

**SUBMITTAL TO THE BOARD OF SUPERVISORS
COUNTY OF RIVERSIDE, STATE OF CALIFORNIA**



ITEM: 2.8
(ID # 22909)

MEETING DATE:
Tuesday, September 26, 2023

FROM : COOPERATIVE EXTENSION:

SUBJECT: RUHS Public Health/Cooperative Extension: Semi-Annual Report January - June 2023, All Districts [\$0]

RECOMMENDED MOTION: That the Board of Supervisors:

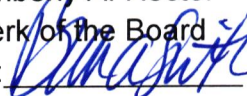
1. Receive and file the attached Cooperative Extension semi-annual report.

ACTION:Consent

MINUTES OF THE BOARD OF SUPERVISORS

On motion of Supervisor Gutierrez, seconded by Supervisor Washington and duly carried by unanimous vote, IT WAS ORDERED that the above matter is received and filed as recommended.

Ayes: Jeffries, Spiegel, Washington, Perez and Gutierrez
Nays: None
Absent: None
Date: September 26, 2023
xc: RUHS-PH/Cooperative Extension

Kimberly A. Rector
Clerk of the Board
By: 
Deputy

**SUBMITTAL TO THE BOARD OF SUPERVISORS COUNTY OF RIVERSIDE,
STATE OF CALIFORNIA**

FINANCIAL DATA	Current Fiscal Year:	Next Fiscal Year:	Total Cost:	Ongoing Cost
COST	\$0	\$0	\$0	\$0
NET COUNTY COST	\$0	\$0	\$0	\$0
SOURCE OF FUNDS:N/A			Budget Adjustment: N/A	
			For Fiscal Year: 22/23	

C.E.O. RECOMMENDATION: Approve

BACKGROUND:

Summary

This item is a semi-annual report summarizing the services that Cooperative Extension provided over the course of the last 6 months.

UCCE, in partnership with the County of Riverside, has provided research-based information and educational programs to the residents of county of Riverside for over 100 years. Following the establishment of the Federal Smith Lever Act (1914), the County and the University entered into a cooperative agreement in 1917. The Smith-Lever Act created a nationwide Cooperative Extension network to bring research and education from land grant universities to the public.

Section 32330 of the State Education Code allows the County Board of Supervisors to appropriate funds for the support and maintenance of extension work in order to maintain the partnership.

Impact on Residents and Businesses

University of California Agriculture and Natural Resources (UCANR) brings the power of UC research to give people the tools to improve the lives of all Californians. This is done through both county-based Advisors and campus-based Extension Specialists who work as teams to develop and provide practical, trusted, science-based answers to solve practical issues that face Californians. The University of California Cooperative Extension (UCCE) Advisors are problem-solvers, catalysts, collaborators, educators, and stewards of the land, living in the communities they serve.

- Promoting economic prosperity—improving agricultural production and developing a qualified workforce.
- Promoting healthy people and communities through nutrition education and 4H youth development programs.
- Promoting a healthy environment and sustainable urban landscape through urban horticulture and the Master Gardener program.

ATTACHMENTS: Semi-Annual Report – January - June, 2023

Riverside County Cooperative Extension



Semi-Annual Report – January-June 30, 2023

Board of Supervisors:

Kevin Jeffries, First District
Karen Spiegel, Second District
Chuck Washington, Third District
V. Manuel Perez, Fourth District
Yxstian Gutierrez, Fifth District

County Executive Officer

Jeffrey A. Van Wagenen, Jr.



UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources

■ UC Cooperative Extension



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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 Jan to June, 2023. Thank you for reading!

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:

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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 Series

Beginning in October 2022, our team launched a new monthly Science & Art Night workshop series in collaboration with the Behavioral Insights Team (BIT) and the Consulate of Mexico in San Bernardino. These monthly workshops were open to local youth ages 5-18 and their families throughout Riverside and San Bernardino Counties in an effort to bring 4-H's research-driven programming to local communities with no fees involved. Each monthly workshop consisted of a different topic and interactive activity for the whole family to participate in. This kind of programming opens the door for underserved communities to be directly involved in 4-H activities temporarily and then further encourages them to be involved in our program year-round. After our October and November Science & Art Nights, the series continued throughout January, February, March, and April 2023 for a total of 6 workshops.

Science & Art Night #3 in January was focused on youth creating a "Vision Board" for the year. The purpose of the vision board was to "envision" long and short-term goals, and then putting the ideas together into a board that represented what those goals were and what steps to take to get there.

Science & Art Night #4 in February was focused on creating a Mexican flag out of an LED (light emitting diodes) circuit. Youth learned about the importance of their national flag and learned how to build an LED light circuit with only a battery, small LED bulbs, and aluminum foil. They also learned to identify the positive and negative charge on the small LED's and how to light them once connected.

Science & Art Night #5 in March was geared toward learning about Cesar Chavez and his fight for farm workers in California. For the monthly activity, youth and their families colored and assembled a giant "Si Se Puede!" poster with images of Cesar Chavez.

Science & Art Night #6 in April was a Day of the Child celebration including fun activities for youth, a financial workshop, a family dinner, and presentation of completion certificates and 4-H STEM backpacks for families who attended at least 4 of the 6 workshops in the series.



