Riverside County
Cooperative Extension

Semi-Annual Report – July 1-December 31, 2023

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Visit our offices in Riverside, Palm Desert and Blythe, and let us know how UC Cooperative Extension in Riverside County can be of help to you.

For information visit us on the web at:

ceriverside@ucanr.edu

(951) 955-0170

Cooperative Extension
Riverside County

Cooperative Extension is an off-campus educational arm of the University of California, Division of Agriculture and Natural Resources. It came into existence when the Federal Smith-Lever Act of 1914 established the nationwide Cooperative Extension at land-grant universities. The mission of UC Cooperative Extension (UCCE) is to connect the power of UC research in agriculture, natural resources, nutrition and youth development with California counties to promote healthy people, healthy communities, healthy food systems, and healthy environments.

In Riverside, the University of California entered a Memorandum of Understanding with the County in 1917 to promote the vision of sharing UC research and science-based solutions to solve local issues and improve the lives of Riverside County residents by forming a strong partnership with Riverside County.

This report includes a summary of our programs with highlights, accomplishments and efforts from ***July to December, 2023***. Thank you for reading!

Rita Clemons

Area County Director

Riverside, San Bernardino and Orange Counties

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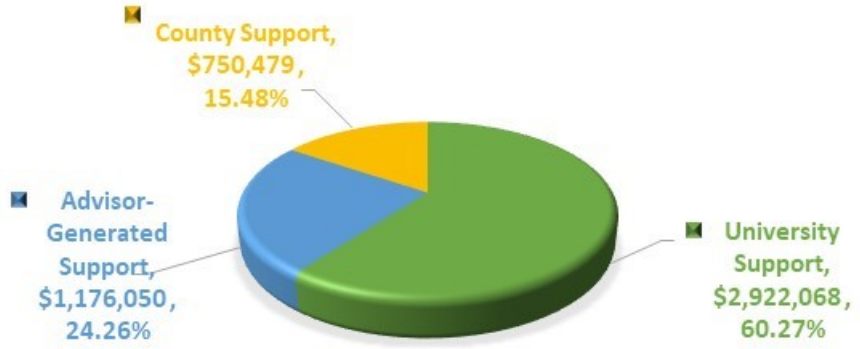
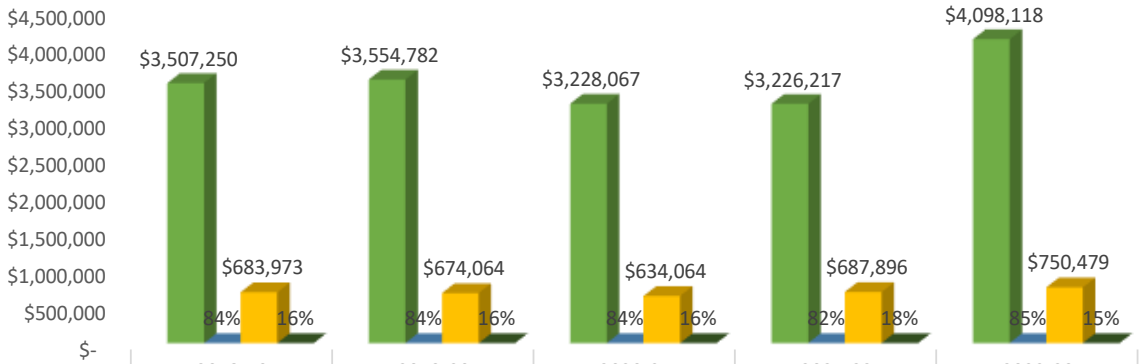
UC Cooperative Extension (UCCE) Riverside- Budget by Fund Source

Budget for Fiscal Year 2022-23

University Support	$	2,922,068	60%
Advisor-Generated Support	$	1,176,050	24%
County Support	$	750,479	15%
UCCE Riverside Total	$	4,848,597	100%



Budget for 5 years (FY 2018/19 to 2022/23)



	2018-19	2019-20	2020-21	2021-22	2022-23
University Support	$3,507,250	$3,554,782	$3,228,067	$3,226,217	$4,098,118
%	84%	84%	84%	82%	85%
County Support	$683,973	$674,064	$634,064	$687,896	$750,479
%	16%	16%	16%	18%	15%

4-H Youth Development Program

Riverside County 4-H Youth Development Program serves youth ages 5-19 in Riverside County and promotes hands-on, experiential learning for youth of all backgrounds and locations. Our community clubs, camps, in-school, afterschool, and special interest programs encourage youth to take on leadership roles and teach life skills, community involvement, and personal development while they engage in new experiences. The program is led by faculty, staff, and adult volunteers from the University of California Division of Agriculture and Natural Resources (UC ANR), a statewide network under the University of California. Our research-driven programming provides positive youth development opportunities that enable youth to reach their full potential as competent, confident, leaders of character who contribute to and are connected to their communities.

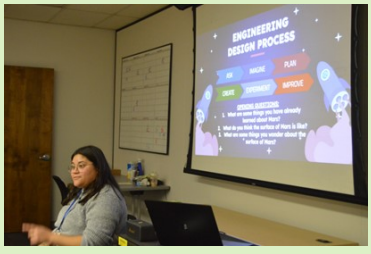
Workshop

Beginning in September 2023, our team hosted bi-monthly **STEAM Family Nights** at the UCCE Riverside office until December 2023. These hands-on STEAM workshops included a variety of different topics for each session, including building our own stomp rockets from recycled materials, building our own functional Mars Rover mini prototype using a 4-H STEM curriculum, crafting special telescopes to learn about constellations, navigating the surface of Mars with small parachute games and card games, and making our own Holiday cards with a simple LED circuit! 4

The workshops were very well received from the local community, as it sparked lots of interest in the families who attended the STEAM nights in joining the 4-H Youth Development Program, and even starting a club in the city of Riverside! Our team is currently in the process of starting a club in Riverside, with the new UCCE Riverside office serving as the main general and project meeting location for this new highly anticipated club.

(Left) Youth pose with their completed DIY Holiday cards with LED lights.

(Right) Youth pose for a photo during our last STEAM Family Night.



(Left) Riverside County 4-H Program Representative Leslie Rendon explains the engineering design process during the 3rd STEAM Family Night.

