

**University of California Cooperative Extension**  
**Santa Barbara**  
Quarterly Report January—March 2018



Markers of debris flow, which buried avocado tree trunks during flooding in Carpinteria, CA

Submitted by: Katherine E. Soule, PhD  
Director of UC Cooperative Extension  
Santa Barbara County  
May 1, 2018

## 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 MANGEMENT, 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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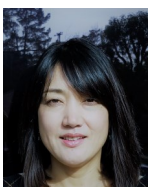
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## Administrative Accomplishments—Director, Dr. Katherine E. Soule

### 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.



Destruction of the 4-H Playa Del Sur's livestock facility in Carpinteria

### 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. Dr. Soule visited the livestock facilities for 4-H Playa del Sur Club in Carpinteria, which were destroyed in the January floods.

UC Advisors and Specialists collaborated with the Santa Barbara County Public Health Department, the Santa Barbara Botanic Garden, Santa Barbara County Fire Safe Council, Los Padres National Forest, Dignity Health, THRIVE Santa Maria, Santa Maria Bonita School District, Santa Barbara County Public Works, California Avocado Commission, Farm Service Agency, the Natural Resource Conservation Service, Cachuma Resources Conservation District, US Forest Service, Vandenberg Airforce Base, UC Santa Barbara, UC Davis, Goleta Union School District, and the USDA to support educational programs and research.

Livestock and Range Advisor Matthew Shapero is serving on the Santa Barbara Agricultural Preserve Committee during Dr. Royce Larsen's 2018 sabbatical leave. Advisor Shapero attend one meeting during this period.

Santa Barbara County Agricultural Advisory Committee meetings in January and March were attended by Dr. Gaskell and Advisor Shapero. Updates were provided on UCCE activities and upcoming events.

### 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 first quarter of 2018, Advisor Shapero assisted with the Thomas Fire recovery. He participated in the Thomas Fire Agricultural Stakeholders meeting in Carpinteria in early January, providing resources about rangelands to producers impacted by the fire. Subsequently, he has been involved in new discussions post-fire about expanding the county's prescribed burning program into the future. Regular discussions with Santa Barbara County Fire, other county departments, elected officials, and the local agricultural community are yielding measurable progress towards starting to burn on private lands to achieve vegetation management and range improvement. Dr. Royce Larsen and Advisor Shapero continue to expand their forage monitoring project in Santa Barbara County in order to track annual forage production on rangelands and installed another forage plot in the county. On February 20<sup>th</sup>, Cooperative Extension co-organized a very successful invasive plant workshop in Santa Maria, "Knocking Out Noxious Weeds on Rangelands." Over forty individuals attended, representing private industry, local ranchers, and public agency land managers. Finally, Advisor Shapero is assisting the Agricultural Commissioner's office and providing technical expertise regarding applying compost on rangelands to sequester carbon.



**Advisor Shapero speaking about the ecology and management of medusahead at the February 20th "Knocking Out Noxious Weeds on Rangelands" workshop in Santa Maria, co-organized by UCCE Santa Barbara**

### 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

4-H staff supported adult volunteers and youth members in delivering positive youth development programming to members and their families in 23 clubs throughout the county. Participants engaged in hands-on experiential learning projects in the focus areas of Science, Leadership, Healthy Living, and Citizenship. 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:

- Hands-on learning activities presented by 4-H staff, volunteers and youth members to over 400 visitors at the THRIVE Santa Maria's Healthy School Pantry (HSP) program, including displays on nutrition, arts & crafts, and science.
- County 4-H Presentation Day which gave 22 youth the opportunity to practice their public speaking skills and qualify for State 4-H Presentation Day. Youth attending also participated in an engineering tower building challenge and judging boards.
- The 4-H Agua Pura watershed model being presented to 522 students at the Goleta Union School District 5th Grade Health Fair.
- The California Bay/Coast 4-H Youth Summit where 11 youth and 1 chaperone attended a three-day weekend leadership conference in La Honda. Youth who attended the summit were engaged in workshops including STEM, Healthy Living, and civic engagement. They also learned a variety of leadership skills and communication skills.



**Youth from Bruce Elementary School and La Graciosa 4-H Clubs attending the 4-H Youth Summit**

### 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 was able to offer our first public class in Santa Barbara County! On March 24<sup>th</sup>, three of our Santa Barbara County Master Food Preservers taught a class about making your own jams and jellies using various preservation methods, at the Los Alamos Valley Men's Club in Los Alamos. The class was well received by the attendees. We are hopeful to offer more programming for those living in Santa Barbara County in the future. We also have a Master Food Preserver who has begun program outreach and education at the Santa Barbara Farmer's Market one Saturday a month. This activity should provide our program with increased visibility in the Santa Barbara County region, especially to residents in the southern area.

Increasing 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. By offering an Open House on May 8<sup>th</sup> to familiarize the community with our program and encourage certification of new volunteers, we are hopeful to garner more participation and interest in our program by Santa Barbara County residents. Our efforts will also include a continuation of advertising our program and events through various media outlets serving the Santa Barbara County region.



