchers and Santa Barbara County Fire about expanding a prescribed fire program on private lands in the county, and he intends to install research plots on a ranch that will be burned this Fall. Finally, Shapero continues to respond to clientele inquiries and to meet with county residents to determine best directions for his extension programming.



Advisor Shapero welcomes ranchers to the Beef Quality Assurance Transportation workshop on May 23rd in Los Alamos.

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 Dr. Katherine E. Soule 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

This year 4-H staff supported 202 adult volunteers in delivering positive youth development (PYD) programming to 767 youth members and their families in 22 clubs throughout the county. Additionally, 222 youth participated in the Vandenberg Air Force Base Military Club. 4-H participants engaged in hands-on experiential learning projects in the areas of Science, Leadership, Healthy Living, and Citizenship.

4-H staff supported the delivery of PYD programming to youth and families in the county through various events and activities, including:

- Sixty-seven students from Rice, Bruce, Adam and Liberty School's 4-H Clubs, in the Santa Maria Bonita School District, trained to be peer educators. This collaboration between UC CalFresh and 4-H provided healthy living education to over 3731 youth.
- Over 100 youth members came together for the annual Countywide 4-H Exhibit Day. This annual 4-H educational event allows youth members to showcase what they worked on during the program year, including showing large animals, small animals, and still exhibits.
- Over 400 visitors at the monthly THRIVE Santa Maria's Healthy School Pantry (HSP) program were provided hands-on STEM activities presented by 4-H staff, volunteers and youth members.
- A collaboration between 4-H, the Santa Barbara County Public Health Department and UC CalFresh had 38 youth participating in hands-on 4-H STEM activities while their parents attended Community Workshops.
- Collaborating with our community partner, Lockheed Martin, we presented *Drone Discovery*, a hands-on 4-H science challenge, to 48 youth at a United Way Fun in the Sun event.



A 4-H family at Exhibit Day 2018

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, pregnancy, 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 hosted an Open House on May 8th for public attendance. We had a terrific turn out with several participants coming from the Santa Barbara County area. We continue to focus our volunteer recruitment efforts in the county by having a Master Food Preserver attend the Santa Barbara Farmer's Market once a month providing safe canning information and program outreach. We are hopeful this activity can provide our program with increased visibility in the Santa Barbara County region, especially to residents in the southern area. Our monthly public classes continue to be a popular event with an increased attendance by Santa Barbara County residents.

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 are establishing a steering committee for our program which will include two of our certified Master Food Preservers from Santa Barbara County to represent that region for future local programming efforts and volunteer recruitment. We will continue to include a strong commitment of advertising our program and events through various media outlets serving the Santa Barbara County region.



UC Master Food Preserver, Mary Thieleke Jackson, discussing dehydration techniques of food with Open House attendee. 5/8/18
Photo credit: Dayna Ravalin

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 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 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

Master Gardeners staffed an Information Booth/Help Table during the Santa Barbara Earth Day Festival in Alameda Park on April 21 and 22. Volunteers connected with hundreds of county residents and visitors during the weekend celebration, providing research-based horticultural information designed to encourage the adoption of safe and sustainable home gardening practices. Master Gardener library talks during this period focused on the topic of Fire-safe Landscaping, in an effort to address the potential for damage and destruction of residential properties posed by the ongoing threat of wildfires. Presentations on this topic were presented on May 5th at the Carpinteria Library and May 20th at the Central Library.

Carpinteria Garden Park was the site of our expanded effort to provide science-based gardening advice to the public countywide. "Seed Starting" and "Container Planting" classes were presented to local residents in the beautiful new community garden located adjacent to Carpinteria's Amtrak station.

A second new project launched on April 1st was the Water-Wise Discovery Station at the Santa Barbara Botanic Garden. Master Gardener volunteers who were trained by the garden's Education Department will be on hand every Sunday afternoon to answer questions about selecting and caring for native plants and sharing tips for conserving water.

In addition to the Help Tables appearing bi-monthly at the Santa Barbara County Farmer's Market, Master Gardeners began participating in the Old Town Farmers Market in Lompoc by staffing a Help Table on Fridays evenings through the summer. A help table has also been added at Mesa Harmony Garden on the first Saturday of each month.

Master Gardeners collectively donated 1,026 hours of volunteer service to educational outreach during this quarter, representing a contributed value of \$29,846.34 to the County of Santa Barbara.



Master Gardeners designed and staffed an Information Booth during the 2018 Santa Barbara Earth Day festival April 21 & 22

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

UC CalFresh continued to partner with 97 educators at four schools in Santa Barbara County, providing comprehensive nutrition education services to approximately 3400 K-6th students. UC CalFresh also continued to partner with 4-H Youth Development to facilitate 4-H Student Nutrition Advisory Councils (SNAC) at four school sites. 4-H SNAC teams develop nutrition expertise and leadership skills to promote and advocate for healthy eating and active living changes at their school.