(Right) Youth navigate their surface of Mars poster after completing their Mars Rover prototype.

4-H Youth Development Program

Training

LEADERSHIP TRAINING DAY 2023

On Saturday, September 16, Riverside County 4-H hosted a county-wide Leadership Training Day for adult volunteers and teen youth members involved in leadership roles within their local clubs. This opportunity included conference-style workshops, a delicious lunch provided by the Riverside County 4-H YDP Management Board, and fun activities! Youth members and adult volunteers from at least 7 different clubs throughout the county attended this event and were provided with valuable resources, training, and important information they could take back to their respective clubs.

Riverside County 4-H staff, volunteers, and youth members pose for a photo at the end of the event.

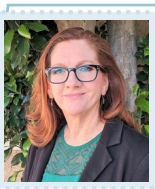
Project

UCR ROPES COURSE & CIVIC ENGAGEMENT/ SERVICE-LEARNING LEADERSHIP PROJECT

In efforts to encourage youth to get involved in county-wide projects and events and learn more about UC Riverside, our Riverside County 4-H YDP Management Board and staff planned and coordinated a UCR Ropes Course activity open to 4-H youth members ages 8-19 on October 28, 2023. The event brought together youth members from many of our clubs in Riverside County and served as the first step in developing a county-wide civic engagement/service-learning leadership project that youth will be able to participate in this program year to strengthen their teamwork and leadership skills and enhance their participation in county events.

Youth members warm up with a quick teamwork exercise.

Youth use their teamwork and communication skills to roll a ball into a small cone using only a curved plastic surface to guide the ball down.



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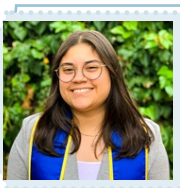

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Agricultural Economics/Farm Management

Agricultural Economics/Farm Management
https://ucanr.edu/sites/Farm_Management/

Farm Management/ Agricultural Economics - Production economics, decision-making at the farm level, integrated input management, risk management. Riverside, San Diego, San Bernardino, Imperial, Santa Barbara, San Luis Obispo, Los Angeles, Orange, and Ventura counties.

Program's mission to determine enterprises profitability and create understanding of what affects profit; thus guiding growers' to betterment of management strategies and guiding researchers and educators future program planning and collaborations for ag. Sustainability, food safety and security.

Dates Establishment, Production costs and Profitability Analysis Study

Coachella Valley ***(2023-24)***

Analyzing investment costs and profitability of establishing dates orchard in the Coachella Valley in 2024 is in progress. The study will provide summary of current production practices as well as financial in depth study for projecting investment needs and projecting whether the enterprise will be profitable or not. The study also provides growers and investors basis for financial transactions. It is also an education tool, research and information resource for policy makers.

Agricultural Economics/Farm Management

Topics in Subtropics Newsletter

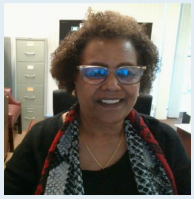
University of California Cooperative Extension

Fresno, Kern, Madera, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara,Tulare,&Ventura Counties

News from the Subtropical Tree Crop Farm Advisors in California

Two quarterly newsletters during the summer and the Fall of 2023 disseminated. A statewide newsletter editors, we provided 11 articles of new research results and information to educate clientele with improved production practices and management of Subtropical Crops enterprises. https://ucanr.edu/sites/Farm_Management/Topics_for_Subtropics_Newsletters/

2023, Vol 24, Fall	TOPICS IN THIS ISSUE:	File
	• IRCHLB? • Pocket Gopher Managment • Phytophthora Diseases of California Citrus • Airblast Sprayers • Temperature Inversion Data Helps Guide Frost Responses • Bodil Cass - New Subtropical Fruit IPM Specialist	PDF
2023, Vol 23, Summer	TOPICS IN THIS ISSUE:	
	• Avocado Production in the World: Observations of production and consumption growth. • USDA-APHIS Approves New Fuller Rose Beetle Mitigation-a Voluntary Option to Reduce Pesticide Applications. • DONT'S-Suggestions for Citrus and Avocado Growers and Others • California Efforts to Control Citrus HLB • Dr. Hamutahl Cohen was appointed as an Entomology Advisor with UC Cooperative Extension in Ventura County.	PDF



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Community Nutrition and Health

As an Area Youth, Families, and Communities Advisor based at Riverside County UCCE, I academically oversee CalFresh Healthy Living, UC, Expanded Food and Nutrition Education Program (EFNEP), and Master Food Preservation program. Our programs have a common goal to improve community nutrition and health. Specially, we engage with limited-resources families, individuals, and communities to evidence-based nutrition and health knowledge to improve their well-being and living environment. I provide leadership, bring expertise, and research to strengthen, and expand Community Nutrition and Health Extension education programs.

Research Highlight

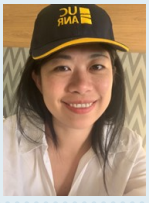
California's agriculture sector alone generated more than $55 billion in economic output. Among the top 15 productive counties in the state is Riverside County. The Coachella Valley Agriculture sector is valued at an estimated $600 million. It accounts for half the estimated $1.3 billion agriculture industry in Riverside County. Despite boasting multibillion-dollar agricultural industries, the region could be some of the most vulnerable place to work as a farmworker. Compared to all California counties, Riverside has higher instances of poor mental and physical health days, higher levels of food insecurity, higher percentage of uninsured population, lower levels of high school completion, and higher levels of injury-related deaths. Further, Riverside County has the 14th highest percentage of driving deaths with alcohol involvement.

Despite the critical importance of farmworkers in the multibillion-dollar agricultural sectors of Riverside County, California, migrant farmworkers are at increased risk of experiencing mental and behavioral health problems when compared to other labor-intensive occupations. To address this need, we created an outreach and education project that tailors Changing Our Mental and Emotional Trajectory curriculum to Hispanic/Latino migrant farmworkers through a tiered intervention approach. The project also aims to explore the secondhand effects of alcohol and drug stressors, examine the prevalence of depressive and anxiety symptoms, and identify the coping strategies used among Hispanic/Latino migrant farmworkers to manage their job-related stressors and substance use exposure at work and home sites.

