HEALTHY FOOD SYSTEMS • HEALTHY ENVIRONMENTS • HEALTHY COMMUNITIES • HEALTHY CALIFORNIANS

University of California
Agriculture and Natural Resources
Making a Difference for California

University of California Cooperative Extension Monterey County Biennial Report 2017-2019

UC CE

University of California
Agriculture and Natural Resources

Cooperative Extension Monterey County

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September 20, 2019

Dear Honorable Supervisors of Monterey County, Department Heads,
and members of the community;

The University of California Cooperative Extension (UCCE) is excited to present our 2017-2019 Biennial Report, demonstrating our commitment to research, research-based education and information, and technical expertise serving Monterey County. This report highlights our impacts, which enhance quality of life and the environmental, social and economic well-being of our residents. Our Academics, staff, and volunteers continue to bring the highest quality of science to address local issues especially related to agriculture.

In UCCE Monterey we have developed a framework and set out many of the issues that need to be considered in deciding how to improve the livelihood of our constituents by evolving our services. State and Federal government still maintain a regulatory role in agricultural research and also a financing role for some types of research, particularly applied one. Research and extension systems play a crucial function in agricultural and rural development, and they are central to realizing the potential of agricultural innovation. Innovation is key to agricultural development. Realizing the potential of agricultural innovation requires research and extension systems and other knowledge institutions to be stronger and better connected with each other and with farmers and their organizations.

As we celebrated our centenary (May 2018) and received from you a Resolution, we feel that although the total economic impact of UCCE Monterey is difficult to quantify, our contributions to science and development in these 2 years, represented by our direct outputs, are captured with the production of **39** peer-reviewed publications in scientific journals, **116** non peer-reviewed publications serving the layman, **51** blogs posted in our Salinas Valley Agricultural Blog, **306** workshops, seminars or conferences presented, attended by **12,045** participants, **107,769** volunteer hours by our two programs 4-H and Master Gardeners (with a **$3,227,652** value), **7,148** volunteer contacts with our constituents, and **$ 3,885,747** funded by contracts, grants and donations that were reinvested in our communities.

We couldn't have done it without your support and commitment to our mission. I hope you enjoy reading through this report, and if you have further questions, do not hesitate to contact me.

Sincerely,

María de la Fuente, PhD
Department Head / County Director

Sixteen Ways UC Cooperative Extension is Working for You

Supporting Agriculture. This $4+ billion industry relies on UC research and extension to remain strong and globally competitive. Cooperative Extension has been behind the growth of the local agribusiness industry since 1918.

Spurring Economic Development. UC research helps Monterey County's #1 economic driver—agriculture—be competitive and productive.

Promoting Food Safety. In-Field experiments show the best ways to prevent harmful microbes from contaminating field produce, protecting consumers and the viability of local agriculture. Local advisors team with campus-based food safety researchers to bring expertise to the county.

Brokering Solutions. Cooperative Extension is the neutral party bringing together entities who need to work together to find workable solutions to vexing issues.

Teaching Sustainability. We develop and share various approaches to achieve a healthier environment, a thriving agricultural business cluster, and a community driven by engaged youth and adults.

Reducing Pesticide Use. Farm advisors inform growers about the most effective ways to treat pests including biological control and computer guided technologies. Using scientifically tested treatments can save thousands of dollars.

Saving Soil. Techniques developed by the farm advisors keep tons of soil in place, preventing erosion, saving valuable topsoil, and pollution of water bodies.

Saving Water. Farm advisors teach farm owners and their irrigators ways to improve irrigation efficiency and to use less water.

Channeling UC Expertise. Cooperative Extension collaborates with many UC researchers to help solve the current environmental, agricultural or quality of life issues affecting Monterey County residents.

Beginner & Minority Famers. Enhancing the competitiveness and sustainability of beginning and minority, farmers and ranchers in California.

Creating Tomorrow's leaders. We certify over 300 adults to work with youth, using the latest research on youth development practices to instill qualities our young people need to succeed.

Minority Youth Development. Monterey County 4-H Diversity Program is a pilot program promoting youth development for less advantaged Latino youth in the community.

Supporting Military Kids. The 4-H Program reaches out to military youth, offering them fun experiences while cultivating their developmental and coping skills.

Providing Community Service. Youth in 4-H, along with their parents, donate hundreds of hours to creative local community service, and educating community members at county fairs or other events.

Beautifying Public Places. UC Master Gardeners, now numbering in the hundreds in Monterey County, devote time and energy to restoring historical gardens and preserving sensitive plant habitat and beneficial organisms, and to educate our residents about gardening and food production.

Next Generation in Agriculture. UCCE hires student assistants to allow hands on learning experiences for youth interested in exploring careers in agriculture.

County Funded Administrative Positions

Kelley Sivertson

Administrative Services Assistant

4 years with UCCE

Administrative Services Assistant

This position is our Office Manager for University of California Cooperative Extension and County of Monterey business operations. Responsibilities for both agencies include Finance Management (budget development and monitoring, grant fund management, Purchasing, Accounts Payable) Human Resources, Supervisor for Administrative Staff including the Accounting Technician, Secretary, and part-time assistants. This position is knowledgeable of policies and procedures for both agencies and the many web-based programs associated with them. The ASA is the assistant to the Department Head.

Lennis Arriaga

Accounting Technician

12 years with UCCE

Accounting Technician

This position keeps track of University of California grant funds. This involves maintaining spreadsheets, preparing purchase orders and being the receiver for purchasing card purchases. The position is knowledgeable of U.C. policies and procedures and the web-based programs. Works closely with the ASA and U.C. advisors regarding the management and consolidation of grants.

