University of California Cooperative Extension Santa Barbara

Quarterly Report October—December 2018

Healthy Soils Project Field Day at Chamberlain Ranch

Advisor Shapero presents at a Healthy Soils demonstration project field day, October 23, 2018. Here he is discussing grazing systems and the factors that affect rangeland forage production.

Submitted by: Katherine E. Soule, PhD
Director of UC Cooperative Extension
Santa Barbara County
January 28 , 2019

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 RESOUCES, 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.

UC Cooperative Extension Advisors and Specialists in Santa Barbara County

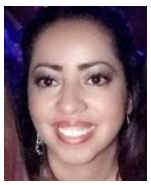
Royce Larsen, Ph.D.
805-434-4106
relarsen@ucanr.edu

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
mwkshapero@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.

Presentation of the CSAC Merit Award for Co-Creating Youth Advocacy for Healthy Communities.

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 December 20th, Dr. Soule attended the Agricultural Commissioner Weights & Measures Department staff meeting, along with Advisor Shapero, Dr. Ben Faber, and Dr. Chris Greer. This was a wonderful opportunity to strengthen relationships between UC Cooperative Extension and the Department. We also received a CSAC merit award for our program.

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, Santa Barbara Mission Partnership for Resilient Communities, 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 programs.

Livestock and Range Advisor Matthew Shapero served on the Santa Barbara Agricultural Preserve Advisory Committee during Dr. Larsen's 2018 sabbatical leave, attending 3 meetings during this period. Santa Barbara County Agricultural Advisory Committee meetings in October, November & December were attended by Dr. Faber, Dr. Soule and Dr. Tietje. 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

For more information contact Dr. Katherine Soule Email: kesoule@ucanr.edu Phone: 805-781-5940

Integrated Pest Management — 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.

Early stage of Botrytis fruit rot on strawberry.
Credit: Jack Kelly Clark, UC ANR

Addressing the Challenge

During the quarter, Advisor Dr. Chris Greer continued establishing relationships and priorities to support his integrated pest management program with an emphasis on plant pathology. Efforts have focused on better understanding local needs and developing resources to address these needs:

- Presented a session on “Fundamentals of IPM: How Do You Actually Do It” collaboratively with Mel Graham, Santa Barbara County Agricultural Commissioner’s Office Agricultural IPM Specialist at the 2018 Sustainable Ag Expo in San Luis Obispo.
- Attended the Association of Applied IPM Ecologists Annual Meeting.
- Participated in an Invasive Shot Hole Borer Class and Field Training to gain a better understanding of this emerging issue in Santa Barbara County.
- Completed requirements for 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.
- Participated in the California Department of Food and Agriculture Pierce’s Disease Research Symposium to gain more knowledge related to this important grapevine disease as well as emerging grapevine pests such as Grapevine Red Blotch and Grapevine Leafroll associated viruses.
- Served as an appointed member of the California Department of Food and Agriculture California Invasive Species Advisory Committee.

Public Value

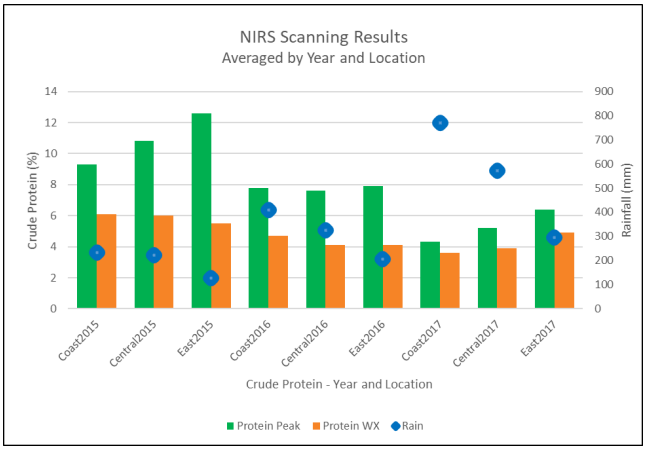
In Santa Barbara County, the University of California Integrated Pest Management Program helps residents, growers, land managers, community leaders, and professional pest managers prevent and solve pest problems with the least unintended impacts on people and their surroundings, which can lead to:

- 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.