Farmworker Housing

Data were collected between August and October 2023 at two known migrant housing sites in Riverside County. Advisor Meng collaborated with San Diego State University bicultural and bilingual research personnel administered the survey verbally and in person to respondents. Results are pending published. With more understanding of the target population's mental health and needs, needed outreach program will be developed to support the farmworker population in our region. SDSU research students working with Advisor Yu Meng collecting data at a farmworker housing site.

Yu Meng with CFHL, UC Staff hold and distribute healthy living resources at farmworker fair table.



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Community Nutrition and Health

CalFresh Healthy Living, UCCE

The CalFresh Healthy Living, University of California Cooperative Extension (CFHL, UCCE) program provides research-based education in the areas of nutrition, food safety and consumer economics. CFHL is working on two UC ANR Strategic Vision 2025 Initiatives: 1) Healthy Families and Communities: promoting healthy behaviors for childhood obesity prevention; helping consumers make informed decision regarding food choices, nutrition, and health; and improving consumers' food management skills, and 2) Ensure Safe and Secure Food Supplies: educating community organizations and consumers on safe food handling practices. CFHL, UCCE is one of four local implementing agencies for the CalFresh Healthy Living Program (CFHL) also known as SNAP-Education, funded by USDA through the California Department of Social Services. CFHL's mission is to inspire and empower under-served Californians to improve their health by promoting awareness, education, and community change through diverse partnerships, resulting in healthy eating and active living.

CFHL, UCCE welcomed ***new Community Education Specialists 2,*** *Alondra Alonso to the Riverside team on December 4, 2023.*

Accomplishments

Sixty-four **Policy, Systems, and Environmental (PSE)** changes were adopted with 26 sites, including 19 schools, 9 Early Care and Education (ECE) sites, and 3 community-based organizations. Garden-based education and support was provided at 12 locations including 9 schools, and 3 community gardens. The Riverside team completed 17 PSE needs assessments at 10 sites including 15 Smarter Mealtimes projects at 9 sites, 1 Smarter Lunchrooms Movement project, and 1 School Garden Assessment. Overall PSE efforts reached 20,900 youth and adults countywide, an increase 1,499 from FFY22, despite staffing shortages.

Major achievements/outcomes include:

- ***Supported 12 gardens, 9 school gardens, and 3 community gardens.***
- ***Reached 4,131 total participants with direct education.***
- ***Reached 132,654 participant with indirect education, 25,435 newly reached.***

New Partnership with La Sierra University (LSU):

CFHL, UCCE Riverside started partnering with the La Sierra University Urban Agriculture Professor to provide Service-Learning opportunities to the Urban Ag students in the fall semester 2023. CFHL, UCCE Riverside Team presented an overview on CFHL, UCCE Riverside Program to the Urban Ag class in September and students signed up to be extenders for implementing Teams with Intergenerational Support (TWIGS) garden-enhanced curriculum lessons with 5 local secondary schools within the Alvord Unified School District. CFHL, UCCE Riverside has enjoyed working with the university students in the school gardens, and to develop new TWIGS slide presentations that will be used and shared with other CFHL, UCCE counties statewide.

Community Nutrition and Health

CalFresh Healthy Living, UCCE

Accomplishments

Torres Martinez Desert Cahuilla Indian Reservation

The CFHL, UCCE Riverside team has continued to strengthen the collaboration and co-capacity building activities with Torres Martinez. The CFHL, UCCE Palm Desert Team continued to provide garden support and coordinated planting events in the thriving A'Avutem (Senior) Garden.

Two Torres Martinez Community Wellness Committee members collaborated with CFHL, UC and CFHL, UCCE Riverside to co-create a poster that was published for the CFHL Statewide Forum in October 2023. TM tribal member and CFHL Tribal Ambassador is seen in the photo below with Educator Esmeralda Nunez and CFHL, UC State Office lead Andra Nicoli at the CFHL Forum.

Torres Martinez in FFY2023

- 31 Adults reached with direct nutrition, physical activity, and garden-based education with food tastings through 6 Good Foods Healthy Minds workshops, (8 lessons).
- 109 tribal members reached with indirect nutrition education from the CFHL Tribal Ambassadors Committee's plant ID Guides for CA Native Traditional Foods and culturally relevant cookbooks, & recipe cards.
- Facilitated and coordinated 11 monthly consultative Community Wellness Committee (CWC) meetings that focus on health and wellness initiatives for the tribe chosen and approved by tribal leadership.

Cal Fresh Living, UCCE Riverside Program Staff
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Esmeralda Nunez, CES II, eannunez@ucanr.edu
Marlen Gaspar, CES II, mgaspar@ucanr.edu
Vianca Nunez, CES II, vnunez@ucanr.edu
Alondra Alonso, CES II, aalon@ucanr.edu

Torres Martinez Impact

Of the 22 TM respondents who had drank a sweet beverage every day, 55% reported they will drink a sweet beverage less often within the next week.
"We are planting the seeds for next 7 generations to be the ones who will grow food to be our medicine, harvest the medicine to be our food, and fill the food baskets to feed our tribe and community."
Tribal Council member,
Altrena Santillanes

Community Settlement Association (CSA)

The CFHL, UCCE Riverside team continued to coordinate and lead the CSA Garden Club offering **24** opportunities for the CSA participants to engage in garden maintenance days where they increase their nutrition/ garden-based knowledge and are physically active with their neighbors.

In FFY23, the CFHL, UCCE Riverside team expanded the educational opportunities for CSA participants reaching 36 adults with 11 direct education workshops in nutrition, physical activity, and garden-based education with food tastings.

Riverside Faith Temple (RFT)

CFHL, UCCE Riverside continued to provide garden support to the Riverside Faith Temple Community Garden along with garden-enhanced nutrition education in partnership with UC Master Gardener Program.

CFHL, UCCE Riverside formed a new partnership with the Bruised but Not Broken Family Resource Center (BBNBFRC) Program at Riverside Faith Temple expanding our reach to over 30 RFT participants to receive nutrition & garden education workshops with a food demonstration and/or food tasting.