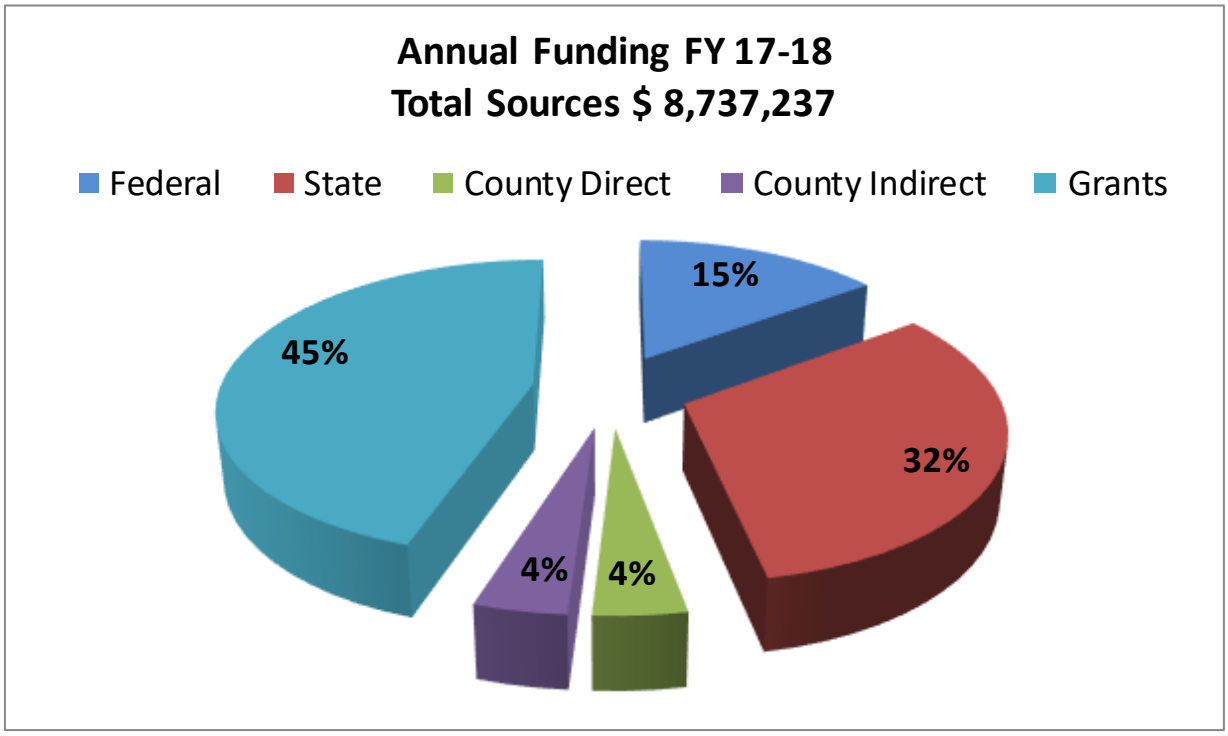
Jessica Rodriguez

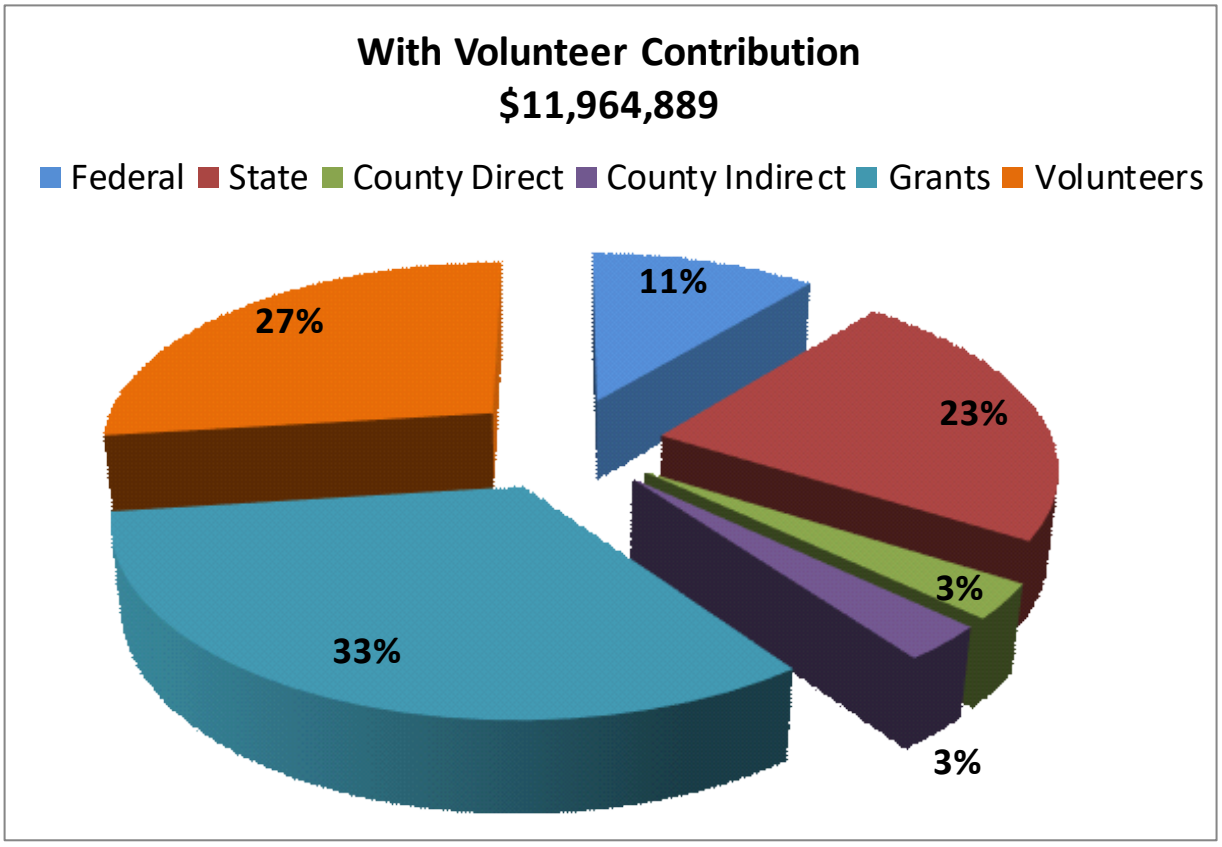
Department Secretary

3 months with UCCE

Department Secretary

This position provides secretarial support for the 4-H Youth Program which involves serving the clientele, enrollment, training, assisting the Youth Advisor and Program Representative with projects and events. The position is knowledgeable of the web-based 4-H Enrollment Program. Provides support for U.C. advisors and other staff members. The position serves as our web master and handles our desktop publishing.


Annual Funding FY 17-18
Total Sources $ 8,737,237
Federal
State
County Direct
County Indirect
Grants
15%
32%
4%
4%
45%


With Volunteer Contribution
$11,964,889
Federal
State
County Direct
County Indirect
Grants
Volunteers
11%
23%
3%
3%
33%
27%

Larry Bettiga

Viticulture Farm Advisor

M.S., CSU Fresno

41 years with UCCE

The viticulture program focuses on extension education, applied research and problem diagnosis for wine grape growers in Monterey County.

Local research has been instrumental in helping the Monterey County wine grape industry achieve and maintain a reputation of being early adaptors of new technologies. This work has been done both independently by wine grape growers and in cooperation with county and campus based staff from the University of California Division of Agriculture and Natural Resources. The following examples will demonstrate how UCCE viticulture research conducted in the county has helped to provide answers to major production issues in vineyards.

Evaluation of vineyard practices to improve the sustainability and viability of wine grape production.

The goals of this area of research are to evaluate established and alternative vineyard cultural practices; and evaluate grape cultivar clonal selections and rootstocks for the potential to improve plant growth and yield to achieve fruit quality expectations for coastal wine grapes using research based knowledge to promote economic and environmental sustainability. Long term research has been conducted on one site to evaluate clonal selections of Riesling, and rootstock research on two sites. The sites have the recently released UC Davis rootstocks.

Nurseries are selling potted dormant benchgrafts with trunks pre-developed as a method to accelerate the vine establishment process. We have continued to evaluate this type of material compared to the standard type of benchgraft that is trained in either the first or second year and established six trials to determine the growth response of potted dormant versus green-growing plants and to further evaluate training strategies and the use of vine shelters to enhance earlier vine development.

Trials evaluating planting stock and training methods have developed information to demonstrate to growers the potential for reducing the time to achieve full production of vineyards with a reduction in training labor costs. In previous long-term evaluations of rootstocks on a winter cold-damage prone site UCCE was able to demonstrate the growth and yield suppression, and time of recovery differences for the major rootstocks currently being used. Observations from the current trial show that there is the potential for cold related damage with the UC Davis rootstocks and that growers in cold prone sites need to avoid using these rootstocks until more information is developed. These studies described above developed new information that was used by grape growers to improve economic sustainability. The extension of vineyard development practices has improved management decisions and growers that have adopted earlier vine training have achieved full production potential earlier in the life of their vineyards. The use of planting stock with pre-developed trunks has

Comparison of the effect of planting stock on the growth of grapevines at the end of the third year. Picture left is a dormant tall benchgraft versus a green-growing tall. Note the advanced development of the plant on the left that can result in higher cropping in the first production years.

UCCE research impacts local rootstock selections improving yields

increased locally based on the trials conducted that justified the use of this more expensive planting stock based on earlier plant development and higher initial yields. This work has also demonstrated the labor savings by planting vines with preformed trunks. The impact of this work becomes more obvious as the results serve as a basis for more informed planting decisions to improve yields and quality. The rootstock evaluations are providing a local database that is updated as new information is developed. The avoidance of rootstocks that are most susceptible to winter cold injury has helped recent developments to avoid the loss of profitability that can linger in vineyards in the southern part of the Salinas Valley and is one of the most significant impacts of the rootstock research on the central coast. The preliminary determination of cold damage susceptibility of some of the UC Davis rootstocks can help growers avoid the reoccurring losses in yield in future plantings.

Pest Management in Viticulture

Grape powdery mildew is the major problem of vineyards in Monterey County.

The goal is to identify and document pest issues of wine grape vineyards on the central coast; develop information on the biology of new and established pest issues; and devise management strategies to reduce impact from these pests. Fungicide evaluations have been conducted to measure efficacy of both registered and experimental materials for both powdery mildew and *Botrytis* bunch rot. In addition to evaluating low risk and biological fungicides, the demonstration of resistance management strategies is a key component of this fieldwork. To address vine decline issue, a study was conducted to evaluate planting procedures to reduce the incidence of losses due to fungal infections of the root systems of grapevines. For powdery mildew UCCE has developed data that will contribute to future grape fungicide registrations that will benefit growers. Results from planting technique studies have shown that limiting initial root length of benchgrafts at planting reduced initial growth in the first year after planting. The powdery mildew projects have changed grower practice in vineyards with extension efforts making growers more aware of the importance of application timing, material selection, and the use of resistance management strategies to improve disease control. UCCE has worked with local growers in the Salinas Valley to initially explore the formation of a cooperative pest control district to share mealybug trap catches and coordinate control practices between all growers in the county to reduce the impact of mealybug spread of leafroll virus. Currently, they are forming neighborhood groups to coordinate control practices to reduce mealybug spread of leafroll disease between adjacent vineyard properties and we are working closely with the local grower association to provide technical support to this areawide effort. Studies have also demonstrated how to reduce the potential for vine decline by trimming roots prior to planting to avoid “J”-rooting of vines at planting with limited loss of first year vine growth.