Results for protein on forage samples, at Peak Production (Peak, in April), and Weathered (WX, in October) for rangeland forage samples. These were collected in coastal areas (Coast), central portion of the county (Central), and the eastern side (East), during 2015, 2016 and 2017. Rainfall is shown for each location and year. Results changed based on location and year because varying rainfall amounts resulted in different species composition and total production.

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. During this period, Advisor Larsen was working with the USDA ARS Forage and Range Research Lab, located in Logan UT, while on sabbatical leave. While at this lab he was able to use the facilities test forage quality samples from across San Luis Obispo County. The analysis was accomplished using the Near Infrared Spectroscopy. This was the beginning of testing forage samples in order to build a long-term data base of forage quality to help the producers in San Luis Obispo County determine supplements needed for their operations.

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.

Email: mwkshapero@ucanr.edu Phone: 805-645-1475 Web: cesantabarbara@ucanr.edu

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 fourth quarter of 2018, Advisor Shapero was most active with extension talks and presentations. In late October, he presented at the Healthy Soils Field Day at the Ted Chamberlain Ranch, an event co-sponsored by the Community Environmental Council, the SB County Agricultural Commissioner's Office, and the Cachuma Resource Conservation District. Also in late October, he led a half-day CalNaturalist course at the UCSB Sedgwick Reserve. In early November, Advisor Shapero hosted the 1st Annual Livestock & Range Symposium, which drew over 50 ranchers to the Far Western in Orcutt to hear from professors and specialists from UC Davis. Also in November, he worked with the SB County Range Improvement Association to successfully conduct a 400-acre prescribed burn on ranch—the first private burn in the county in over ten years. Advisor Shapero attended the October and November meetings of the Santa Barbara County Cattleman's Association and is an ex-officio member of their Land-Use Subcommittee. Additionally, Advisor Shapero serves on the county's Agricultural Preserve Advisory Commission and attended the October-December meetings. Finally, Advisor Shapero continues to respond to clientele inquiries and to meet with county residents to determine best directions for his extension programming.

Members of the Santa Barbara County Range Improvement Association listen to a briefing from Fred Tam of Santa Barbara County Fire before beginning firing operations on a prescribed burn. Orcutt, November 2018.

Advisor Shapero has worked extensively with Cachuma Resource Conservation District, the Santa Barbara County Agricultural Commissioner's Office, Community Environmental Council, and the Ted Chamberlain Ranch on a Healthy Soils demonstration project examining compost application on rangelands.

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.

Email: mwkshapero@ucanr.edu Phone: 805-645-1475 Web: cesantabarbara@ucanr.edu

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.

SMBSD 4-H youth and UCCE staff with experts from their community who attended the mini career fair allowing youth to explore different career paths including engineering, health, teaching in higher education and business.

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.

Community Club Leaders training for 17 participants, which focused on youth engagement, policy and program management.

A 4-H youth accepted the National 4-H Week Proclamation at the County Board of Supervisors meeting.

Twenty-eight students from four School 4-H Clubs, in the Santa Maria Bonita School District, participated in a training focusing on building leadership and presentation skills. It also included a mini career expo with experts from the community.

State 4-H required leadership training for 33 new and returning volunteers facilitated in-person by local 4-H staff.

A collaboration between 4-H and the Santa Barbara County Public Health Department had 27 youth at Ontiveros Elementary and 24 youth at Jimenez Elementary participating in over 6 hours of hands-on 4-H STEM activities while their parents attended workshops.

19 Vandenberg Airforce youth participated in Code Your World the 2019 National Youth Science Day experiment.

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.

Email: jmmhansen@ucanr.edu Phone: 805-845-4368

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.

UC Master Food Preserver new graduates
From left: Dr. Katherine Soule, Karen Weems, Ashley Kaher, Shawn Dunn, Carol Michael, Dayna Ravalin
Photo credit: Wes Weems

Addressing the Challenge

During this last quarter of 2018, the UC Master Food Preserver Program graduated 4 new volunteers. These individuals completed an intensive 10-week training course which included topics such as food safety, kitchen management, and food preservation techniques which they will then share this information on to our local communities through workshops, helpline assistance, and working in local food banks. These efforts align with UC ANR Public Value Statement "Safeguarding abundant and healthy food for all Californians". Through education, our goal is to teach Santa Barbara County residents how to maximize their garden harvests or utilization of local growers and farmers' market purchases using safe food preservation techniques.