Community Nutrition and Health

Expended Food and Nutrition Education Program

The **Expanded Food and Nutrition Education Program (EFNEP)** assists limited-resource families to gain the knowledge, skills, attitudes, and changed behavior necessary to choose nutritionally sound diets and improve their well-being. EFNEP is a federally-funded program through the United States Department of Agriculture National Institute of Food and Agriculture (USDA NIFA) that offers nutrition education to limited-resource families and children in all 50 states and U.S. territories. In California, EFNEP is administered by the University of California Cooperative Extension in 24 of California's 58 counties.

The Eating Smart Being Active

The EFNEP Program continues to reconnect with past partners and create new relationships with schools in Riverside County. The Moreno Valley Adult School participated in the Eating Smart Being Active (ESBA) series with both English Language Learners and pharmacy students. In addition, Val Verde USD provide a second series of ESBA at their parent center and will provide additional workshops at one of their elementary schools in the New Year. EFNEP also continues to build relationships with tribal communities including attending the IAC Pacific Regional Summit where our educator learned about d***ecompartmentalizing Agriculture with Traditional Ecological Knowledge & Regenerating the Land through the People.***

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Roxana Price
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Community Nutrition and Health

Master Food Preserver Program

For more than 30 years UC Master Food Preserver volunteers have shared research-based home food preservation information with the public. Programs are now thriving in 17 counties across the state of California. Riverside County is 1 of 3 new counties that are joining the Master Food Preserver program in 2023. Statewide we have just over 500 volunteers that have collectively contributed 20,235 hours to improving the lives of communities we live in.

Activities

The Master Food Preserver program delivered 2 classes at the Riverside Corona Resource Conservation District.

Class—1

Our first class was attended by over 20 residents. This 2-hour class was a basic introduction to home food preservation. The class included a hands-on element where attendees were able to try various type of canning equipment. During the class we reviewed estimated costs and options to get started.

Class—2

Our second class was a hands-on demo using local apples. We demonstrated how to use an instant pot to help reduce the prep time in making apple jam, but it also showed a great way for individuals to use equipment they may already have. We had an in depth discussion on using Pomona Pectin and the benefits this product offers. Our demonstration included using a steam canner, which shows a low water option for processing shelf stable products. 5 lucky attendees were able to take home the product we made during our class.

Denneigh Denton
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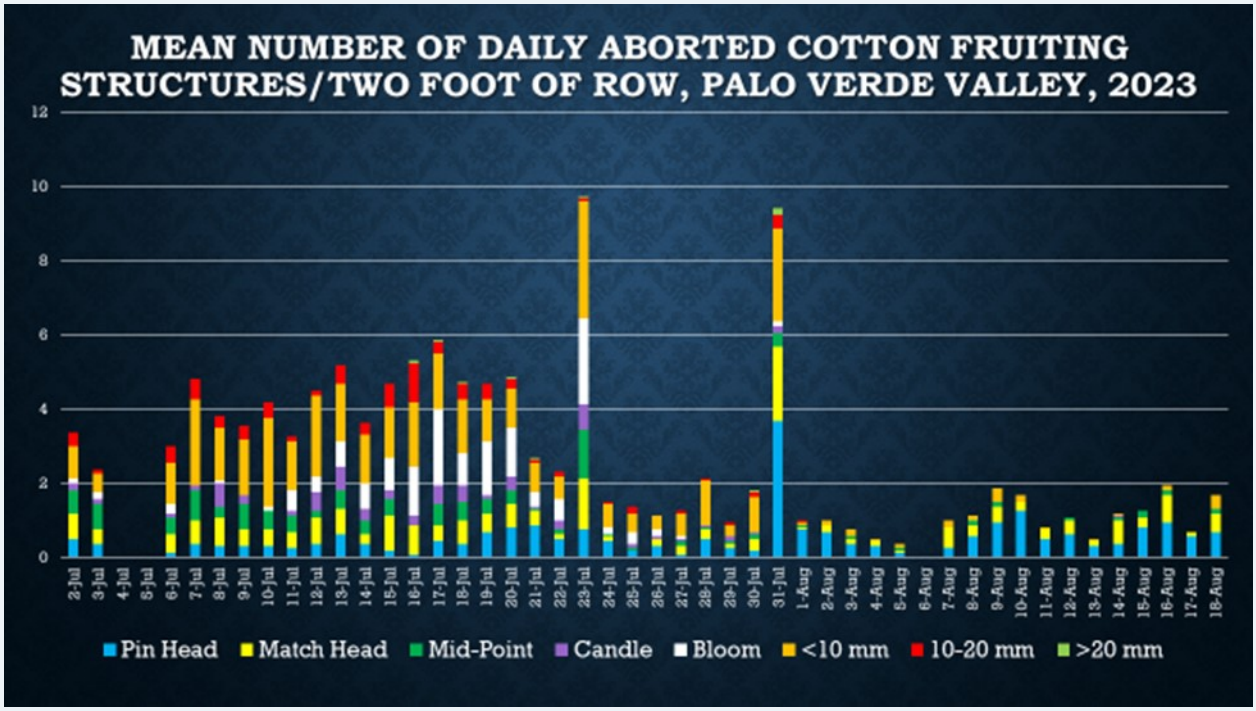
Crop Production and Entomology

Projects conducted during July-December 2023 focused on mitigating cotton crop loss associated with heat stress (4 field sized replicated strip trials, and one other project involving 4 fields to documents losses and temperature relationships), and insect control in fall alfalfa. Several educational meetings were organized on various crop related topics (alfalfa production, seaweed extract products, innovations in water use reduction, crop sustainability). Results from previous trials and field discoveries were shared at a number of venues (Western Alfalfa and Forages Symposium in Reno, NV; Western NACAA meetings in St. George, UT; University of California Cooperative Extension meetings in both Riverside and Imperial Counties).

Cotton Fruiting Structure Losses Aborted fruiting cotton structures were collected daily from four (4) fields across the Palo Verde Valley during 2023. Data for most dates are shown below. Much loss happened during the first half of July prior to heat stress being noted, indicating that more than heat stress is involved with crop loss. The two (2) peaks noted in for July 23 and 31 are associated with strong winds (>20 mph) as weather fronts came across the valley. The winds caused movement of cotton branches and the rubbing of branches resulted in fruiting structures being knocked off of plants.



Four (4) trials were conducted in growers' fields, evaluating 8 products to mitigate crop loss.