Trimming planting stock to reduce “j-rooting” of the roots during planting is being evaluated along with planting methods. Vines with “j-rooting” can have increased problems of poor growth and vine decline fungal infections such as black foot disease.

Richard Smith

Vegetable & Weed Sciences Farm Advisor

M.S., UC Davis

33 years with UCCE

This program addresses vegetable production issues such as cultural practices to improve nitrogen fertilizer use efficiency. Nitrate is a form of nitrogen fertilizer used by growers, but can contaminate drinking water wells that are used by municipalities if it is leached beyond the rootzone and down to the ground water. Nitrate leaching occurs when excess quantities of nitrogen fertilizer are applied to vegetable production fields and/or when excess irrigation water is applied. Since 2014 growers are required to report the quantities of nitrogen fertilizer utilized on their farms to the Central Coast Regional Water Quality Control Board (CCRWQCB) and they are under increasing pressure to manage nitrogen fertilizer applications more efficiently.

In addition, this program addresses weed control research and education. Weeds control in vegetable production fields is a critical cultural practice carried out by growers to assure successful and profitable crop production. It is critical to continue to evaluate new techniques and equipment to help maintain the competitive ability of Monterey County growers. An increasing issue for growers is the availability of workers to weed vegetable production fields.

Nitrogen Management

Nitrogen fertilizer research is conducted with cooperating growers. Nitrogen research projects include evaluation of nitrogen uptake of key vegetables that are at risk in the current regulations posed by the CCRWQCB. Research includes evaluating nitrogen uptake dynamics of vegetables, impact of residual soil nitrate on crop growth, and use of fertilizer technologies to improve nitrogen use efficiency. The fall is a key time of year that nitrate leaching occurs and we are conducting a project examining the use of high carbon containing composts to help tie-up residual nitrate in the soil and keep it from leaching. Nitrogen management in organic production is also important because it comprises 9.7% of the total value of agriculture in Monterey County and is an important part of the business of every vegetable production company. In order to help the organic industry address water quality regulations and help growers more effectively manage nitrogen fertilization issues, we conducted a multi-year evaluation of the fertility dynamics in organic vegetable production.

High carbon compost being applied to large scale field trial.

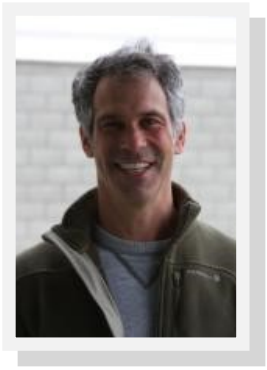
Weed Management

Mechanization addresses labor shortages

Automated machines are now routinely utilized by growers in the Salinas Valley to both thin as well as weed lettuce. These machines are being utilized by growers to address labor shortages and improve crop production practices in the valley. We are conducting research to optimize the efficiency of automated thinners. Some of these machines use a spray "kill mechanism" to remove the unwanted plants and we have been evaluating materials to improve the efficiency of this operation. In addition, we are evaluating techniques to improve the ability of the machines to distinguish weed plants from crop plants. This research program has facilitated the development of the most efficient spray materials to help automated thinners operate effectively. UCCE research program has help bridge the needs of both the technology companies providing the automated thinners and weeders with the growers. Given the labor shortage, these technologies are helping growers cope and maintain productivity.

Automated weeding platform being demonstrated to growers at the Automate Technology field day in May 2019.

Michael Cahn



Irrigation and Water Resource Management Farm Advisor

PhD, Cornell University

24 years with UCCE

The UCCE Irrigation and water resource program conducts research and education programs to promote agricultural stewardship of ground and surface water supplies in Monterey County. Agriculture is the main user of ground water in Monterey County. Identifying practices that can assist growers in using water more efficiently can have a large impact on the sustainability of water resources in the Monterey Bay region. In addition, run-off from farmland during storm and irrigation events can degrade the quality of surface and ground water supplies. Through grant funding support of more than $500,000 during the last 2 years we have been able to greatly increase research and outreach activities to improve the efficient use of water by agriculture and to protect water quality. The following highlights a few of these projects.

Best management practices remove pesticides in irrigation runoff

Irrigation run-off from agricultural fields can carry sediments, pesticides, and nutrients that degrade the quality of water in creeks, rivers and estuaries. Even small quantities of pyrethroid and neonicotinoid pesticides lost in runoff from agricultural fields can harm the native aquatic organisms downstream. UCCE developed and tested an array of strategies that growers can implement on their farms to remove pesticides in irrigation runoff. Using a combination of sediment traps, vegetated ditches, biochar and compost filled construction socks, as much as 99% of these pesticides can be removed from run-off and eliminate potential toxicity.

UCCE develops methods to reduce pesticide run-off

Vegetative treatment systems can remove pesticides in agricultural run-off.

Irrigation water nitrate credits

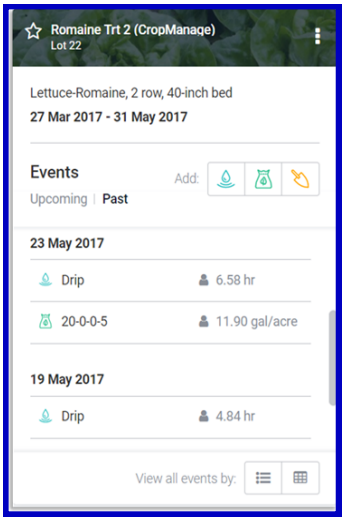
UCCE educates on how to reduce fertilizer nitrogen by as much as 70%

Crediting nitrate in irrigation water saves on fertilizers and minimizes contamination of groundwater. A large portion of the agriculture wells in the Salinas Valley have nitrate concentrations greater than the drinking water standard of 10 ppm nitrate-N. A 3-year trial demonstrated how growers can credit the background levels of nitrate in irrigation water and reduce the fertilizer inputs to their crops. On-farm demonstrations confirmed that when wells are high in nitrate growers can reduce fertilizer nitrogen applications by as much as 70% and still attain their normal production.

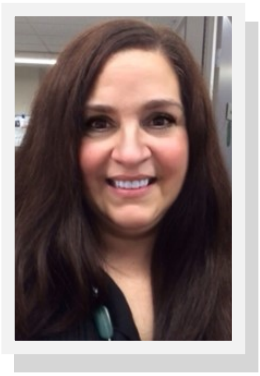
Replicated field trials demonstrated that nitrate in irrigation water can offset a portion of the fertilizer needed to produce vegetable crops.

Best management practices remove pesticides in irrigation runoff

Efficiently using water and nitrogen fertilizer to grow crops is critical to conserving ground water and protecting water quality. This region has always been a hub of innovation. Following this tradition UCCE developed an online decision support tool, know as CropManage, to help growers better determine the water and nitrogen needs of their crops using local weather information and crop models. The online tool continues to be improved and expanded to include a wider array of commodities produced in Monterey County, including broccoli, cauliflower, cabbage, celery, raspberry, and strawberry. Growers can access CropManage (cropmanage.ucanr.edu) from their smart phones or their office computer and determine how much water to apply to their fields in seconds. They can also determine how much nitrogen fertilizer to apply using a field soil tests and crop uptake models. CropManage provided growers with more than 1500 recommendations per month on water and fertilizer management during the peak of the growing season.



Maria de la Fuente



County Director, Farm & Master Gardener Advisor

PhD, Plant Pathology, Iowa State University

23 years with UCCE

UCCE maintains partnerships with governmental organizations, agencies and private industry.

Dr. de la Fuente's programmatic efforts depend tightly upon increasing science literacy in agriculture to improve the competitiveness and productivity of the industry while supporting the sustainability of small farms and minority growers. Some of the particular projects of focus for the past two years are;

Leadership in California's Agriculture

With a dual role as ANR UCCE County Director and Monterey County Department Head she makes sure that exposition and visibility of UCCE programs and the expertise we bring is used to develop diverse and Latino communities. She collaborates with Monterey County Ag Commissioner and the Center for Community Advocacy in their Farmworker Advisory Committee, and the ANR 4-H Youth Development Program Latino Initiative.