4-H Youth Development Program

Workshop Images

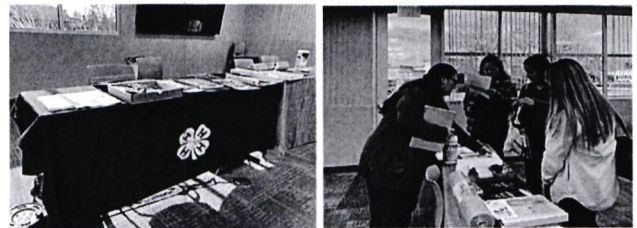


(Left) Youth pose with their completion certificates after Science & Art Night #4. (Middle) Families and youth pose for a photo during Science & Art Night #5. (Right) Family poses with their completion certificates during Science & Art Night #6.

Activities

Expanded Learning Resource Fair

On February 16, 2023, Riverside and San Bernardino County 4-H staff attended the San Bernardino County Superintendent of Schools Expanded Learning Resource Fair in Rancho Cucamonga as tabling presenters to share some of 4-H's curriculums with after school programs in both counties. During the tabling session, our program staff was able to share resources with after school programs, promote some of 4-H's curriculums and projects, and network with teachers.



Riverside & San Bernardino County 4-H Program Staff share resources with after school programs during the SBCSS Expanded Learning Resource Fair.

Fashion Revue/Home Arts Day in Hemet

During April, Riverside County 4-H hosted the annual Fashion Revue/Home Arts Day in Hemet. During this county event, youth representatives from all Riverside County 4-H community clubs are invited to participate in volunteer and youth-run workshops and to submit entries for prize consideration in many fashion and home arts categories such as: photography, fine arts, baked goods, baking, and fashion revue. The workshops run by our volunteers and youth included: a workshop for primary members (ages 5-8), leather work pouches, dandelion painting, and Kumihimo weaving.



Chicken leg cake pops created by one of our primary members Aubrey (Age 5).



Youth leader Abigail (Age 19) leads the leather pouch workshop and helps youth create their own leather pouches.

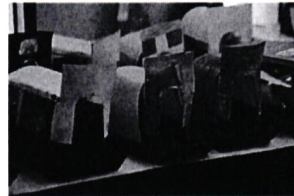
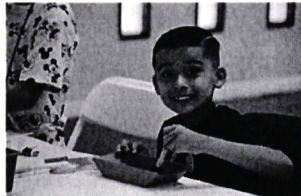


4-H Youth Development Program

Activities

Consulate Summer Program 2023

In efforts to expand 4-H programming to underserved and diverse youth in our counties over the Summer, our program staff planned, coordinated, and facilitated another annual Summer day camp from June 12 - July 14 at the Consulate of Mexico in San Bernardino. More than 40 kids ages 5-13 from both Riverside and San Bernardino counties attended 5 weeks of programming that directly focused on teaching youth about Mexico’s 32 states, their culture and traditions, and daily curriculums that included hands-on arts & crafts activities. Our staff recruited 5 student interns from local high schools and colleges including College of the Desert, UC Los Angeles, UC Davis, and UC San Diego. The Consulate Summer Program concluded on July 14 with an end-of-the-summer-program celebration and distribution of participation certificates and 4-H swag for all youth and volunteer participants.



(Left) Youth member Isaac (Age 7) painting the base of his boat, called a “trajinera” from Xochimilco, Mexico. (Middle) Completed “trajineras” made by youth entirely from scratch. (Right) Youth members, 4-H staff, volunteers, interns, and parents pose for a photo at the celebration of the end of the 2023 Consulate Summer Program.

Riverside County 4-H Summer Camp 2023

The annual Riverside County 4-H Summer Camp at Mt. Kare in Wrightwood took place from June 25 - July 1 this year as youth retreated to the woods for a week to partake in fun camp activities, group adventures, a skit night, yoga, movie nights, and much more! This year’s summer camp theme was “Once Upon a Camp”. Our youth members from different community clubs in Riverside County had the chance to have fun while sharpening their skills in a variety of subjects including archery, art, public speaking, and more.



(Left) Youth members pose for a photo near Mt. Kare’s hiking trails. (Middle) Youth members listen to instructions before an activity. (Right) Camp counselors pose for a photo in their “Once Upon a Camp” t-shirts on the last day of Summer Camp.



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Crop Production and Entomology

The focus of this position is addressing agricultural production needs and providing information for growers and pest control advisors to make informed decisions that are science based and applicable to the local production conditions. This position is also considered the lead advisor position for developing alfalfa insect information for all of California. As the Palo Verde Valley is unique in comparison with the rest of Riverside County, agricultural production systems present unique challenges that are also different than in almost all other parts of California, creating multiple opportunities for problem solving research that will immediately have impact.

Research

Research efforts this reporting period focused on insect control and mitigating heat stress on crop production. Eleven (11) replicated field trials were initiated in commercial production fields across the following crops: alfalfa, Bermuda grass, broccoli, teff and cotton. Several new insect pests of teff seed were the reason for the teff seed insecticide trial as growers and pest control advisors were in need of efficacy data to make decisions on pest control.

Meetings and Presentations

Educational priorities were organizing local educational meetings (5) on various agricultural related aspects (cotton insects, local research results, alfalfa irrigation, etc.) in addition being an 'in demand' presenter for information at multiple educational events for other entities on the topic of the two new insect pests of California alfalfa (4 presentations), including development of an educational poster. Other presentations developed and delivered included low desert horticultural insects for the University of Arizona La Paz County Master Gardener class, and sharing local cotton research at the Beltwide Cotton Conferences (New Orleans, LA).

The advisor also took the initiative to develop, organize and conduct the California State 4-H Insect Identification Contest held as part of the Field Day in Davis, California, in May, with 82 individuals participating.