**UC Master Food Preserver, Dawn Peters, demonstrating how to make jelly to the class in Los Alamos**

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

On January 9, 2018, Master Gardeners began training classes for a class of 17 potential new volunteers. Twenty weeks of instruction are scheduled through mid-May, with sessions to be taught by experts in all areas related to urban horticulture selected from UC ANR specialists as well as UC faculty members.

Master Gardeners participated in a Winter Tree Pruning Clinic at Mesa Harmony Garden on January 20<sup>th</sup> in conjunction with California Rare Fruit Growers. An additional public education offering this month was a workshop entitled “Houseplant Jungle: A Guide to Indoor Plant Care” that was presented as part of our ongoing series of free classes at the Central Library in downtown Santa Barbara. During the Community Seed Swap event on January 28<sup>th</sup> at Trinity Gardens, Master Gardeners staffed a Help Table and gave away seeds and planting advice to many hundreds of local residents who attended.

Master Gardener Len Grabowski presented “Growing Orchids in Santa Barbara” on Saturday, March 3<sup>rd</sup>, at the Central Library, and again on March 10<sup>th</sup> as part of the 73<sup>rd</sup> Santa Barbara International Orchid Show. The workshop was attended by 55 show visitors, and volunteers also staffed a Help Table during all three days of the show.

Master Gardener events reached more than 1,300 residents at public sites throughout the community during this quarter, including on-going projects at La Huerta Historic Garden at the Old Mission, Alice Keck Park Memorial Garden, Mesa Harmony Community Garden, and the bi-monthly Help Table at the downtown Santa Barbara Farmers Market.

Master Gardeners devoted a total of 650 volunteer service hours to educational outreach during this quarter, representing a contributed value of \$18, 564 to the County of Santa Barbara.



**Members of the Santa Barbara County Master Gardener Training Class of 2018 began their 20 weeks of instruction on January 9, 2018. They are pictured here at the Santa Barbara Botanic Garden.**

### Public Value

The University of California Master Gardener Program is focused on promoting 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-6<sup>th</sup> 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. SNAC teams develop nutrition expertise and leadership skills to promote and advocate for healthy eating and active living changes at their school.

In March, UC CalFresh and SNAC focused on promoting National School Breakfast Week. Research consistently shows that there are numerous health and educational benefits related to participating in the School Breakfast Program. Further, school breakfast is a crucial support for families facing food insecurity. Working with food service and UC staff, SNAC leaders made signs and prepared samples of school breakfast for families to taste as they dropped their children off at school. Many families are unaware that their children have the option of eating breakfast for free at school every day. In addition to promoting breakfast at their school sites, one group of SNAC leaders also went to the food bank distribution near their school to speak with parents about the importance of eating breakfast. One parent told UC staff that participating in SNAC and the classroom nutrition lessons at school has made an impact on her daughter and her whole family. Her daughter brings the information home and has helped make healthy changes including encouraging her to buy whole wheat tortillas instead of white flour and using oil instead of lard.

“Cuando quiero ponerle manteca a los frijoles ella me ha dicho que mejor use aceite de olivo. Y pues como le digo que no?”



**4-H SNAC leaders sampling school breakfast with families. School breakfast helps students get the nutrients they need to focus at school and helps families facing food insecurity.**

### 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



## Viticulture—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

The spring conditions of 2017 were unusually wet which likely contributed to some very uncommon outbreaks of Downy Mildew in grapes in areas of Santa Barbara County (as well as areas in San Luis Obispo County). The disease was mostly, but not exclusively, observed in the more coastal production area. Soon it will become evident if the disease will also be a factor in 2018; the relatively late rainfall of this recent winter may create conditions that again favor the disease.

This is not a disease that growers in California normally have to contend with, and as such it caught many in the industry by surprise. Most California growers have probably never seen the disease, unless they have farmed east of the Rockies where it is a common problem. In the words of a UC plant pathologist, Downy Mildew is a “very mean disease” in that it can cause severe and widespread damage in a very short period. Growers should conduct regular and thorough disease scouting, and if any outbreaks are found they should respond as quickly as possible.

Control measures include copper sprays and various fungicides which are not routinely used on grapes in most of California. Most vineyards in the region, particularly in the more inland areas, are not likely at risk for this disease and thus applying preventative sprays does not appear warranted based on current knowledge. Coastal vineyards in areas where the disease was observed in 2017 are better candidates for including Downy Mildew control products.



**Downy Mildew infection of a grape flower cluster in the Santa Maria area in 2017**

### 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

#### Annual Meeting – North America Raspberry and Blackberry Association

Small Farms and Specialty Crops Advisor Mark Gaskell assisted with planning and hosting of the Annual North America Raspberry and Blackberry Conference (NARBA) in Ventura Feb 22-24, 2018 (also see <http://www.raspberryblackberry.com/detailed-conference-schedule/>). Dr. Gaskell hosted one technical session at the meetings and also presented two papers on Primocane Blackberry Management in California and Temperature Challenges to California Small Fruit Production.