UCCE cultivates and strengthen relationships and networking to foster partnerships and increase our visibility, to secure grants, contracts and donations, maintain county budget, keep office space, and provide support for all the programs under my leadership. She participates in bi-weekly Department Heads' Meetings, some BOS meetings where County concerns, budgetary issues, County ordinances, safety issues, performance evaluation systems, strategic initiatives, etc. are discussed.

She also represents UCCE in Monterey County Farm Bureau (FB) monthly meetings, and in all ANR Leadership & County Director's Meetings and Conference calls, to make sure that ANR vision is projected, Dr. de la Fuente strengthens relationships with fellow CDs and learn of administrative and programmatic issues for all programs. In our office we conduct monthly staff meetings and 2 - 3 annual all staff meetings. Using her expertise in working with Hispanic communities she contributes to the ANR Diversity Workgroup and collaborates in a project Building & Sustaining Engagement with Diverse Audiences. We are adapting methods commonly used for reaching underserved minority Hispanic growers/ operators to translate in the appeal for Hispanic parents and kids and increase their enrollment in the 4-H Program. UCCE Monterey is one of the 7 Counties in the ANR Pilot Program 4-H YD Latino Initiative.

UCCE has "The UCCE Monterey County Wall of Fame", posting cuttings of newspaper and magazine articles where authors quote or showcase the work of our advisors. From 2017 to 2019 we provided 10 agricultural presentations and tours to national and international visitors from University of North Carolina, Universidad Autónoma de Chapingo MX, Consulate General of the Peoples Republic of China, Gyenguu-do Agricultural Research of Republic of Korea, Universidad Popular Autónoma de Puebla MX, UC Davis Student Organic Seed Symposium, Food & Machine Corporation (FMC) & Scientist from Australia, US Research Center Administrative Society Directors, and French National Institute for Agricultural Research (INRA). All these helps the world to know about our agriculture.

UCCE & UCNFA Collaborating with Nursery and Floricultural Industry

In 2018 Monterey County Nursery Production value was $204,289,000 and Floriculture $11,305,000

Our mission is to provide technical help and education to owners and operators of Nurseries. The UC Nursery and Floriculture Alliance, has an extensive network that provides research and extension services statewide. We also collaborate with the Ag Commissioners in preventing the introduction and spread of agricultural pests through nursery stock and protect all other agricultural enterprises and the consumer against economic losses resulting from the sale of inferior, defective, or pest -infested stock.

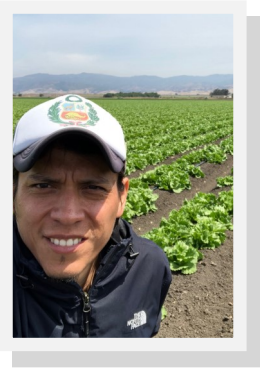
Both industries are the largest component in US Agriculture, with the California combined farm value fluctuating between $3.5 to $4.5 Billion a year. The total output of nursery and floricultural producers combined brings them every year in second place among all California agricultural industries, just after dairy. They both tie to the real estate industry because their unique crops are indispensable for the landscaping and aesthetic portion of properties and infrastructures, making California the largest single market for lawn and garden products in the United States.

UCCE, UCNFA and the Ag Commissioner offices get support from CDFA Nursery Services, providing a list and directory of all California licensed Nurseries, by county. Consumers can search by license number, county, city, type of business and type of stock. They list producers and retailers, totaling 12,168 in California. Growers produce commodities such as cut flowers, coniferous and broad-leaf evergreens, deciduous shrubs, roses, herbaceous ornamentals, bulbs, corms, rhizomes, pips, decorative plants, cacti, succulents, deciduous fruit and nut trees, grape and kiwi vines, citrus, tropical/ subtropical fruit trees, berries, palms, vegetables, groundcover and sod/turfgrass. We all have to pay attention to production techniques, cultural practices and impacts on environment to protect water, air and soil quality. All the ancillary businesses that serve these producers, such as compost, potting mixes, fertilizers, pesticides, incidental retailers, jobber merchants, and landscapers, have to be educated and guided to do their part in making sure that we keep a livable and beautiful California for all.

In the tri-County Area there are 392 businesses that are nursery producers or retailers, where inspections need to be conducted to prevent introduction and or spread of invasive pests and diseases, and to prevent the endemic ones. The growers and operators of the nurseries also need to complete continuing education credits in order to be able to apply pesticides, and need to be educated on water and irrigation issues, controlled environment situations, best management practices, equipment/technology to improve operations, horticultural related issues like botany and physiology, IPM, nutrient & fertilizer management.

This term Dr. de la Fuente delivered 77 workshops providing 541 hours of training reaching 2,045 growers, owners or operators of nurseries with 1,861 Hispanic participants attending her presentations in Spanish.

Alejandro Del-Pozo



Entomology IPM Farm Advisor

PhD, Entomology, North Carolina State University

1.5 years with UCCE

Dr. Del-Pozo's Entomology program conducts applied research under both commercial (in-field) and laboratory conditions addressing pest issues in vegetables crops grown in Monterey County. Additionally, the program extends science-based information on pest management tactics to all growers, stakeholders and community members in the County through sample identifications, blog postings and open-to-the-public seminars. The ultimate goal of the Entomology program is to provide information and support on how to implement and improve an Integrated Pest Management (IPM) program in vegetable crops, such as in lettuce, broccoli, or cauliflower. The main research areas for the Entomology program include: 1) biology and life history of the most economically relevant pests, 2) area-wide monitoring of the fluctuation of pest population densities, 3) insecticide product stewardship, and 4) biological control.

Research on most economically relevant pests

Identifying known enemies and understanding their biology and life history is a key focus of the Entomology program. Arthropods, including insects, may cause significant economic losses when feeding in large numbers on agricultural crops. It is important to understand how these pests develop and how much plant injury can be generated by their feeding over time. Growing aphids, little pear-shaped soft body insects, under warm (77° F ± 5°) and controlled conditions showed that they were able to complete a generation (from immature to adult) in one week, feeding on Romaine lettuce. The amount of injury recorded on those host plants was unprecedented. Any control tactic to manage aphids in lettuce would require to be deployed within a week of the first detection of these insects to avoid the generation of subsequent progeny.

Aphid damaged lettuce on left vs. healthy lettuce on right.

Area-wide monitoring and alerting growers

The Entomology program actively monitors and alerts growers on pest populations. Fluctuations on some pest populations can be tracked down using different monitoring traps. Currently in Monterey County, we have sex pheromone baited traps capturing the diamondback moth, paired with yellow sticky cards capturing aphids and thrips. Weekly captures are shared with participant growers and are publicly available through our blog. Information from these captures alerts growers on pest densities across different areas in Monterey County. Automated sex pheromone traps are also being tried out, as part of this pest monitoring network These automated traps take daily pictures, and then recognize and count the adults captured using a computer software and machine learning. Automated traps transmit daily moth captures and reduce the labor costs for checking and cleaning these traps.

Automated pheromone

Insecticide product stewardship; widening the toolbox

UCCE tests efficacy and application timings

IPM implies the use of several control tactics to manage pests in a crop. Growers are constantly facing economically relevant pest densities growing vegetables. Therefore, and quite often, the use of insecticides, both organic and conventional, is needed to reduce pest pressure and avoid potential losses. This project is currently testing the performance and application timing in the field of several insecticide active ingredients, both organic and conventional, to control pests in vegetables including aphids in lettuce. Replicated efficacy trials have been conducted in several locations to gather data and inform growers on the performance of these different insecticides. Rotation, using multiple active ingredients within a growing season, of efficacious insecticides will delay any potential development of insecticide resistance on vegetable pests.

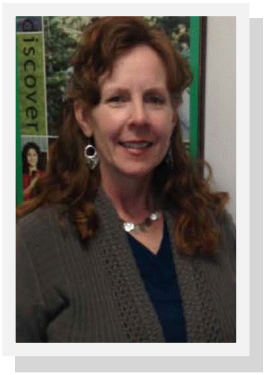
Biological Controls

Alyssum planted in Romaine Lettuce field near Chualar, Ca.