Program recognition for program outputs included being chosen as the California state winner and subsequent addition western U.S. regional recognition for being one of the top three in the region from the National Association of County Agricultural Agents for a published photo, a fact sheet, and the alfalfa insect program.



Crop Production and Entomology

poster

Poster from the Statewide Conference

Two New Caterpillar Pests of California Alfalfa



Michael D. Rethwisch, University of California Cooperative Extension Crop Production & Entomology Advisor
Riverside County - Palo Verde Valley, 290 N. Broadway, Blythe, CA 92225 mdrethwisch@ucanr.edu (760) 921-5064

Two caterpillar pests new to California alfalfa production were discovered during past two years damaging alfalfa in fields in southeastern California.

These two insects were the alfalfa leaf-tier (*Dichomeris acuminata*), first found in Imperial Valley in fall of 2021, and the dot lined angle (*Psamatodes abydata*) in the Palo Verde Valley in fall 2022. Alfalfa being infested by the dot lined angle is of high significance as alfalfa had not been known as a host and represents a host plant expansion for this insect.

Alfalfa fields were more heavily infested by alfalfa leaf-tier in 2022 than in 2021. A much larger area of alfalfa fields was noted infested when compared with 2021 with distribution of such fields expanded by approximately 200 miles.

Both insect species are known to feed on various leguminous plants in addition to alfalfa.

ALFALFA LEAF-TIER
Dichomeris acuminata

Alfalfa leaf-tier caterpillars get their name from their ability and propensity to 'tie' alfalfa leaflets together. The caterpillars then feed within these leaflets, with their feeding resulting in loss of green photosynthetic material (Fig. 1). The tied alfalfa leaves also provide protection from predators and parasites, and makes insecticidal control challenging.



The alfalfa leaf-tier is a fairly small caterpillar reaching only about 1/3 inch (10 mm) in length. It is easily identified by completely sclerotized first thoracic segment and the 5 sets of prolegs (Fig. 2). The small size also noted in the adult moth (Fig. 3), which has some distinctive markings (Fig. 4).

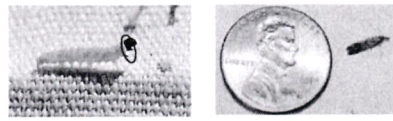
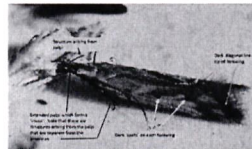


Fig. 2. Alfalfa leaf-tier caterpillar. Note completely sclerotized first thoracic segment.



Fig. 3. Adult moth compared with penny



DOT LINED ANGLE
Psamatodes abydata

Dot lined angle moths get their name from the adult moth which has an angled hind wing (Fig. 5) vs. a typical rounded wing, combined lines and dots on the wings. The caterpillars also have a line of dots on their sides (Fig. 6).

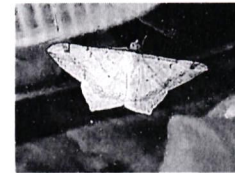


Figure 5. Adult dot lined angle moth

Dot lined angle caterpillars are inchworms (Geometridae) but are somewhat unique in that their markings change as they grow. Young caterpillars have green heads, a yellow stripe on each side, and a series of pale white stripes down the length of their back (Fig. 6a). As they grow a series of dots appear in a line on both sides (Fig. 6b), and with additional darker markings appearing below the dots in older caterpillars (Fig. 6c). Last instar caterpillars change colors and can range from pink to dark brown (Fig. 6d).

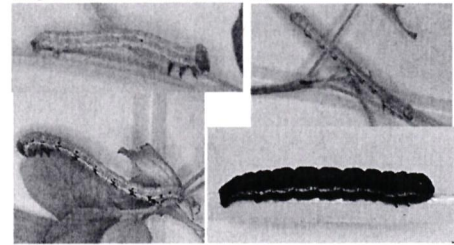


Figure 6.



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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 Olai.

Presentations and Program Expansion

Trees for Tomorrow Start Today

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 2,000 public and private urban foresters, landscapers, landscape architects and other ‘green industry’ professionals and Master Gardeners on the following topics: proper tree selection, placement and care; using reputable search engines to select climate-appropriate species; pest and disease prevention and management; and, impact of mulch and soil amendments on tree growth and development. I also received an internal grant from the Acting Associate Vice President of UC Agriculture and Natural Resources to develop an instructional printed toolkit, slides and short videos of the successful tree education/tree give-away program in San Bernardino County that is being expanded state-wide beginning in Riverside County Fall 2023. Through the program, short informal talks on climate-resilient species being given away are provided to tree recipients, with

regular follow-through by Master Gardeners 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 165⁰F to 100⁰F, 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.



The shade of a single tree can reduce temperatures of impervious surfaces (including artificial turf and dark mulches) during late spring and summer from 165 degrees F to 100 degrees F, reducing burns to humans and pets.



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.



Climate-Ready Tree Trial at UC Riverside led by Janet Hartin and other ANR and USFS colleagues.

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.



Janet Hartin
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Integrated Pest Management

My program deals with any pests that you can find inside or immediately around buildings such as bed bugs, cockroaches, termites, ants, fleas, flies, etc. I help pest control professionals, municipalities, counties, and housing managers with their pest control programs. I also provide state-approved pest control continuing education to licensed pest control technicians and inspectors. I have provided trainings to thousands of people on pest management best practices, and effective and safe pesticide application methods. I am a regular speaker at various professional pest control trainings in SoCal. I also help the general public with pest problems any time I can.