Crop Production and Entomology

Recognition and Accomplishments

4-H/Youth Served as coach of the California 4-H team and other youth horticulture members that participated in the national contest. California 4-H team placed second (2nd) with all 3 team members placing in top 10 individuals. Two individuals won their divisions (4-H, high school open class).

Professional Society

Selected as national committee chairman for the agronomy/pest management committee, presented posters at national meeting and western regional meeting.

Educational meetings

Organized several local meetings, providing both educational content and continuing education units as appropriate for local growers and PCAs. Alfalfa production meeting had over 50 in attendance. Also developed and gave presentations in Imperial County and at Western Regional Alfalfa Symposium at Reno, NV, in addition to local presentation on alfalfa insects.

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Environmental Horticulture

The primary responsibility of my position in Riverside County is to develop and extend research-based information on drought, heat and pest tolerant landscape plants to arborists, landscapers, and government agencies. Goals are to broaden the plant palette of suitable native and non-native trees, shrubs, and groundcovers and to reduce impacts of urban heat islands by enhancing tree canopies in low-shade underserved neighborhoods. I also manage the Riverside County Master Gardener program and provide guidance and support to Volunteer Services Coordinator Rosa Olaiz.

Trees for Tomorrow Start Today Presentations and Program Expansion

California currently has the lowest density of urban street trees in the USA due to poor species selection, a lack of proper tree care, and invasive insects and diseases. To help reverse this trend, I provided training through webinars and live workshops and seminars to over 1,500 public and private urban foresters, landscapers, landscape architects and other 'green industry' professionals and Master Gardeners on the following topics: climate-resilient trees (research project update); proper tree selection, placement and care; use of reputable search engines to select climate-resilient trees; identifying and correcting abiotic plant disorders; and, insect and disease prevention and management. I also continued to provide training to UCCE Riverside County Master Gardeners who are now leading tree education/tree give-away programs that cool and enhance tree canopy cover in low shade neighborhoods. Through the program, short informal talks on climate-resilient species are given by Master Gardeners to tree recipients, with regular follow up to ensure the health of the trees long term. This program is important for two major reasons: the shade from a single well-placed tree can decrease temperatures of black asphalt and other impervious surfaces (including artificial turf and dark mulches) during late spring and summer from 165^0F to 100^0F, eliminating serious burns that would otherwise occur to people and pets; and, improper tree species selection and care results in less than 40% of landscape trees living for 20 or more years, greatly reducing their societal and ecosystem benefits.

MGs San Bernardino and Riverside Jurupa Valley

Environmental Horticulture

Applied Research

I serve as a co-principal investigator with other UC Cooperative Extension (Janet Hartin, Jim Downer, Alison Berry) and US Forest Service (Greg McPherson, Natalie Doorn, et al.) scientists on a 20 year 'climate-ready landscape trees' project at UC Riverside to measure the drought, heat, and pest resistance and overall performance of 12 under-planted species of native and climate-adapted non-native landscape trees. The project is entering its eighth year. To date, 11 of the 12 species are performing well under no supplemental irrigation since March 2020. Results of this study have been shared with public and private sector decision-makers and stakeholders including planners, landscape architects, city foresters, wholesale and retail nursery personnel, and landscapers via webinars and live presentations/meetings. Results from a linked-trial (also in the inland valley) that I led with Dr. John Bushoven (Dept. Chair, Horticulture, Cal State, Fresno) that measured root system densities of four species from the larger 'climate ready landscape tree study discussed above in which trees were either mulched or left unmulched continue to be shared. Root systems were measured using a non-destructive ground penetrating radar system. Results show that mulched trees had shallower, less dense root systems than roots in unmulched controls. These trials provide new data not previously available that I have shared with the "green industry" underscoring the importance of deep, infrequent irrigation beneath the root zones of mulched maturing trees to maximize deep rooting necessary to physically support large growing shade trees. (Mulch treatments around trees are often recommended to reduce soil evaporation which is an important water conservation method, especially during drought and water restrictions.) Information from this study is also beneficial in fire-prone areas in which organic wood-based mulches can be a fire hazard.

Master Gardener Program Academic Oversight

I provided academic oversight for the UCCE Riverside County Master Gardener program which included updating educational materials, writing monthly newsletter articles, editing the newsletter, addressing inquiries about my research results, and helping with Master Gardener-led projects, such as the Trees for Tomorrow Project and the Prescott Preserve in Palm Springs.

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Master Gardener Program

Riverside County pioneered the establishment of a Master Gardener volunteer program and has become instrumental for the expansion of the program throughout the state. Since its inception in 1980, we have disseminated over 1,500 Master Gardener graduates into the community with knowledge to extend environmentally safe and economically efficient gardening and landscaping.

Riverside County pioneered the establishment of a Master Gardener volunteer program and has become instrumental for the expansion of the program throughout the state. Since its inception in 1980, we have disseminated over 1,500 Master Gardener graduates into the community.

Congratulations

to the UC Master Gardener Program of Riverside County on winning first place in the 2023 UC Master Gardener Search for Excellence competition.

Master Gardener's work with the Soboba Cultural Garden stood out as an extraordinary testament to the power of gardening. The Search for Excellence competition takes place every three years and allows UC Master Gardeners to showcase projects for a chance to win recognition and a cash prize. After careful consideration by the judges, three winners were selected with Riverside County taking the top prize winning $1500. The results of the hard work at the Soboba Cultural Garden are astounding. Crop yield has increased almost three times since plan implementation, and more than one ton of produce is generated every year. This produce is distributed to the community and also provides lunches at their preschool. The garden has decreased its water usage by more than 56% due to the new irrigation system. More importantly, as was the goal of the tribe, the garden is currently 100% organic. Joe Ontiveros, Soboba's Tribal Historic Preservation Officer, stated that "the technical assistance and guidance [Master Gardeners'] give is the best" when asked about the impact of the team.

Rosa Olaiz
Volunteer Services Coordinator
-Master Gardener
rmolaiz@ucanr.edu

Master Gardener Helpline
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Palm Desert: *anrmgindio@ucanr.edu*

Vegetable harvest from the Cultural Garden ready for delivery to the Preschool Chefs for lunched for students and Elder.