Improving our program's visibility in Santa Barbara County will again be a high priority for our volunteers. We continue the development of multiple strategies for program outreach in the upcoming year. One such strategy includes the planning for offering a volunteer training in 2019. We are looking to train a cohort of new volunteers in Santa Barbara County drawing from both the southern San Luis Obispo County and entire Santa Barbara County regions. Our intent with this training is to increase our volunteer reach in Santa Barbara County by offering consistent food preservation and food safety programming using local volunteers who are also residents in the County.

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

Email: dravalin@co.slo.ca.us Phone: 805-781-5944

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

The California Avocado Festival held in Carpinteria on October 5-7 was the site of a Master Gardener educational booth entitled "Grow Your Own Salsa," a crowd favorite that taught more than 1,400 visitors how to grow tomatoes, peppers, onions and cilantro as volunteers spread the word about the UC Master Gardener program in Santa Barbara County. Master Gardeners presented a "Winter Deciduous Pruning Clinic" on Saturday, December 8, at La Huerta Historic Orchard at the Mission, providing information on the care and pruning of deciduous fruit trees for local residents. A free public education workshop entitled "Straw-Bale Gardening" was held in the Faulkner Gallery at the Santa Barbara Public Library downtown on Saturday, October 20.
Help Tables at Santa Barbara Farmers' Market, Mesa Harmony Garden, and the Santa Barbara Botanic Garden Discovery Station provided science-based information on sustainable home gardening practices to visitors. In total, Master Gardeners connected with a total of 2,125 residents during the quarter, donating 425 hours of volunteer service during this quarter, representing $10,493 worth of horticultural education and outreach to Santa Barbara County.

Master Gardener Barb Nagle-Statler and Deborah Meade were two of the many volunteers who prepared the "Grow Your Own Salsa" booth and greeted hundreds of visitors during the 32nd annual California Avocado Festival held in Carpinteria October 5-7, 2018.

Master Gardeners Trudy Adair-Verbais and Janet Rogers presented a free public workshop entitled "Straw Bale Gardening" to a crowd of interested residents on October 20, 2018, at the Santa Barbara Public Library.

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.

Email: lsbaity@ucanr.edu Helpline: 805-893-3485

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.

4-H SNAC Club Students interact with a Santa Barbara County Public Works engineer at the 4-H SNAC Career Expo in November.

Addressing the Challenge

In November 2018, UC CalFresh hosted their fourth annual youth leadership training in partnership with the 4-H Youth Development program and the Santa Maria-Bonita School District. Twenty-eight youth from four school-based 4-H Student Nutrition Advisory Council (SNAC) clubs participated in the youth leader training. The 4-H SNAC Club youth participated in interactive work shops focused on career development, leadership, presentation and public speaking skills and physical activity and nutrition. The day started with a career planning activity and a mini career expo where youth got to hear from and ask questions to a variety of professionals in their community. Career expo representatives included employees from the Santa Maria Fire Department, Santa Barbara County Public Works, Hancock College, Dignity Health and a local dentistry practice. After participating in the 6-hour training and career expo, youth said they learned how to present better and be more confident, how to be a great leader, how to speak in front of people, and learn about what they want to be when they grow up. One youth was excited to announce that he learned he wanted to be an engineer after learning about the field and talking with the engineers at the career fair.

In addition, UC CalFresh continued to support 76 teachers and 3700 students with comprehensive nutrition education service at five school sites in the Santa Maria-Bonita School District. The teachers received No-Prep Nutrition Education curriculum kits. Students received their first two lessons and cooking demonstrations led by a UC Community Education Specialist during this quarter.