Meetings

This year has been a great year for my extension activities in the Riverside County. I spoke at four different meetings in the Riverside, Orange, and San Diego Counties, all of which with Riverside-based audience. It is a common practice my clientele group to cross the County line to receive trainings.

Meetings on pest control. Audience: >700 people

March 28 th	April 6 th	May 9 th	June 20 th
Riverside, CA: 32nd UCR Urban Pest Management Conference Resources; (UCR UPMC 2023).	Escondido, CA: Pesticide Applicators Professional Association training; Escondido Seminar - Thursday, Escondido Center for the Arts - 340 N Escondido Boulevard Escondido, CA 92025.	Redlands, CA - Redlands Seminar; May 9, 2023, University of Redlands, Orton Center, 1250 East Brockton Ave, Redlands, CA 92374.	Fullerton, CA: Pesticide Applicators Professional Association training; Fullerton Seminar , Fullerton Community Center, 340 W. Commonwealth Ave., Fullerton, CA 92832.

Meetings to promote safer and more effective pest control methods

May 3 rd	May 16 th	June 7 th
Pest Control Operators of California monthly meeting; Zacatecas Café, 3767 Iowa Ave	Public Health Annual Meeting and Training; Riverside Convention Center, #3637 5th St, Riverside, CA 92501	Pest Control Operators of California monthly meeting Zacatecas Café, 3767 Iowa Ave.

Integrated Pest Management

Research Projects

Dark rover ant management

Dark rover ant is a small but problematic ant species which enters houses time to time and can be seen in kitchens in the pantry, countertops, sinks, etc. This is sweet loving ant species which loves feeding on honey, syrup, sugar, juices, etc. Using several baits, I am conducting an experiment to see which bait product works best in this nuisance pest.

**SAN BERNARDINO & RIVERSIDE
PEST CONTROL
OPERATORS OF CALIFORNIA**

June 7th
5:30pm Social
6pm-8pm Meeting

**Unleashing the Power of
Integrated Pest Management**

Join us in welcoming Eric Veronick, a seasoned licensed operator in branches 2 and 3, holding QAL categories A, B, and I. Now serving as Enviro's California Area Sales Manager, Eric brings over 20 years of invaluable experience in the Pest Control Industry, where he has excelled in diverse roles.

With a passion for stewardship in the Pest Control world, Eric's expertise and in-field experience offer a unique perspective in his new position. He is dedicated to furthering the advocacy of the Pest Control and Public Health Industry, contributing to its growth and development.

ZACATECAS CAFE
3767 Iowa Ave,
Riverside, CA 92507

CONTINUING EDUCATION
1-Hour IPM

50/50 RAFFLE & DOOR PRIZE RAFFLE
Tickets can be purchased for our raffles. Attendees are encouraged to bring a raffle item.

NETWORKING OPPORTUNITIES
Catch up with co-workers new and old. Make new friends, ask questions and even trade leads!

**\$40
DINNER INCLUDED!**



Siavash Taravati, Ph.D., QAL, FR Branch II Area Integrated Pest Management Advisor UC Cooperative Extension, Riverside County 2980 Washington St., Riverside, CA 92504
Email: staravati@ucanr.edu
Webpage 1: <http://urbanipmsocal.com>
Webpage 2: <http://ucanr.edu/sites/socalurbanipm/>

Mosquito control using ovitrap stations

Mosquitoes are pests of public importance. They bite people day and night and can transmit dangerous diseases to humans and pets. Ovitrap stations are devices used to lure adult mosquitoes to a water-filled station to encourage them to lay eggs. At the stations, the mosquito eggs will hatch into an aquatic larva. Using an insect development disrupting chemical, mosquito larvae will be stopped from developing into adults and that's how the mosquito population can be controlled. I am testing one of commercially available products called In2Care which is a black bucket with a special design for attracting gravid mosquito females.

General Pest Session

- **SPCB Update** by Kathy Bayle, Structural Pest Control Board
- **Insecticides used in urban pest management and their modes of action** by Chao-Yang Lee, UC Riverside
- **Controlling German cockroaches with sprays and baits** by Michael Rust, Emeritus, UC Riverside
- **Use of biodegradable hydrogel to deliver boric acid liquid baits to control pest ants** by Dong Hyun Choi, UC Riverside
- **Tales from a Spanish sabbatical: peridomestic cockroach control** by Andrew Sutherland, SF Bay Area IPM Advisor, FVCC, Alameda County & UC IPM
- **Bed bug entrapment surface and its potential use for bed bug IPM** by Catherine Louder, UC Irvine
- **Adoption, alliance formation, and implementation of low-impact integrated pest management for urban pest ants** by Dong Hyun Choi, UC Riverside

Wood-Destroying Organism (WDO) Session

- **Economics and costs-benefits analysis for fumigation in California** by Vernard Lewis, Emeritus, UC Berkeley
- **Common violations in WDO jobs** by Tom Duvichon, Structural Pest Control Board
- **WDO update** by Kathy Bayle, Structural Pest Control Board
- **Important termite pests of California and their management strategies** by Chao-Yang Lee, UC Riverside
- **The use of an attractant may improve spot treatments targeting drywood termites** by Nicholas Poulos, UC Riverside
- **Less-known facts on the biology of the Western drywood termite (*Unisitermes minor*)** by Mariah Townsend, Area IPM Advisor, FVCC, Riverside County & UC IPM

UNIVERSITY OF CALIFORNIA Division of Agriculture and Natural Resources

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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.



Congratulations!