Thurman Howard, Master Gardener discussing cover crop of daikon radishes with Joe Ontiveros, Tribal Historical Preservation Officer.

Marilyn Howard, Master Gardener teaches Eloyd Rodriguez, Cultural Garden Manager, what to look for in new crop of lettuce.

The Small Farms and Specialty Crops Program

My extension and research program center on addressing challenges and issues impacting small-scale and specialty crop producers in the Inland Empire. The primary objective of my program is to offer culturally and linguistically appropriate outreach, aiming to enhance the skills and capabilities of socially disadvantaged, small-scale, limited-resource, and specialty crop producers. This includes empowering them to make crucial management decisions such as crop selection, variety development, sustainability practices, weed control, pest and disease management, irrigation methods, postharvest handling and storage, food safety, pesticide safety, marketing strategies, agritourism, as well as financial and risk management, among other aspects.

The program actively supports field research trials, educational programs, technical assistance, and publications, all geared towards promoting the sustainability of diverse and thriving small farms. Moreover, my program seeks to forge stronger connections between small-scale and specialty crop producers and local and government agencies such as the USDA and CDFA. This collaborative effort is aimed at facilitating increased access to resources and program participation.

In essence, my goal is to provide comprehensive support to farmers across all phases of their farming business development, ultimately contributing to the improvement of their farming operations.

Welcome

Small Farm sand Specialty Crops Program welcomed Two new employees to the Riverside team.

Francisca Barbon-Community Education Specialist-III

Jiana Choi-Staff Resrarch Associate–II

Food Safety Project

Historically underrepresented farmers encounter various challenges in implementing good agricultural practices (GAPs) and complying with the Food Safety Modernization Act (FSMA). These challenges include language barriers, financial hardships, lack of trust/ relationship, time constraints, and limited access to resources for technical assistance. The ongoing collaborative community outreach project focuses specifically on food safety, targeting historically underrepresented farmers, in the Inland Empire. The goal for this project is to provide farmers with the knowledge and educational resources needed to successfully implement food safety GAPs and FSMA Produce Safety Rule compliance requirements on their operations. To achieve this, we propose to adapt and develop existing educational resources to be culturally and linguistically appropriate to HU-farmers in the region. This will help HU-farmers prepare for the regulatory on-farm food safety inspection. The specific objectives are: 1) Provide hands-on technical assistance to historically underrepresented farmers in the Inland Empire region on food safety related GAPs and FSMA Produce Safety Rule compliance requirements through farm visits, one-on-one assistance, workshops, and tailgate meetings. 2)Develop and deploy culturally and linguistically appropriate food safety educational materials to meet the needs of historically underrepresented farmers in the region. 3)Evaluate adoption of food safety practices through site visits after educational events.

The Small Farms and Specialty Crops Program

Workshops

We conducted four workshops in Riverside County, with each session drawing more than 30 participants. The workshops covered topics such as specialty crop production, climate-smart crops, grant applications, and food safety.

Extension and Outreach

The Small Farm Program, in collaboration with the Vegetable Crops Program, organizes an agricultural tour of the Coachella Valley for participants attending the California Economic Summit. This tour highlights the dynamic agriculture of the Coachella Valley, encompassing vegetable, grape, and date productions.

Grants Availability

The California Small Agricultural Business Drought & Flood Relief Grant Program aims to offer assistance to small agricultural businesses that have faced a decrease in annual gross receipts or profits due to drought or flood conditions. The small farm team, serving as a technical assistant provider for the grant program, has been actively supporting farmers in Riverside County throughout the application process. Notably, individual farmers have already been granted over $125,000 for drought and flood relief. For more information on grants available in the county, please reach out the small farm team.

UCANR at the California Economic Summit

California Economic Summit Agriculture Tour

Survey

We are currently conducting an ongoing survey to assist farmers in determining their eligibility under the FSMA Coverage and Exemptions regulation. The survey can be accessed here: https://ucdavis.co1.qualtrics.com/jfe/form/SV_0OGEdblgh97g690

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Sustainable Agricultural Lands Conservation Program (SALC)

SALC is a statewide program offering planning, acquisition, and capacity & project development grants to a diversity of applicants across city and county local governments, California Native American Tribes, municipal planning organizations, and agricultural non-profits to conserve agricultural lands statewide and preserve their economic viability and sustainability across urban and rural communities by protecting lands at risk for conversion to non-agricultural uses, while reducing greenhouse gas emissions.

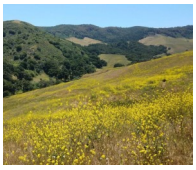
Dr. Chandra Richards continued her role at UC ANR as the Agricultural Land Acquisitions Academic Coordinator II. The SALC Program for Round 9 opened for applications in May for planning, acquisition, and capacity & project development grants after approval at the Strategic Growth Council (SGC) meeting in April. Full applications were submitted in August/September to the Department of Conservation (DOC) and award announcements were made at the SGC meeting in December 2023.

Projects

Chandra focused solely on connecting with local governments, California Native American Tribes, land managers, related partners, and agricultural community members and providing technical assistance for eligible entities interested in applying to SALC this Round 9. She worked with four key groups towards SALC planning grant proposals this Round 9: two in Southern California and two in the Central Valley (to boost regional equity and support projects after her colleague left for another position). **Three of the four projects were awarded SALC planning grants in December.** This includes the Southern California Association of Governments (SCAG), who host regular Natural and Farm Lands Conservation working group meetings. SCAG is interested in aligning multiple themes (including coordinated land use planning, climate resilience, and co-benefit growth), all of which align with a SALC grant.

Program Activities

In July & August, Chandra met with 20 individuals through the Inland Empire regarding the SALC program, including non-profit organizations, water districts, cities, and California Native American Tribes (both in-person and virtual). On the capacity & project development grants this Round 9, she supported several Inland Empire entities, including Oswit Land Trust (Riverside), Native American Land Conservancy (Riverside), and World Be Well, who all received awards in December 2023 to strategically develop acquisition projects in the Southern California region.



Sustainable Agricultural Lands Conservation Program (SALC)

Activities

She continues to work with UCCE colleagues, City of Riverside, and Riverside Food Systems Alliance to **highlight results of an agricultural workforce needs assessment**, which highlights Inland Empire agricultural community, barriers, and needs and has been disseminated to partners this year.