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

Email: sklisch@ucanr.edu Phone: 805-781-5951

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

Water scarcity and frost protection

Wine grapes and other crops grown on the Central Coast are sensitive to spring and fall frost damage. Where water supplies are abundant, sprinklers are often the first choice for frost protection because they can reliably protect to relatively low temperatures. The downside to sprinklers is their requirement for large volumes of water, often an inch or more per frost night. In areas where water supplies are scarce, alternatives to sprinklers may be needed. The primary alternative is often wind machines, which have a long history of use in many parts of the state and worldwide. However, for regions where the use of wind machines has been minimal or nonexistent, farmers face uncertainty in investing in the machines because the local usefulness has not been proven already by other farmers. The best solution for such a situation is to take the basic measurements necessary to determine whether or not wind machines will provide a useful benefit at a given site; this can be done at very low cost using inexpensive "temperature inversion towers" as described on this website: http://cesanluisobispo.ucanr.edu/Viticulture/Frost_Protection/

Ideally this assessment would be done for several years prior to the initial development of a property, but it can be done at any time provided that the current frost protection activities do not disrupt the natural temperature conditions. This type of measurement can also be added to existing weather stations to provide the farmer with real-time information on the inversion conditions, which may help guide their responses to frost conditions.

UCCE Inversion Tower

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

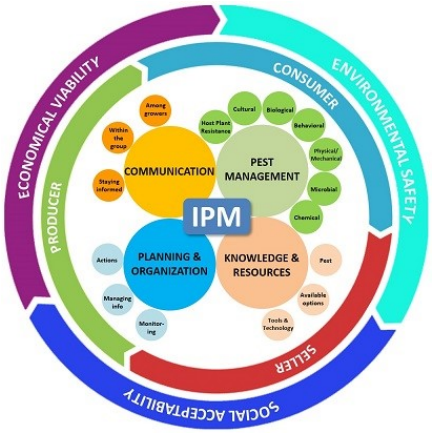
Email: mcbattany@ucanr.edu Phone: 805-781-5948

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.



The new IPM model that received considerable positive feedback from growers, PCAs, and academics (https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=28210)

Addressing the Challenge

- Successfully completed two tomato field studies and initiated a new strawberry study to evaluate various biostimulants.
- Authored an article on microbial control of pests and diseases for a newsletter, three articles on IPM-based food production and entomopathogenic fungi for trade journals, and co-authored revised pest management guidelines for strawberry and cole crops. Also authored a chapter on entomopathogens and their interaction with other pest management options for a book.
- Reached out to 101 people through individual consultations various agronomic and pest management issues, and 85 people through presentations at extension meetings.
- 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.

Email: skdara@ucanr.edu Phone: 805-788-2321 Web: ucanr.edu/strawberries-vegetables @calveggies @calstrawberries

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 though 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. 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. Moritz continue discussions with The Partnership for Resilient Communities, which should lead to a major FEMA proposal for fire preparedness across the region next year.

This image is from one of the widely carried extension pieces Max Moritz wrote during this period, which saw major wildfires across both northern and southern California. (see https://theconversation.com/wildfires-are-inevitable-increasing-home-losses-fatalities-and-costs-are-not-101295)

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.

Email: mmoritz@ucanr.edu Phone: 805-893-2125

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.

Spotty frost damage to avocado trees this winter. Not enough to kill, but enough to pay attention.

Addressing the Challenge

There has been little frost damage so far this year to subtropical trees, although there was spotty amounts over the winter break. Grower calls, as a result, have been minimal over this early winter period. We produced our quarterly Topics in Subtropics Newsletter during this period - http://ceventura.ucanr.edu/newsletters/Topics_in_Subtropics77282.pdf and we continue to produce a weekly blog on all things subtropical - https://ucanr.edu/blogs/Topics/

We had the annual CA Avocado Society grower meeting in October, with about 150 in attendance. We had a group of Israeli irrigation scientists tour the area in October, as well. In November, we convened at UC Riverside to interview candidates for the Citrus Specialist position who will focus primarily on horticultural practices with attention to methods to reduce the impact of Huanglongbing (Citrus Greening) which is beginning to affect trees in the Orange, Los Angeles and Riverside County areas. So far the disease has not been reported in Santa Barbara County, although there have been finds of the Asian Citrus Psyllid which carries the disease-causing bacteria. In October, we began the monthly "UC Ag Experts Talking" webinars which provide Continuing Education Units for growers, farm managers and Pest Control Advisors. These webinars provide a range of topics that qualify for CA Dept Pesticide Regulation yearly training requirements for ag professionals.

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.

Email: bafaber@ucanr.edu Phone: 805-645-1462