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

One of our judges enthusiastically remarked

“The Riverside Master Gardeners are modeling the very best in education - partnership, respect and hands-on teaching of quality material. Bravo!” (by Skylar Peters)

Search for Excellence Award

Their work within the Soboba Cultural Garden stood out as an extraordinary testament to the power of gardening in honoring cultural heritage and nurturing a vibrant community. The Search for Excellence competition takes place every three years and allows UC Master Gardeners to showcase their 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.

The goal of the Soboba Cultural Garden was and is still “To develop a cultivation system that is grounded in traditional tribal knowledge and connection to the land, while promoting food sovereignty and providing accessibility to health and wellness for its members.” Not only was the goal to provide food for the community but also to honor native plants, as well as medicinal herbs. The tribe had been gardening for countless generations here but needed some assistance getting back to the large crop yield they once had.



Vegetable harvest from the Cultural Garden ready for delivery to Preschool Chefs for lunches for students and elders.



Marilyn Howard, UC Master Gardener (left), teacher Eloyd Rodrigues, Cultural Garden Manager (right) what to look for in a new crop of lettuce.

Volunteer Recruitment

2023-2024 UC Master Gardener Volunteer Training began in March. During April and May, more than 150 community members attended the five Information Session. Two Information Sessions were held, at UCR Palm Desert Campus and two in the Riverside office, the fifth Information Session was held virtually. The class in will begin in September 2023 with 55 excited Master Gardeners in Training.



Master Gardener Program

Home and Backyard Show

UC Master Gardener Program began the year showcasing the UC Master Gardener exhibit at the Riverside Home and Backyard Show. A redesigned booth made the Master Gardener Information Booth an attraction not to be missed. Master Gardeners were available to answer questions and refer the public to science-based websites for information. During the three-day event, more than 600 contact were made. Three workshops were presented the show, 47 people attended the presentations. The topics included Water Efficient Gardening, Irrigation and Winter Vegetables.



Thurman Howard ready for the Riverside Home and Backyard Show in January 2023.

Growing Master Gardeners

The Master Gardener Advisory board approved a new project to increase volunteer participation in the program. The goal of the Growing Master Gardeners project was to inform and inspire Master Gardeners about

UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources

UC Master Gardener Program
Riverside County

YOU'RE INVITED!
UC Master Gardener of Riverside County are well educated about

Growing Master Gardeners
The goal of this new Master Gardener initiative, "Growing Master Gardeners" is to inform and inspire UC Master Gardeners about the UC Master Gardener Program of Riverside County and its mission of "extending to the public research-based information verified by UC experts about home horticulture, pest management, and sustainable landscape practices to the residents of all affiliated and invited to our core values and objectives."

Monday, March 6, 2023
9am-12pm

Please Sign up in the VMS Calendar
and join via Zoom
<https://ucanr.zoom.us/j/998027905107?pwd=TWB3UjVmbk9lcGpMTDZkS2x5dD15dD09>

the UCCE Master Gardener Program and its mission of “extending to the public research-based information verified by UC experts about home horticulture, pest management, and sustainable landscape”. As the Master Gardener volunteers’ focus on serving the public, this initiative will enable Master Gardener Volunteers to better satisfy the Master Gardener program mission. Master Gardeners contributed their expertise in surveying volunteer concerns and expectations about the MG Program, procuring speakers, and scheduling information sessions. Core topics covered during the Growing Master Gardener workshops included Public Speaking, Leadership skills and using VMS and Collaborative Tools. A total of 280 Master Gardeners participated the monthly virtual workshops. The workshops were recorded and are available to all Master Gardeners for future reference.

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Master Gardener Helpline
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Indio (Desert) :

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

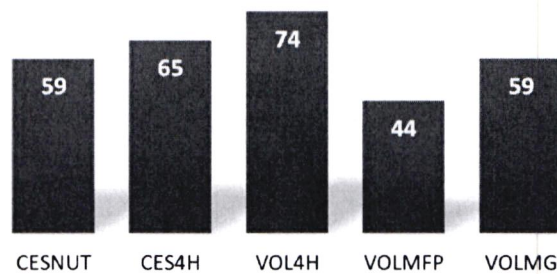
Household Food Waste Reduction project, has the overall aim to reduce household food waste among Californians, and it will be implemented in phases. The first phase involved creating a survey to conduct a needs assessment to better understand the current level of household food waste reduction awareness, attitudes, motivators, barriers, and practices of UCANR staff and volunteers in our statewide programs. These programs include the EFNEP, CalFresh Healthy Living UC, 4-H, Master Gardeners, and Master Food Preservers. The findings from this assessment allowed us to understand their readiness to educate consumers about reducing household food waste and, if needed, to develop appropriate training to prepare them to deliver food waste reduction messages, which will support consumer compliance with California’s short-lived climate pollutant reduction strategy (SB 1383).

Survey

During last six month, I conducted survey on California Extension staff and volunteers’ food waste awareness, attitudes, motivators, barriers practices, and readiness to provide food waste reduction education. This is the first study to survey all consumer-facing statewide programs in the Cooperative Extension system.