In April, twenty-four 4-H SNAC student leaders from five schools participated in a 4-hour culinary academy where they learned and practiced knife and stove top skills, food safety habits, and baking techniques. 4-H SNAC Youth selected three healthy, low-cost recipes to prepare during the academy including a blueberry muffin, vegetable sushi and an egg omelet. The goals of the culinary academy were to enhance students' skills in healthy cooking and to build confidence to conduct peer-to-peer nutrition education on their school campuses. At the end of the event students reported that they gained new skills they could use in their lives and at home. One student wrote: "I learned more about knife safety and that you need to measure properly in order to bake." Another student reported, "I got better at cooking so then I will cook food for my family."

Lastly, in June UC CalFresh partnered with the City of Santa Maria Parks and Recreation to train 15 youth services staff in CATCH physical activity curriculum. Parks and Recreation staff will be using their skills to promote physical activity at summer meals sites throughout Santa Maria.



UC CalFresh staff and SNAC student leaders learning knife and food safety skills while preparing ingredients for an omelet.

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.

Water Management and Biometeorology—Advisor Mark Battany

The Challenge

Growers of wine grape vineyards throughout California face challenges with increased competition for limited water supplies and potential changing climate conditions.

Improved information on climate conditions resulting from local field research can provide growers with the knowledge to make the most informed decisions possible to ensure that their vineyards remain productive and economically viable under these changing conditions.

The efficient management of irrigation water will become increasingly more critical in the future. Limitations of water supplies will force all farmers and other water users to generate the maximum possible returns from their available water.

Addressing the Challenge

Irrigating with low-quality groundwater

With pressure to continue planting crops in new regions, landowners often face the challenge of dealing with low-quality groundwater. This factor cannot be overlooked, because the long-term success of the planting depends upon having a water supply which meets the requirements of the particular crop. Ideally growers will have the flexibility to choose salt-tolerant crops if necessary. However two of the most dominant crops in the region, strawberries and grapes, as well as others are sensitive to elevated soil salinity and will experience reduced productivity as salinity increases. Some area wells produce water of such poor quality that few crops can be successfully grown with it; this is important to determine before developing a field, and should be one of the very first parameters assessed when evaluating a new site.

The most common problems with area water include elevated electrical conductivity, and/or excessive levels of chloride, sodium or boron. Elevated electrical conductivity impacts plants by reducing growth. Elevated levels of chloride and boron can cause toxic effects on plants. Elevated levels of sodium can also lead to toxicities, but is generally more of a concern for its negative impacts on the soil structure.

Dealing with low-quality waters involves choosing appropriate crops, using amendments to reduce sodium impacts, and leaching accumulated salts. Treating water to remove salts such as by reverse osmosis has a high cost and also generates a waste stream of brine that is difficult to dispose of. Future developments may offer new solutions for this challenge.



Soils impacted by sodium are often dark, as the organic matter floats to the surface in the dispersed soil. The outer white ring is formed by calcium, in this case from earlier gypsum applications.

Public Value

The University of California Viticulture/ Soils program in Santa Barbara County is focused on developing and extending critical research-based information to help wine grape growers maintain sustainable production. This effort benefits Santa Barbara County through:

- Achieving sustainable wine grape vineyards that enhance productivity, crop quality and economic returns to growers with benefits to the entire local economy.
- Vineyard irrigation and soil management practices that help reduce water use and maintain soil productivity, thus relieving the strain on impacted water resources and ensuring more reliable supplies for all water users.
- Improved understanding of frost conditions and protective measures to help achieve effective practices that minimize impact on water resources.

Small Farms and Specialty Crops—Advisor Dr. Mark Gaskell

The Challenge

Small-scale fruit and vegetable growers rely on relatively higher value, lower volume specialty crops to remain economically competitive. UCCE field trials and educational programs are focused on developing new crop alternatives and alternative cultural practices to make small-scale agriculture more viable and competitive in Santa Barbara County.

Field trials are conducted often and the results of these trials, associated greenhouse or laboratory studies, and the experiences of other specialists are then assembled into educational outreach programs to educate and guide growers and industry representatives on the best current science-based information.

Addressing the Challenge

Farm trials established comparing public raspberry and blackberry varieties

New raspberry and blackberry varieties have not been evaluated recently in California berry production areas. New varieties from Europe require 2-3 years of quarantine before they are available to California growers. Different pruning practices also can affect raspberry and blackberry production. These newly established trials are designed to evaluate public raspberry and blackberry varieties and alternative pruning management in coastal California growing conditions. The plots are all now uniformly established and harvest began in May and will continue throughout 2018 and again in 2019. Data from these trials will compare yields, fruit quality, and harvest periods between Ventura, Santa Barbara, and San Luis Obispo counties.