The use of natural enemies of pests, is a crucial pillar for establishing an IPM program. Organic growers are currently using flowering insectary plants to attract and promote the presence of naturally occurring beneficial insects, the 'good guys', in their fields. Significant lower numbers of aphids were found in organic Romaine lettuce fields inter-planted with the flower alyssum, compared to field with no alyssum flowers at all during 2018. Alyssum flowers attract hoverflies, a type of aphid predator, by providing pollen as food and an alternative habitat as shelter. Besides the use of insectary plants, another research project is to release laboratory-reared beneficials to control pests in vegetables. Augmenting the presence of beneficials in the field might ultimately result in reducing pest populations. In our case, we have conducted research trials releasing beneficials to control aphids in Romaine lettuce. To reduce labor costs and improve the application timing, the release of beneficials was done by drone. Accessible drone technology and data from these trials will inform growers on the performance of these released beneficials on controlling aphids in lettuce.

Drone releasing beneficial insect predators of aphids on organic Romaine lettuce near Soledad, CA.

Lorin Hofmann-Lurz



Youth Development Community Educator Specialist

7 years with UCCE

The mission of the 4-H Youth Development Program is to instill leadership, citizenship, and life skills in our youth through hands-on learning and community service. In Monterey County there are 15 community clubs serving young people ages 5 through 19. The content of the 4-H program focuses on science, engineering and technology; healthy living; and citizenship. Volunteers keep the tradition of animal husbandry, mechanics and home arts alive.

Building Youth Leaders

Providing Youth Leadership opportunities is at the core of the mission of the youth development program. A Youth Council was formed to serve the interests of the youth membership in addition to the Leader's Council run by adult volunteers. Led by 4-H alumni, this leadership team is open to teen members of all 15 clubs. Designed for the "doer," members actively take part in Council sponsored events and activities. Meetings are held monthly, and they are a part of the monthly Leader's Council agenda with their own reports.

High school teens continue to travel to state-wide leadership conferences held at UC campuses as delegates. Middle school members attended regional leadership conferences as well. Both Washington D.C. conferences for middle school and high school have had Monterey county delegates representing our community. All these members bring back new ideas and enthusiasm for the club and county program. Funding for these conferences vary from club supported, to Council supported to inviting the community to aid in sponsoring their registration and travel fees.

4-H Youth Summer Camp

Camp McCandless, the 4-H overnight summer camp program, invites 30 teens to apply for a teen counselor position who then train and prepare over 5 months for this traditional overnight camp. As part of this leadership program, these teens take part in monthly training that delves into being positive mentors for young members, leadership skills, personal safety and emotional well-being. Each counselor sets personal goals as a leader and is evaluated at the end of the Camp as part of the growth process. Funding for this program comes from the campers fees, donors and from small annual fundraisers.

Youth Council meetings are held monthly.

Carmel Valley forms a New Club

New officers at the Carmel Valley club are installed inside the Trail and Saddle Club.

As of December 2018, the Carmel Valley Club returned to serve youth after a 5-year haitus. Their membership was formed through members from Salinas area clubs and it continues to grow. Their opening meeting included members of the local Kiwanis and the installation of officers was conducted by Superior Court Judge Carrie Panetta.

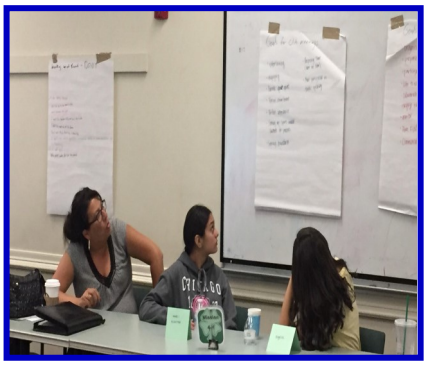
Promoting Volunteerism

Parents, guardians and adults are a vital part of the Youth Development Program. Over 350 adult volunteers support the members through a variety of positions. Training with accurate and up-to-date information is offered through the county offices and by other volunteers.

Over 350 adult volunteers support the 4-H Youth Development Program

Funding for the local program continues to be driven by the 4-H Leader's Council - the non-profit entity that supports the program. Major fundraisers such as the 4-H Food booth at the Monterey County Fair and the Color Me Green run which takes place in March, offer "sponsorships" by community businesses. Additional program fees are added to each member's enrollment to offset ongoing budget shortfalls. The Council's funding committee continues to seek possible ideas and alternatives that require a smaller burden on the overall membership. Each club conducts its own yearly fundraiser to reach its operating needs.

The Leader's Council recognizes the need to invite new volunteers and members from within the community from a variety of backgrounds to keep the program moving forward. Long standing supporters and stakeholders from the community show their support in a variety of ways.

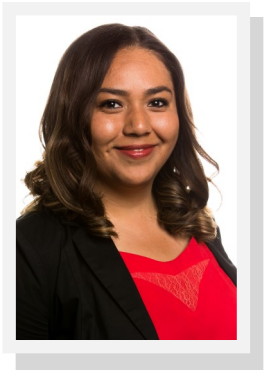


Youth members learn with volunteers he importance of the Youth—Adult Partnership model.

Facilitating Trainings

Numerous county wide trainings have become available to both adult volunteers and members who want more information of the guiding principles of the program. Structured socializing among the Club Leaders creates a strong adult leadership team for clubs. Each year, an Officer Advisor training takes place during the summer to prepare the adults to coach the youth to their fullest potential. They in turn, hold a summer officer training at the club level to prepare members to lead youth governance and decision making.

Darlene Ruiz



Community Educator Specialist

1.5 years with UCCE

4-H exposes youth to cultural learning

The UCCE Monterey County 4-H Program has been part of a 3-year grant funded multicounty pilot program in the state of California that started in 2016 and is set to end in 2019. Darlene Ruiz joined the Monterey County 4-H Program in late 2017 as the Program Representative for Diversity and Expansion. Her primary focus has been engaging with the community through outreach events and partnering with other youth serving organizations. Between November 2017 through July 2019 over 740 youth of which the majority are Latino, have been reached through these efforts. Community events at which 4-H conducted outreach and provided short activities included: Ciclovia, ALBA Family Farm Days, Dia del Niño, YMCA Healthy Kids Day, NASA Family Cafe, Monterey Bay Family Fun Expo, Monterey County Fair, EDEN Housing community meetings, Color Me Green Run & Spring Fest, National Night Out and the Monterey County Farm Days (Salinas, King City, and Monterey). Thanks to support and sponsorship from CA 4-H, Monterey County youth had the opportunity to attend conferences such as the Youth Summit, California Focus Conference, State Leadership Conference, and the Oregon Youth Voices in Action Leadership Institute.

Expanded Learning and Afterschool Programs

New collaborations were accomplished by having afterschool personnel deliver 4-H curriculum; with a heavy emphasis in STEM (Science, Technology, Engineering & Mathematics), leadership, and college and career readiness. For example, Chualar Elementary school incorporated “¡Que Rico! La Cultura” into one of their afterschool days and kids benefitted by getting in touch with their culture and becoming more open to others. Partnering with Seaside Middle School, California State University Monterey Bay (CSUMB), and the Dual Language Academy of the Monterey Peninsula (DLAMP) has allowed Monterey County 4-H to expand geographically. CSUMB college students volunteered to lead projects at these school sites. DLAMP provided a 4-H Robotics club and 4-H Teen Corps program for those interested in learning about resumes, interviews, and entrepreneurship. Furthermore, with the assistance of 4-H, DLAMP hosted their very first Career Day in which various other community partners presented and provided students with an in depth look into different career options. A successful partnership between 4-H and EDEN Housing (which provides affordable housing to low income families) was also established. By means of their *expanded learning program*, youth in Marina and Camphora participated in 4-H projects such as Computer Science and Acres of Adventures, which explores Agriculture through a STEAM (Science, Technology, Engineering, Arts & Mathematics) lens. EDEN Housing in conjunction with 4-H and Catholic Charities also worked together to launch a Summer Youth Race to promote healthy living. This relay race consisted of 7 stations in which participants had to complete an activity to move ahead. Healthy snacks, prizes, and a smoothie bike were part of the event to encourage family participation.

4-H Juntos Program

Juntos, meaning 'together' in Spanish, helps Latino youth (grades 8-12) and their families gain the knowledge and skills they need to bridge the gap between high school and higher education. The 4 objectives are to 1) Increase family engagement that leads to student's educational success; 2) Increase the sense of belonging among Latino students and families in their schools and communities; 3) Increase Latino student success by improving student attendance and grades, and achieving high school graduation,;4) Increase the percentage of Latino students attending higher education. Seaside High School piloted Juntos for Monterey County for 8th grade families. 20 families participated in the 2018-2019 cohort where they were assigned a college mentor, and attended Family Engagement Workshops, afterschool activities, and completed a summer component. The afterschool club offered Career Exploration and a Photovoice project. The summer component options included a tour of CSUMB and the *Juntos* Summer Academy hosted by the Statewide 4-H program (overnight 3 day stay at UC Merced offering workshops and an immersive experience about what to expect in college). Overall, *Juntos* has made a tremendous impact on the Monterey County families, who were very grateful for the unique experience.