Awareness about the Short-Lived Climate Pollutant Strategy, SB 1383

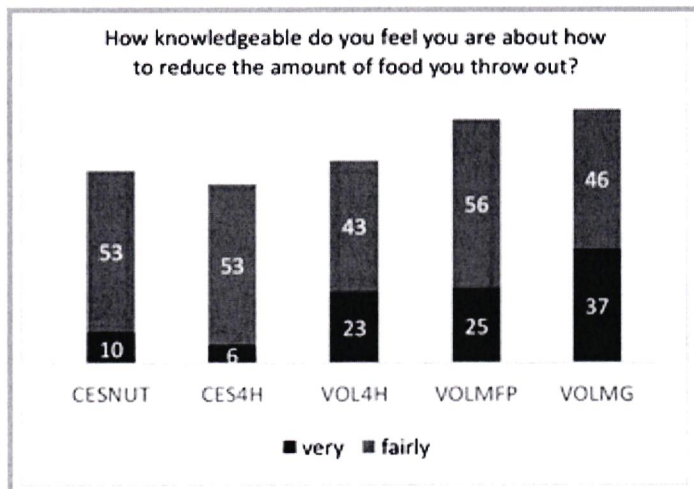
Never heard of SB1383 (% by program)



Community Nutrition and Health

Survey

The majority of survey respondents do not currently teach household food waste reduction strategies. The top two reasons are: 1) there is no curriculum or educational materials within their program to deliver; 2) there is no training. Our results confirmed that there is emerging need to develop and field test household food waste reduction messaging and educational material for our nutrition program clientele. We asked our survey participants what they thought the most effective method to educate their clientele about reducing household food waste would be. The top two methods identified were in-person classes & print materials. Additional methods identified were online modules and a Food Waste Reduction Challenge.



Next step: I plan to assess our nutrition program participants’ awareness, attitudes, motivators, barriers, and practices related to household food waste. There is limited research on understanding low-income household food waste practices and effective food waste reduction education and messaging. I secured funding from ReFED to conduct focus groups with low-resource families to understand their barriers to reduce food waste and their needs for education. This will help me develop materials and trainings for our educators.

Another research project: Assessing the Secondhand Effects of Substance Abuse Among Migrant Farmworkers will be my next focus for following six months. It looks at the stressors experienced with substance use exposure at work sites among farmworkers in Coachella Valley Riverside County.

Please contact me if you are interested to read the whole research report on food waste or interested in collaborating research and extension program in area of community nutrition and health.



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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.

Welcome

CFHL, UCCE welcomed three new **Community Education Specialists 2**, Vianca Nunez, Francisca Borbon and Alexander Prado to the Riverside team and Marlen Gaspar was reclassified from a CES 1 to a CES 2.

At Coachella Valley USD: The team meet regularly with the Nutrition Services team to plan and provide a district-wide Local School Wellness policy meeting. In April, the Palm Desert team wrapped up providing nutrition education and taste testing as part of the Fresh Fruit & Vegetable Grant with 4 schools in partnership with CVUSD Nutrition Services and CFHL, RUHS-PH, where students had the opportunity to taste 3 fruits or vegetables each week. As a result of the FF&V Grant, the team provided direct education with the summer school classes at Palm View and Valle Del Sol Elementary.

Adult School: The team started partnering with Alvord USD Adult School to provide the Plan, Shop, Save, Cook (PSSC) series in English and Spanish with English Learners. The Palm Desert team continued to partner and provide English and Spanish PSSC workshops with Coachella Valley Adult School with 5 classes.



Esmeralda & Vianca with CV Adult School PSSC Grads

Community Nutrition and Health

CalFresh Healthy Living, UCCE

Direct Education, Policy, Systems, and Environmental Activities

Coachella Valley USD Summer Meals Program

The CFHL team partnered, and Coachella Valley USD Nutrition Services Departments with their Summer Meals Program. CFHL implemented weekly CATCH physical activities with Banning USD in June, 2023.

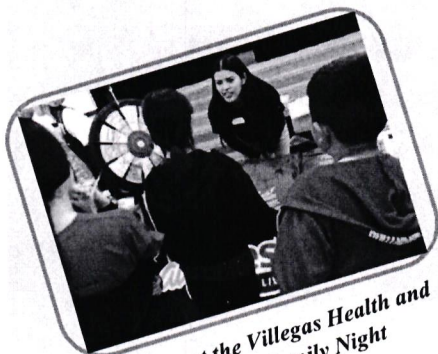


BUSD Summer Meals CATCH Activity

Torres Martinez

At Torres Martinez Desert Cahuilla Indian Reservation, the Palm Desert Team provided a Spring Planting Event in the A'Avutem Senior Garden and continue to partner with UCCE Small Farm Advisor Philip Waisen on the Backyard Garden/Fruit Tree projects. CFHL provided 6 Good Foods Healthy Minds workshops, while continuing with consultative monthly Community Wellness Committee meetings that focus on wellness goals for the tribal community in Thermal.

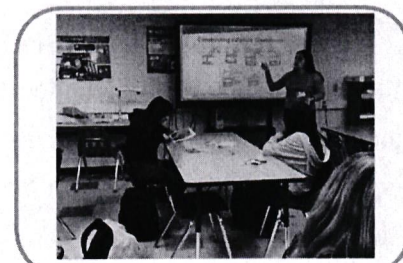
CFHL continues to provide monthly nutrition and physical activity lessons at Banning and Indio Department of Public Social Services (DPSS). In addition to supporting 9 school gardens and 3 community gardens and working across all grade levels with 6 school districts. CFHL participated in the Statewide Day of Action: Rethink Your Drink Day at 2 schools providing fun youth activities with tastings of healthy infused water.