#### Development of Tea as Alternative Coastal California Agritourism Crop

Small Farms and Specialty Crops Advisor Mark Gaskell was an invited speaker before the two-day Global Tea Initiative Symposium at UC Davis Feb 21-22, 2018. Dr. Gaskell described work with new prospective tea growers over the past two years to develop new tea plantings in Santa Barbara and San Luis Obispo counties.

#### Planning for Research Collaboration on California Coffee Production with NASA Ames Research Center – Albany, CA.

Small Farms and Specialty Crops Advisor Mark Gaskell met with Dr. David Bubenheim of NASA – Ames to discuss possible areas for future collaboration on coffee physiology in different coffee growing systems in California. Drs. Gaskell and Bubenheim have since continued the collaboration with two research proposals which have been submitted for future funding of coffee research.

Dr. Gaskell has also continued visits to new coffee plantings in Santa Barbara County and additional new planned coffee growing sites in Santa Barbara County to assist growers with establishment and management plans for the coffee plantings.



Additional new Santa Barbara County field trials evaluating coffee production with plants trained on wire trellises are focus of new coffee research collaboration with NASA-Ames.

### 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

- Initiated a new study in fall-planted strawberry to evaluate beneficial microbial treatments to improve strawberry health and yield. Also initiated three strawberry studies to improve crop health and yields and control diseases with biostimulants, organic minerals, and biopesticides; and another study to evaluate the role of lygus damage in fruit deformity. Initiated two studies in cabbage and lettuce for managing aphids. Working with industry collaborators on other studies in spring and summer.
- Made arrangements for the annual strawberry field day to be held in May.
- Authored/co-authored four eJournal articles on an invasive pest, biopesticides, and nutrient management. Published one trade journal article on spotted-wing drosophila management and submitted another one on zucchini pest management. Published two journal articles on biopesticides, and submitted another one.
- Reached out to 91 people through individual consultations about strawberry and vegetable issues as well as urban and landscape issues, and 258 people through presentations at extension meetings. Provided input to five news media sources on different crop or pest related issues.
- The 32 articles on my Pest News eJournal were viewed 2,594 times and the 97 on Strawberries and Vegetables eJournal were viewed 16,337 times during this quarter.
- UCCE continues to provide timely information on production practices, pest, disease, and weed management to the clients.



Strawberry study evaluating fertilizers, biostimulants, and beneficial microbes for improving crop health and fruit yield

### 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 better equips them to take appropriate preventive and/or control measures



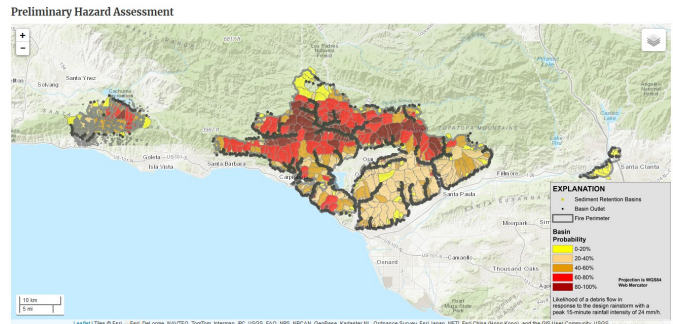


## Fire Ecology & Management—Specialist Dr. Max Moritz

### 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.



**Debris flow likelihood map of recent local fires. The worst events were in Montecito, although many smaller events have occurred in areas with much less development. (see [https://landslides.usgs.gov/hazards/postfire\\_debrisflow/detail.php?objectid=178](https://landslides.usgs.gov/hazards/postfire_debrisflow/detail.php?objectid=178)).**

### 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.

As a board member of the Santa Barbara County Fire Safe Council, Moritz continued to work with local constituents on fire-related issues; however, much of the Council's activities were reduced due to holidays and emergency operations in this quarter.

The UCSB project on restoration of big cone Douglas fir in the Zaca Fire area of Santa Barbara County continues, as does the sundowner wind mapping project with other UCSB collaborators.

Early in the quarter, devastating debris flows were experienced in Montecito (Thomas Fire) and near Burbank/Sun Valley (La Tuna Fire). The potential for debris flows in Santa Barbara County will be relatively high for at least the next couple of years (see above).

### 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

Made 12 farm calls to evaluate fire, smoke and debris flow damage to orchards in the Carpinteria area.

I helped with Master Gardener training giving two sessions, one on soil management and the other on citrus/avocado management.

Presented at the CA Weed Science Society Annual meeting held in Santa Barbara, covering weed management and impact of naturally occurring leaf mulch.

Organized an avocado grower meeting on Biological Control in Avocado, attended by 78 growers.



Smoke impact on mandarin fruit drop, Carpinteria



Buried Avocado Trunks from Debris Flow, Carpinteria



Fire evaluation, Carpinteria

### 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