Teens as Teachers

Teens as Teachers (TAT) uses curriculum written for middle and high school students to easily understand and have the capacity to facilitate lessons. Teens become equipped with the confidence and tools to become positive role models in the community while gaining work experience, community service hours, and public speaking skills. Life is for Everyone (L.I.F.E) and the Cesar Chavez Library offered the teen teacher program afterschool on Fridays. The teens and staff attended an all-day training and then high school teens facilitated the lessons for youth between 3-5 grade. Through the "Youth Experiences in Science" TAT curriculum youth participants learned about different types of energy (chemical, sound, physical, etc) by using their 5 senses and also learned about recycling and being conscious of the environment. The sites reported that the kids enjoyed the projects and what they were learning. The kids grew more attentive and looked forward to the Friday activities. They progressively grasped concepts more quickly and needed less probing questions from the facilitators. Not only were they more interested in science, but they became more self-aware about their responsibilities and increased their sense of contribution. Other skills the youth practiced and improved on included teamwork, sharing, and taking turns communicating.

Royce Larsen

Area Natural Resource Watershed Advisor

PhD. Oregon State University

25 years with UCCE

There are over one million acres of native pastures in Monterey 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. UCCE advisors and specialists apply research to develop new knowledge to effectively and efficiently manage rangelands and livestock in today's competitive environment and regulatory environment. Dr. Larson was on sabbatical leave, January 1, 2018 through December 31, 2018, during the time of this report.

Efforts in Maintaining Sustainable Ranching

Much of the program work on the California Central Coast has been in helping land owners and managers improve range management while maintaining a sustainable ranching enterprise. During the last severe drought on the Central Coast, many found it difficult to maintain cattle herds because their forage to feed livestock was greatly reduced. Also, forage species composition changes created a challenge for ranchers to have forage with adequate nutrients for their livestock, as well as wildlife. There has also been increase of unpalatable weedy species invading rangelands in California, as well as rangelands across the whole western US. The ranching industry in the Central Coast is a very important part of the economy and wellbeing of the citizens that live and work here. Providing information of improved forage species for production, improved nutrient quality, and plant species that can compete with weedy invasive species is important to the ranchers and land managers of rangelands.

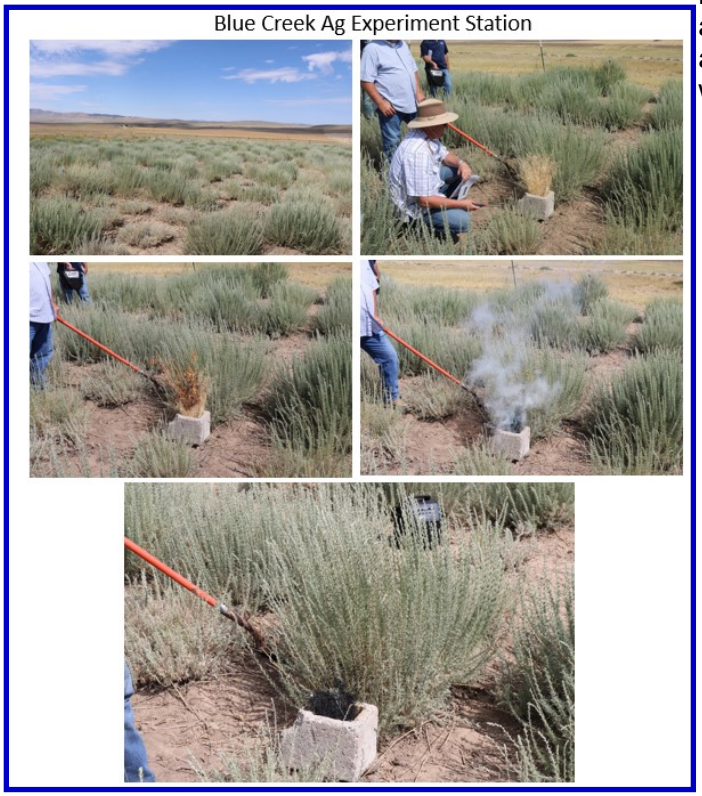


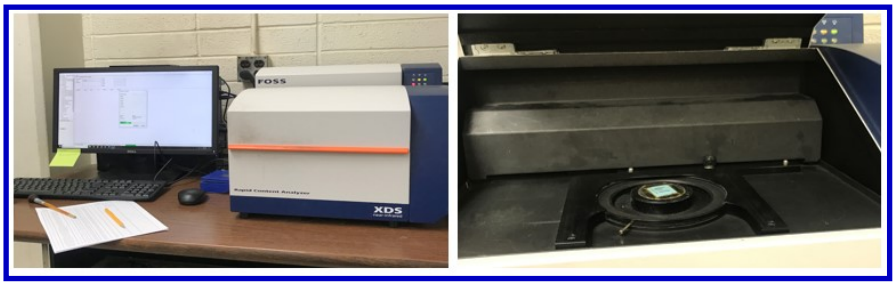
Figure 1. A field day at the Blue Creek Experiment station. shows a planting of forage kochia, a small shrub that is highly nutritious and palatable to livestock and wildlife. This plant grows well in 6" – 16" rainfall zone. Forage kochia is not a weedy species, but it is a plant species that stays green long into the summer and is very fire resistant. If this plant will grow in California, it could have a huge benefit to not only improve forage values for livestock and wildlife, but also to help preventing the spread of wildfires.

Dr. Larsen had the opportunity to work with the FRR to learn about their new improved varieties of perennial grasses, forbs and shrubs they are currently testing. One plant species of great interest that Dr Larsen learned about was that of forage kochia (*Bassia prostrata*). This is a small perennial shrub that has excellent forage quality for wildlife, as well as livestock. Forage kochia is very fire resistant, and an important plant to create fire breaks in strategic locations on rangelands. The fire resistance was demonstrated at a field day at the Blue Creek Ag Experiment Station, see figure 1. For the future, UCCE plans to do a seeding trial to determine if it will do well in our California Annual Rangelands.

Continuing Peak Forage Production Project

UCCE has continued work on forage production research, now having 4 monitoring locations in Monterey County, in addition to the sites in San Luis Obispo and Santa Barbara Counties. These sites were set up while working with Advisor Devii Rao, who also covers Monterey County as the Livestock and Range Advisor. These sites are used to determine forage production, especially forage loss during droughts. This information is given to the USDA FSA and Agricultural Commissioner to help ranchers get the needed payments for forage losses during droughts.

During his sabbatical Dr. Larsen was able to work with the USDA ARS lab at Utah State University, and use their Near Infrared Reflectance Spectroscopy (NIRS) to determine various nutrient content of forages including crude protein (CP), acid detergent fiber (ADF), digestible neutral detergent fine (dNDF48), and water-soluble carbohydrates (WSC), Mg, P, K, Lignin, Fat and Starch using the NIRS consortium equations. Use of this USDA ARS lab has continued and analysis of the 2019 samples is underway. This information will be useful to ranchers to help determine what supplements are needed to help keep their herds healthy and productive.



Near infrared reflectance spectroscopy (NIRS) instrument, Model 6500. Near infrared wave length scans are used to predict crude protein (CP), acid detergent fiber (ADF), digestible neutral detergent fine (dNDF48), and water-soluble carbohydrates (WSC) using the NIRS consortium equations.

Mark Bolda

Strawberries & Caneberries Farm Advisor

M.S. Plant Protection and Pest Management, UC Davis

16 years with UCCE

The strawberry and caneberry (raspberries and blackberries) program is based in Santa Cruz County, but also serves the large grower community of these commodities in Monterey County. This program consists of traditional agricultural extension (including the massively popular annual strawberry production research meeting), more contemporary extension through the use of blogs in both Spanish and English, and an effective agenda of research and investigation of problems in these important crops. Current areas of research include enhancing yield and post-harvest quality of winter strawberry production through fertility management and fungal control, investigations into the cost of production of caneberries and strawberries (including the recently introduced primocane bearing blackberries and organic strawberries), investigating sound management alternatives for existing and invasive pests, all while being on the alert for pressing issues arising from the transition from methyl bromide to alternative soil fumigants.

Primocane blackberries.