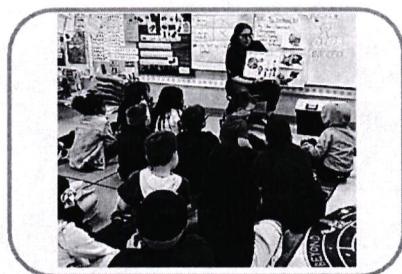
Marlen at the Villegas Health and Wellness Family Night



Marlen and Jackie at Banning DPSS



Jackie teaching TWIGS at Arizona Middle



Vianca at Cesar Chavez



Claudia and Jackie at Nicolet

Community Nutrition and Health

CalFresh Healthy Living, UCCE

Community Settlement Association

In spring 2023, the CFHL Riverside team led Community Settlement Association (CSA) Garden Club to produce 23 pounds of produce that was donated to the CSA Food Pantry, which distributes food to the community twice a week. The CSA participants are proud of the produce they donate, knowing that they are giving back to their community. In addition, CFHL, UCCE provided 6 Teams with Intergenerational Support (TWIGS) classes with food tasting. CFHL continued to partner with UC Master Gardeners (MG). MGs fixed the irrigation system and taught the Garden Club participants how to properly prep the garden beds before planting.



Marlen with CSA Champions

"I enjoy coming to CSA to spend time with the friends I met here. I enjoy the education classes and the gardens. I like learning from the educators that come to teach us".

-CSA Garden Club Champion

Appreciation

In early June, Esmeralda Nunez and Claudia Carlos were invited to a volunteer luncheon at **Cesar Chavez** Elementary in Coachella where they both were honored with certificates of appreciation and a the "La Causa" plaque "for living the Cesar Chavez legacy of educating our children and giving to the community".



Mealtimes and Smarter Lunchrooms Movement Smarter

The Palm Desert Team provided 14 Smarter Mealtimes (SMT) and a Smarter Lunchrooms Movement (SLM) interventions with pre & post assessments to influence students toward choosing healthier, more nutritious foods. SMT/SLM gives students an opportunity to select and consume a balanced diet while providing them with a spectrum of choices. The SMT/SLM applies research-based principles that use low or no-cost solutions with a focus on the cafeteria environment and the promotion of healthful eating behaviors.

Cal Fresh Living, UCCE Riverside Program Staff

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Community Nutrition and Health

Expanded 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

After being on hiatus for several year, the EFNEP Program in Riverside has reinstated the adult program. During the fiscal year, previous partnerships were reestablished and relationships with new partners began throughout the county.

The Eating Smart Being Active series was completed with 1 adult school and 1 school district reaching 67 participants in just a few short months. In addition, EFNEP participated in a health fair with the Soboba Tribal TANF providing nutrition education, healthy low cost recipes, and resources to over 100 families.



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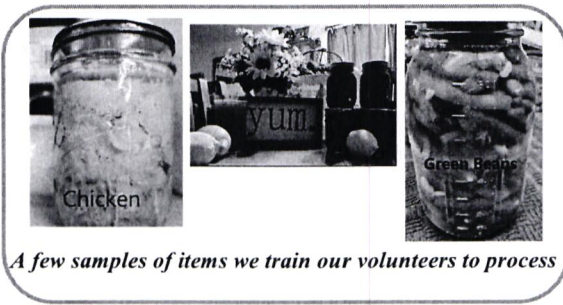
Roxana Price
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Community Nutrition and Health Master Food Preserver Program

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

UC Master Food Preserver Program’s mission is to keep Californians safe and well as they use culturally appropriate, researched-based practices to safely preserve food in the home, reducing food waste, increasing food security and providing engaging ways for Californians to explore healthy food. Here in Riverside we are building our volunteer team. We recently certified 8 Master Food Preserver Volunteers bringing our volunteer roster to 53 strong. During our certification course we train on the following preservation methods: fermentation, dehydration, boiling water canning, pressure canning and pickling and freezing. Although our program is new to Riverside, we have supported various events in past years and are working to build more relationships here in Riverside County.



2023 Certification Training



Denneigh Denton
Volunteer Services Coordinator for Master Food Preserver
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The Small Farms and Specialty Crops Program

The small farm of the Inland Empire focuses on the challenges and issues affecting small scale and specialty crop producers in the Inland Empire. The program aims to provide culturally and linguistically appropriate outreach in order to enhance the skills and abilities of socially disadvantaged, small scale, limited-resource, and specialty crop producers to make important management decision such as crop selection, variety development, sustainability, weed control, pest and disease management, irrigation practices, postharvest handling and storage, food safety, pesticide safety, marketing strategies, agritourism, financial and risk management, and more. The program fosters field research trials, educational programs, technical assistance, and publications that support and encourage the sustainability of diverse, thriving small farms. In addition, the program intends to strengthen connections between small scale and specialty crop producers and local and government agencies (USDA, CDFA) and programs to facilitate increased access to resources and program participation. The program support farmers in all phases of their farming business development to improve their farming operations.

Needs Assessment

To maximize the effective of our outreach programs, we are conducting a needs assessment of growers in the Inland Empire. The needs assessment includes questions related to agricultural workforce, drought impact, and general growers' needs. This assessment is funded by the Riverside Food Systems Alliance and is a collaboration between Chandra Richard (UCANR), Etaferahu Takele (UCANR), Kevin Grell (Pitzer College). In collaboration with the Inland Empire Resource Conservation District (Nancy Noriega and Lucy Ceja) and the Redland Natural Resources Conservation (Tomas Aguilar Campos), we conducted an in-person needs assessment workshop in Spanish for our small scale producers.