Development of Tea as Alternative Coastal California Agritourism Crop

Dr. Mark Gaskell has been helping prospective tea growers to develop new agritourism tea plantings in Santa Barbara County. Tea is established on one farm near Lompoc and two new plantings were established in Santa Barbara County - one near Santa Maria and a second near Buellton – with plans to develop pick / process your own tea as new agritourism ventures. Additional plantings are planned during 2018 for two sites in San Luis Obispo County. These new ventures are being developed as part of a growing interest in teas and tea plantings to provide tea harvest / tasting opportunities for tea enthusiasts.



New caneberry trials are comparing pruning management and production timing of different newer blackberry and raspberry varieties at two Central Coast farm sites.

Public Value

Small-scale agricultural producers need reliable and current information on the most promising crop alternatives and the most efficient cultural practices if they are to remain economically viable. Recent research and educational outreach programs have included:

- Development of alternative small fruit – berry crop varieties and cultural practices.
- Contributed to establishment of blueberries, blackberries, and raspberries as profitable new crops in Santa Barbara County.
- Development of new information and practices to guide organic strawberry and other long season organic fruit growers for efficient management of nitrogen and water.
- Development of the research and educational base for establishment of coffee and tea as new crops in Santa Barbara County.

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.

Addressing the Challenge

- Completed a study in fall-planted commercial strawberry field to evaluate beneficial microbial treatments to improve strawberry health and yield and three strawberry studies in an experimental field to improve crop health and yields and control diseases with biostimulants, organic minerals, and biopesticides. Preparations are under way to evaluate chemical, botanical, and microbial pesticides for managing two-spotted spider mite in strawberries. Another study to evaluate solar power light traps for managing lygus bug is underway in an organic strawberry field. A potted plant study to evaluate the effect of insect pathogenic fungi in controlling charcoal rot in strawberries is also under way. Two studies, initiated in cabbage and lettuce to manage aphids, were discontinued due to the lack of aphid infestations. Completed a study on managing the western grapeleaf skeletonizer with organic control options. Two tomato studies were initiated for evaluating microbial and botanical stimulants and will be completed in summer.
- Organized the annual Santa Maria Strawberry Field Day that was well-attended by the grower and agricultural industry communities.
- Co-authored a trade journal article on managing arthropod pests in zucchini with multiple control options.
- Reached out to 75 people through individual consultations about strawberry and vegetable issues as well as urban and landscape issues, and 276 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 e-Journal were viewed 3,853 times and the 97 on Strawberries and Vegetables e-Journal were viewed 13,099 times during this quarter.
- UCCE continues to provide timely information on production practices, pest, disease, and weed management to the clients.



Annual Santa Maria Strawberry Field Day at Manzanita Berry Farms

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.



Local leaders organized this meeting to educate our community about the science behind last year's devastating events and the need to be prepared for more of the same.

(meeting flyer from <https://www.cecsb.org/drought-fire-flood-climate-change-and-our-new-normal-actonclimate/>, one of the groups supporting meeting).

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 successfully added a new volunteer. 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. A key extension event during this quarter was his presentation in the “town hall” meeting at the Granada Theater (Apr 25) to several hundred attendees.

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 managers, 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

In the last three months we have had two avocado grower meetings, both having to do with irrigation and water management. One focused on the basics of applying water, how it can be measured and what are some of the fundamental differences in types of emitters available to growers and the problems associated with them. The highlighted speaker was Stewart Styles from the Irrigation Training and Research Center. The other program took a more bird's eye view of how to identify field problems using drones and satellite imagery. The speakers were Ali Pourreza and Khaled Bali from UC Cooperative Extension.

Another citrus grower meeting was held which focused on identifying and managing Asian Citrus Psyllid and the prospects for dealing with the issue of the bacterial disease – Huanglongbing or Citrus Greening – which can kill trees. Treatments for the psyllid are being coordinated with Elizabeth Grafton-Cardwell, an Entomology Specialist from UC Riverside. Mark Hoddle, a Biocontrol Specialist from UCR spoke on the performance of introduced parasitic wasps in controlling ACP.

A third grower meeting on water runoff from tunnels used in raspberry production presented data from three years of study. Different surface materials – weed cloth, barley cover crop, polyacrylamide gel, and mulch – were evaluated to reduce total runoff, sediment flow and nitrogen and phosphorus nutrients. The trial and meeting were coordinated with Cachuma Resource Conservation District and UC Riverside.

We have collected ash and soil samples from burned chaparral and avocado orchards. This is to assess the chemical nature of the ash for both its nutrient and toxic element concentrations, and for its potential human health effects. In the process, it has been possible to assess the recovery of burned avocados. It appears that many that were burned are making a comeback. It will still take several years for their full return to production.



Various stages of new growth flushing after fire damaged to avocado

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.