Pest Management for Berries

The strawberry and caneberry program has been very much involved in research and extension of two major pests of berries on the Central Coast: light brown apple moth (LBAM) and spotted wing drosophila (SWD). For LBAM, the UCCE developed program of judicious sprays on discovery of the pest, continuous use of mating disruption through pheromones along with destruction of discovered leafrolls. This has resulted in fewer regulatory field closures than when this pest was first discovered in berries in 2008. Information continually extended to the grower community through formal meetings, distribution of written and pictorial material and in person meetings on the farm. Likewise with SWD, the UCCE developed a program on insecticide sprays and field sanitation and has turned a nearly unmanageable situation from this invasive insect to one which growers have been able to deploy successfully and quickly. Once again, the continual extension of information to growers and pest managers was through formal meetings, distribution of written and pictorial material and in person meetings on the farm.

Identifying LBAM larva in strawberries.

Methyl Bromide Alternatives

UCCE leads the way in researched based solutions to regulatory changes.

Investigations for solutions for berry growers in the post methyl bromide fumigation period have continued. In particular, fumigation alternative focus in over the past period was to test the efficacy of "crop termination" which has shown promise in reducing the overall pathogen load, especially in the case of the rapidly spreading soil pathogen *Fusarium.* Tests to date of crop termination done in 2016, 2017, and then in 2018 have shown a lot of promise, with significant yield improvement of multiple strawberry varieties and even in some cases close to the grower standard, all while offering a better environmental profile than some of the other traditional fumigants.

Another part of the effort of successfully moving agriculture into adopting methyl bromide alternatives and maximizing their effectiveness is to adapt the crop culture to them by modifying nitrogen nutrition and soil temperatures by plastic cover color. This consisted of maintenance of large one acre research plots with 16 treatments and a wide variety of parameters, from soil nitrogen levels to fruit yield.

Experimenting with different plastic colors. Left is silver and right is green.

Devii Rao

Area Livestock and Natural Resources Advisor

M.S. UC Berkeley

5 years with UCCE

The Livestock and Natural Resources program focuses on science and education related to economic and ecological sustainability of ranching in Monterey County. At over one million acres in Monterey County, rangeland is valued at $19.1 million dollars and cattle for beef $75 million. The program aims to help ranchers maintain economic viability through challenges such as drought and increased regulation, as well as balance business operations with preservation of water quality, local ecosystems, and food safety. The Beef Quality Assurance Program is an example of how UCCE can work with the livestock industry to help keep ranchers up to date on how to raise cattle responsibly and ensure safe, wholesome, and healthy beef.

Promoting Economic Prosperity

UCCE partnered with a local ranchers to conduct a cost and return study. Understanding ranching economics is critical for anyone involved with livestock. We conducted a cost and return study on the Central Coast for a 30 head cow/calf operation. This study is valuable for ranchers because it will help them think through the various categories of costs and aid in developing a budget and business plan. Land management agencies will benefit from understanding the timeline for breeding, branding, vaccinating, calving, shipping, etc. This study will help ranchers and agencies make more informed economic and ecological management decisions.

Cows and calves on rangeland.

Protecting Natural Resources and Rangeland

Increasing ecological sustainability is an important goal of UCCE. The Livestock and Range program is working with local landowners and agencies to bring prescribed fire back to the community. Prescribed fire can be used to reduce fire fuels and control invasive weeds. UCCE recently coordinated a prescribed burn as the first phase to control yellow starthistle on a ranch in Bitterwater. Yellow starthistle is one of the most serious rangeland, grassland, and wildland weeds impacting native plant diversity, altering water cycles, and poisoning livestock. In addition to controlling yellow starthistle, this burn provided an opportunity for ranchers and other local people to get hands-on training in using Phase 2 will include a follow-up treatment with herbicide, along with seeding to increase pollinator habitat, and prescribed grazing.

Ranchers and community members learning how to use hand tools.

Lighting a prescribed fire.

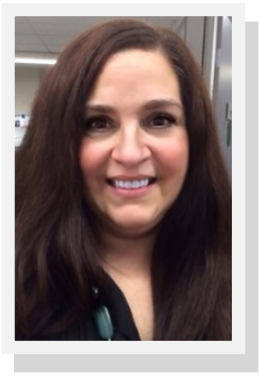
Utilization of Targeting Grazing


University of California
Agriculture and Natural Resources

PROFILES OF CALIFORNIA BRUSH
Targeted Grazing to Reduce Fire Fuel Loads in California Chaparral Series Part 1

Targeted grazing/ browsing is another tool used to control weeds and reduce fire fuels. This is a strategy where livestock are used at a specific time and location to achieve a defined management goal. Goats and sheep are often used to manage brush species. However, some brush species can be poisonous to livestock. The Livestock and Range program, along with UC academics from across the state, developed a publication to aid livestock producers in understanding which species are toxic, signs of intoxication, treatments, and grazing management recommendations. This is a useful tool for people who have a targeted grazing business or people who are using their own animals to control brush on their properties.

Maria de la Fuente



County Director, Farm & Master Gardener Advisor

PhD, Plant Pathology, Iowa State University

23 years with UCCE

Master Gardener Volunteers are Agents of the University of California.

The mission of the UC Master Gardener program is "To extend research-based knowledge and information on home horticulture, pest management and sustainable practices to the residents of California."

UC Master Gardeners Monterey & Santa Cruz Counties

IN OUR COMMUNITIES

Together, we are growing healthier gardens and more sustainable landscapes for future generations. From its humble 1980 beginnings in Sacramento and Riverside Counties, the UC Master Gardener Program has grown to serve 52 counties, from California's coastline to its mountains in the east. By customizing our local gardening outreach to account for unique local landscapes and the diversity of California's residents, we strive to meet the needs of all the communities we serve.

CORE VALUES

The core values of UC Agriculture and Natural Resources (UC ANR) are the principles that guide our actions. To deliver on the mission of the UC Master Gardener Program, we support an organizational culture that is committed to:

- Excellence
- Community
- Innovation
- Inclusion
- Collaboration
- Integrity

STRATEGIC INITIATIVES

UC ANR supports people and programs who use the power of science to create practical solutions that address major challenges in our state. As a statewide program within UC ANR, the UC Master Gardener Program has an important role to play in helping California thrive. The UC Master Gardener Program contributes to the strategic initiatives that guide all UC ANR programs by 1) supporting and encouraging **sustainable natural ecosystems** through landscape practices such as water conservation, water quality maintenance, green waste reduction and reuse, wildlife enhancement and energy conservation; 2) enhancing local **sustainable food systems** for families, neighborhoods and communities; 3) **detecting and managing invasive and endemic species,** as well as preventing their introduction, through education; 4) **supporting healthy families and communities** through science literacy and outdoor activity; 5) **safeguarding water quality, quantity and security** by reducing unnecessary pesticide use, promoting integrated pest management strategies and encouraging efficient water use.

BY THE NUMBERS

In 2017-2019, **146** UC Master Gardener volunteers in Monterey County donated **17,168** hours of their time, instructing communities in proven home-gardening practices, and gained **3,895** continuing education hours. The incredible work and knowledge of UC Master Gardener volunteers touched thousands of demonstration, community and school gardens across Monterey, Santa Cruz and San Benito Counties; they have contacted and interacted with **7,148** residents. Some of the most outstanding projects, are highlighted as follows:

Common Roots Farm (Costanoa Commons Farm)

Located in 335 Golf Club Drive, Santa Cruz, this is a small organic farm owned by a group of parents with challenged adult children wanting to establish a sustainable living center for their children. They opened their facility and garden to our MG educational programs, and helped us provide an outreach to the larger community. About 14 volunteers provided 202 hours of outreach and educational service to the family and 74 members of the community.

More information can be found on Common Roots Farm at https: commonrootsfarm.org/

Santa Cruz Community Garden Outreach

Located at 251 Lighthouse Avenue, Santa Cruz, it is a small lot at the end of Phelan Court that was donated to the City after the land was developed into housing. The 18 plots of rented gardens are tended by local neighborhood gardeners. It's a warm sunny location and many of the gardeners are growing corn, tomatoes, beans, carrots, cucumbers, peppers, chard, eggplant, herbs, pumpkins and so much more. 5 MG volunteers, 3 local and one visiting gardeners teach fall/ winter gardening, answer questions, and provide resources for information via our public information booths.