Alongside a Bay Area community development advisor and Southern California small farms advisors, a jointly-written application proposal for **the Climate Smart Land Management Program** application proposal submitted in May 2023 was awarded 1.7 million dollars by the California Department of Conservation. This grant work will start in 2024 and seeks to address equitable land access and land management diversification, boost capacity of underserved communities, and strengthen the scale of climate-smart action planning partnerships. Key state partners include the Community Alliance for Family Farmers (CAFF), California Farm Bureau Foundation (CFBF), California Association of Resource Conservation Districts (CARCD), and California Department of Food & Agriculture (CDFA).

In alignment with the California Conservation Planning Partnership, she will continue to work with key partners to host education and outreach events in Southern California, develop strategic research-based solutions, and secure funding for **the future of agricultural land protection and conservation**. The SALC Program will reopen recommendations to the guidelines in early 2024, followed by a longer program application period beginning in 2025.

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Vegetable Crops

Riverside County is comprised of four districts (Coachella Valley, Palo Verde Valley, Riverside/Corona, and San Jacinto/Temecula Valley) and they account for vegetable production valued over $328 M in 2022; 1% or $3.3 M more than that in 2021. Coachella Valley is considered a 'Winter Salad Bowl' of California, where most winter vegetable crops are grown. Cool season, winter and early spring vegetable crops include broccoli, brussel sprouts, cauliflower, cabbage, lettuce, carrot, celery, and artichoke, among others. Warm season fruiting vegetable crops include bell pepper, okra, tomato, cucurbits, and eggplant, among others. Our research and extension efforts are directed at addressing low desert vegetable production challenges with emphasis on pests and diseases but also include weeds, and soil health and fertility. In addition, we work with Native Americans and other socially disadvantaged communities to support food sovereignty and improve access to healthy food through backyard vegetable gardening and orchard establishment.

Meetings

In the past 6 months, we responded to 12 field calls by vegetable growers, organized a vegetable harvesting and educational field day, a vegetable planting event, and an in-field clientele-collaborator information exchange meeting. We spoke at 2 clientele meetings, co-authored a peer-reviewed journal article, and completed 2 field trials and 5 other trials underway. As far as the grants and contracts, we secured USDA/NIFA SCRI and CDFA Healthy Soil Program grants totaling $642,000 for projects to be implemented in the next 3-4 years. In addition to delivering services directly related to clientele, we also involved in Professional Competence and University/Public Service undertakings. As far as Professional Competence, we reviewed a grant proposal submitted to the CA Garlic and Onion Research Advisory Board for funding, a manuscript submitted to Ecology & Evolution journal for publication, and a UC IPM Pest Management Guideline submitted for publication.

We also delivered a talk and presented an applied research poster at the National Association of County Agricultural Agents (NACAA) meeting in Iowa (Fig. 1). In terms of University and Public Services, we conducted 3 farm tours, served in a search committee for SRA III position based in Fresno, taught Riverside County Master Gardener class, attended and/or participated in 2 Work Group Meetings in Salinas and Sacramento, and served in leadership roles as Membership Committee Chair with the Society of Nematologists and as Western Regional Committee Vice-Chair for Professional Excellence with NACAA.

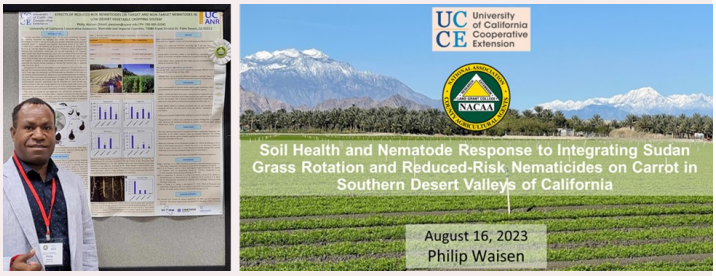


Figure 1. Showing applied research poster presentation (A) and an opening slide of a 30-minute oral presentation at the National Association of County Agricultural Agent meeting in Des Moines, IA (B).

Vegetable Crops

Publication

We co-authored a peer-reviewed journal article published in the Journal of Economic Entomology (https://doi.org/10.1093/jee/toad184). The article highlighted the efficacy of organic and systemic insecticides against a scale insect.

Grants and Contracts

We collaborated on a multi-state USDA/NIFA SCRI grant proposal 'Ensuring Future Economic Viability of US Short-day Onion Production Through Mechanical Harvesting' and received a sub-award of $192,000. This is a 4-year grant from 2023-2027 led by Texas A&M researcher, Dr. Subas Malla. A varietal trial is currently underway evaluating 11 short-day onion varieties for firmness. In addition, 3 CDFA Healthy Soil Program proposals submitted as a PI or Co-PI have all received funding totaling $450,000 for demonstration projects to be implemented from 2024-2027.

Meetings/Field Days

We organized 3 meetings or field days and delivered 2 talks at clientele meetings. A 'vegetable harvesting and educational field day' was held at the Coachella Valley Research Station (CVARS) to share findings of a melon field trial where reduced-risk nematicides were evaluated. In collaboration with the Riverside CalFresh team, we organized a 'warm-season fruiting vegetable planting event' at Torres Martinez Desert Cahuilla Indians tribal senior garden where we planted melons, tomatoes, okra, and peppers (Fig. 2A -B). We also organized an 'in-field clientele-collaborator information exchange meeting' where 2 small growers, USDA/NRCS conservationists and engineers, and UCCE Advisors and Community Education Specialists met to discuss implementation of cover crop projects (Fig. 2C). As far as speaking at clientele meetings, we spoke at the '34th Fall Desert Crop Workshop in Imperial Valley' and at 'Growing Coachella Valley' monthly meeting on soil health improvement strategies.

Figure 2. Showing vegetable planting event at tribal senior garden at Torres Martinez Desert Cahuilla Indians reservation in Thermal (A-B), and in-field clientele-collaborator information exchange meeting (C).

Vegetable Crops

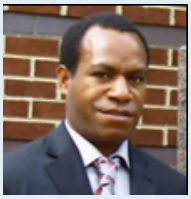
Research Projects: We completed 2 nematicide trials on okra and carrot evaluating reduced-risk nematicides at the CVARS. Five more insecticide efficacy trials are undergoing on broccoli, lettuce, and cabbage targeting caterpillar insect pests (Lepidopterans – beet armyworm, diamondback moth, imported cabbage worm, and cabbage looper). In addition to efficacy trials, a cover crop trial is undergoing evaluating biofumigation, soil health, and green manure effects of brown mustard, Sudan grass, and oat and pea cover crop mix (Fig. 3A).

Field Calls and Visits: We responded to 12 field calls from bell pepper, green bean, lettuce, and okra growers. We positively identified root-knot nematode on bell pepper and suspected Fusarium wilt on iceberg lettuce (Fig. 3B). We submitted bleaching symptomatic bell pepper plants and suspected planthopper-vectored virus infestation (Fig. 3C). Fusarium and virus suspect plants were sent for diagnosis.

Laboratory Space:

We have a small and somewhat working laboratory space now equipped with a refrigerator, an inverted microscope for nematode identification, 2 dissecting scopes for insect identification, an oven for drying samples, two centrifuges, a Baermann Funnel setup for nematode extraction from soil, and a Bento Lab for DNA Extraction. We are looking for a compound microscope, an incubator, and a -80 °C Freezer to store DNA samples.

Figure 3. Showing a cover crop trial (A), iceberg lettuce field infested with Fusarium wilt, and bell pepper stands showing bleaching symptoms suspecting planthopper vectored virus (C).



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Viticulture

The viticulture program addresses issues affecting production and fruit quality in wine and table grapes. It develops research projects and extends basic and applied information through educational programs including seminars, workshops and field demonstrations to growers, pest control advisors, and field managers on identification and control measures of pests and diseases.

Research Activities

The Western grapeleaf skeletonizer is a pest that could cause devastating loses in vineyards if left unchecked. In 2023 the grapeleaf skeletonizer was monitored using an optical sensor trap to construct the pest population cycle. This trap uses artificial intelligence (AI), is wireless and has a unique sensor to recognize the pest; once detected, delivers alerts as text to a smart phone application or web dashboard. Monitoring insects using traps with optical sensors is a promising alternative and a useful tool to alert the presence of the insect in real time and the information can be communicated to the farmers via email to make timely decision to manage the insect.

Another pest that is a concern to the winegrowers is the Argentine ant, an invasive species that causes problems worldwide in agricultural and urban settings. Traditionally ant populations have been managed using insecticides or bait stations which are costly to maintain. I collaborated with a group of researchers and advisors from the University of California to evaluate the effectiveness of an ant bait delivered using hydrogels. The idea was to use the hydrogels to deliver the sugar liquid food with an insecticide taking advantage of the ant feeding behavior called "trophallaxis", which consists of ant workers passing the food they collect to the brood and the queen. The research team tested two types of hydrogels: biodegradable hydro gels made of seaweed alginate which can be used in organic crop production, and polyacrylamide hydrogels which are not organic but can be purchased on a commercial scale. For more information please visit ***https://doi.org/10.1007/s10340-019-01175-9.*** This research has demonstrated the potential to reduce ant populations on citrus orchards and wine grape vineyards using hydrogels as ant bait.

Extension Highlights

Research updates on pest and disease management practices of the most common insects were delivered through seminars including presentations in Spanish to educate and inform the farm workers. The highlight in the fall was a full day workshop to provide the information of the use of hydrogels for ant control in vineyards.

Viticulture

Pest Management Images

Sticky trap with grapeleaf skele-

Trap with optical sensor

Grapeleaf skeletonizer eggs

Grape leaf skeletonizer early damage

Grape leaf skeletonizer damage

Ant Workshop Temecula Valley

David Haviland demonstrating field delivery of hydrogels

Organic hydrogels made of seaweed alginate

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Woody Biomass and Bioenergy

Woody Biomass and Bioenergy encompasses innovative extension education programs and applied research associated with the use of forest resources and biomass and bioenergy development in Riverside and San Bernardino Counties. The program investigates opportunities and strategies for increasing the use of woody biomass through development of biofuels and bioenergy as well as other products. The programs also aim to integrate efforts to enhance biomass management and natural resources manufacturing for reducing community risk from wildfires. The goal of the biomass and bioenergy program is to develop and extend research-based information on converting woody biomass into fuels for transportation and other products consistent with the California Forest Carbon Plan.

Wood chips as part of the process of turning wood into energy

Conferences

I have been participating and presenting at conferences/seminars to network and advocate for UC ANR Woody Biomass and Bioenergy program awareness and support, sharing research results and ideas with a wider range of audiences. One such example was California Economic Summit held in Palm Desert, CA in October 2023. I participated in the panel discussion on opportunities to utilize woody biomass to reduce wildfire risks and produce low carbon or carbon-negative fuels such as hydrogen. This event coincided with the announcement from the US Department of Energy, where California was selected to receive up to $1.2 billion to accelerate the development and deployment of clean renewable hydrogen, critical to cutting pollution and expanding the clean energy economy statewide.

UCCE Advisors with VP Glenda Humiston at California Economic Summit 2023

Woody Biomass and Bioenergy

Projects

In December 2023, we applied for Wood Innovations Grant under the USDA grant program for the project title "Developing Forest biomass-derived hydrogen market in California". This project aims to develop and advance the forest biomass-derived hydrogen market in California by working in conjunction with multiple collaborators and industry partners, including the Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES), Yosemite Clean Energy, Heartwood Biomass, Mote Hydrogen, California Energy Commission (CEC), Bioenergy Association of California (BAC) and the Governor's Office of Business and Economic Development (GO-Biz).

This project will develop business scenarios for industry partners and conduct market analysis for biohydrogen. The project will incorporate life cycle assessment (LCA) and techno-economic analysis (TEA) tools to carry out cost and permitting analyses, location and production process selection for facilities, and operation cost and the internal rate of return analysis. A formal business development plan will be developed to advance hydrogen production and market.

Presentation

In August 2023, I participated in a panel discussion organized by the Rural County Representatives of California at the joint RCRC/CSAC/CalCities. The presentation was focused on the energy potential resulting from forest biomass-derived hydrogen production.

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April 2023

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