San Juan Bautista State Historic Park

Located at 2nd and Mariposa Streets, San Juan Bautista, CA, is a place where we conduct monthly public information booths and community outreach, as well as teaching the public gardening classes, such as taking care of succulents, inviting bees into your garden, bee-wise beekeeping, basics of rose care, herbs in the garden, and many more. In these instances a group of 24 volunteers educated 123 community members.

Rancho Cielo Teaching and Demonstration Garden

Located at the Rancho Cielo Youth Campus at 710 Old Stage Road, Salinas, it is a beautiful garden used as a teaching tool/outdoor classroom for the Drummond Culinary Academy, the new Ted Taylor Agricultural Center and the Monterey County Office of Education's Silver Star program. The garden hosts Family Fun Day every August, is maintained on a regular basis by 5 volunteers with some more joining as needed, which provided more than 2,190 hours of education and service reaching 1,937 members of the community. The garden has yielded more than 5,000 pounds of produce, and the program donated 1,000 pounds of harvested vegetables to Dorothy Kitchen in Salinas and 1,965 pounds to the Academy Kitchen in Rancho Cielo.

Master Gardeners donated more than 5,000 pounds of produce from their gardens

Smart Gardening Fair

The Smart Gardening Fair at Jewell Park Pacific Grove, it is a yearly event that includes a fundraising plant sale and teaching, Master Gardener demonstrations on gardening techniques and tools, guest speakers, vendors and a marketplace. 76 volunteers put this event together, work on it and volunteered 1,733 hours for this amazing event, and achieved about 350 contacts with members of our communities.

Plant Propagation and Plant Sales

The MG program takes advantage of the infrastructure of UCCE Monterey County, at the greenhouse and shade-house on 1432 Abbott Street in Salinas. In this project, about 42 volunteers propagate plants here and at home and then bring them to the plant sales or fund raising events. They logged in 1,131 hours of service, and had about 200 contacts with members of the community.

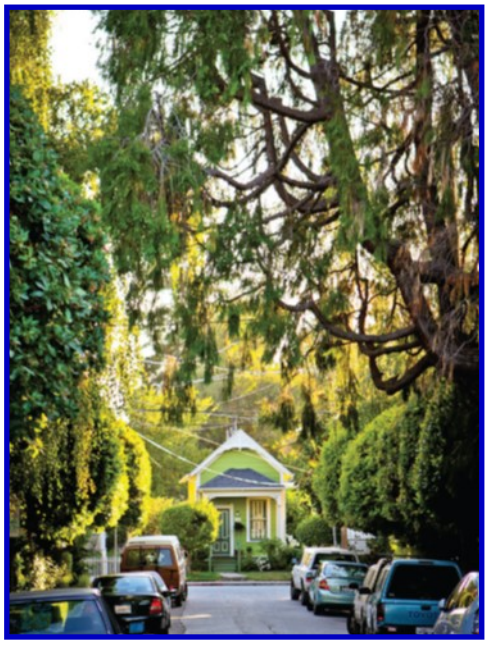
UCCE Master Gardener of Monterey & Santa Cruz Counties Teaching and Demonstration Garden

Located just east/ southeast of the UCCE headquarters at 1432 Freedom Blvd., Watsonville, CA. Its purpose is to educate Master Gardeners and the public with roughly 12 classes per year, and to train the class of new Master Gardeners every two years. It also gives Master Gardeners an opportunity and location to learn from each other, master new skills, showcase gardening techniques, and log volunteer hours. There were approximately 250 volunteer contacts and outreach during about 800 hours of volunteer service. On any given workday, there are from two to eight volunteers present. The classes average around 40 participants per class with roughly half of these MGs and half members of the public, so we taught about 450-500 members of the public. We also have 70 visitors as sporadic walk-ins to the

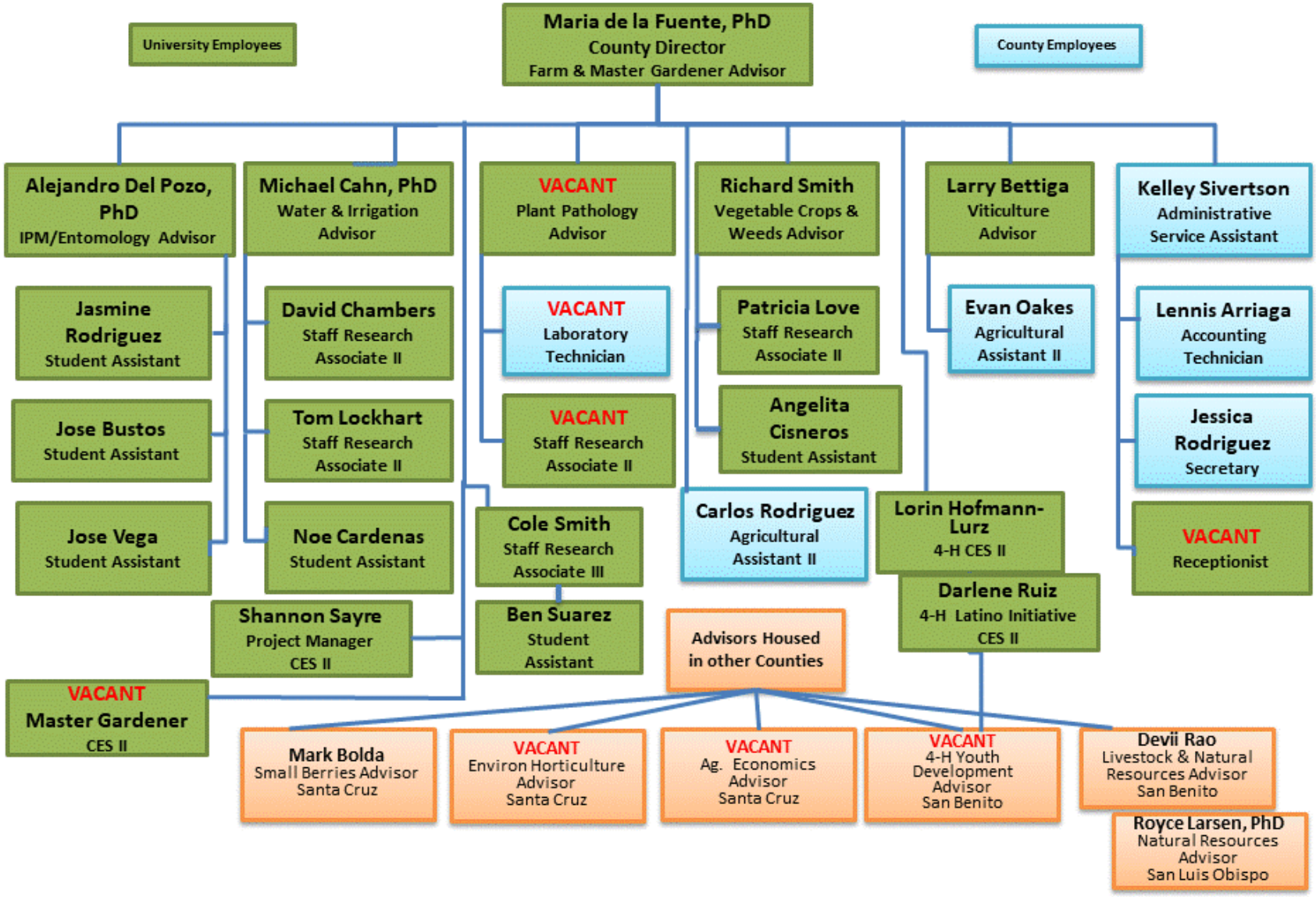
UCCE Master Gardener Program serves the tri-county area.

Santa Cruz Urban Tree Project

Is a partnership between UCCE Master Gardeners and the Climate Action Program for the City of Santa Cruz to develop a brochure directed to the Santa Cruz Public on the benefits of trees as they relate to limiting the impacts of climate change in our community. A grant from the California Department of Forestry and Fire (Cal Fire) allowed the City to plant 500 trees and create a brochure that is available to all Santa Cruz City residents; working with materials provided by the City and information on Vibrant Communities, we provided the text that was used for the City of Santa Cruz Urban Tree Planting and Inventory Project. We produced and distribute brochures in both English and Spanish for our Public Information Booths. It is our intent to develop a class on how home gardeners can build vibrant communities with trees.



University of California Cooperative Extension Monterey County, 2019 Organizational Chart



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We're on the web!

Visit us at cemonterey.ucanr.edu & ucanr.org

We wish to thank our 4-H volunteers, Master Gardeners, and student interns for their dedicated service. They help Cooperative Extension enrich the lives of many residents in Monterey County.

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