Workshops

We participated in three workshops. We hosted two workshops in Riverside County focusing on Palm that was attended by over 30 peoples. In addition, we were invited as keynote speaker for Climate Smart Ag Workforce Panel for the Grow Riverside Conference with over 100 attendants on March 30-31. We also presented on transitioning to controlled environment Ag-Green Houses and Hoop Houses. This event was attended by over 35 participants.



The Small Farms and Specialty Crops Program

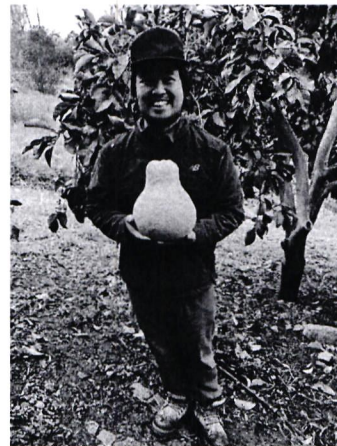
Extension and Outreach

We provided support to over 30 farmers in the riverside county. Our extension and outreach aim to provide technical support the socially disadvantaged producers. In addition, we also assisted these producers in grants applications to support their operation.

Program Images



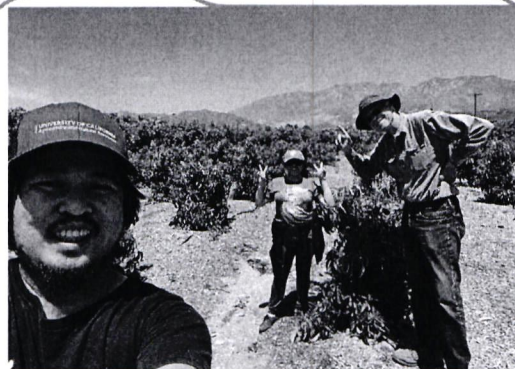
Land access and regenerative agriculture meeting in Riverside, March 22.



Sampling of Pomelo in De Luz Area.



Sampling strawberry for disease



High Density Avocado Experiment Evaluation



Hung Kim Doan
Small Farms & Specialty Crops Advisor
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Sustainable Agricultural Lands Conservation Program (SALC)

SALC is a statewide program offering planning, acquisition, and capacity grants to a diversity of applicants across city, county, and other 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 and project development grants after approval at the Strategic Growth Council meeting in April; full applications are due in August/September to the Department of Conservation (DOC).

Conference

Chandra and her Central Valley counterpart, Cristina Murillo-Barrick, presented to 105 people at the **Community Alliance of Family Farmers (CAFF) Conference** in February 2023 to highlight our work with the SALC program, showcase other California Climate Investment programs, identify how small-scale farmers can access state funding. They also introduced the SALC program at the California Native Plant tribal workgroup in January to 20 tribal members. They also provided a grant overview of the SALC program at the USDA NRCS Information Session with UC ANR. To inform colleagues and collaborators, they presented at the UC ANR Statewide Conference in April on advancing opportunity & equity through the SALC Program. Lastly, they were interviewed twice: by a UC Institute for the Study of Society Issues professor and graduate students on beginning farmers and transitions in California agriculture; and by a USC Master of Public Policy student about USDA programs, initiatives, policies, and land use issues.

On a local level, Chandra presented twice in March 2023 at the **Grow Riverside Conference & Beyond** (Riverside, CA) to Inland Empire land managers, planners, and community members. The first presentation was in a breakout session to present on the SALC program and highlight state funding, successes, opportunities, technical assistance, and grant guidelines to 40 attendees. The second presentation was the keynote panel discussion on the Climate Smart Agricultural Workforce and opportunities for the greater Riverside community and was attended by nearly all 200 conference participants. She also presented at the South Coast Research and Extension Center in May 2023 and updated the San Bernardino Farm Bureau at their June meeting.





Sustainable Agricultural Lands Conservation Program (SALC)

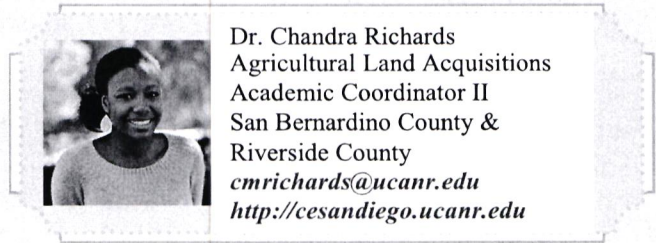
Because of her growing connections with planners, local governments, and resource conservation districts, Chandra worked with two key groups towards SALC planning grant pre-proposals this Round 9. This includes the **Southern California Association of Governments (SCAG)**, who host regular Natural and Farm Lands Conservation working group meetings. They were interested in aligning multiple themes (including coordinated land use planning, climate resilience, and co-benefit growth), all of which align with a SALC grant.

Chandra also **worked with the City of Oceanside and Mission Resource Conservation District**, the latter whose borders extend up to the Riverside County border and sphere of influence will spread into the Inland Empire region. They have been developing a strategic vision for their SALC planning grant to support the 3,500 acres of agricultural land in the South Morro Hills through agricultural easements, agritourism, and general plan updates to support the growing North San Diego County community. In all, Chandra met with 80 individuals through the Inland Empire regarding the SALC program, including non-profit organizations, water districts, cities, and California Native American Tribes (in-person and virtual). On the capacity & project development grants this Round 9, she supported several Inland Empire entities, several of whom will reapply this year to become an integral piece of the SALC program in southern California.

To ensure stronger representation from priority populations and underrepresented eligible entities, both Academic Coordinators made strategic

recommendations to the DOC for the draft Round 9 guidelines, which were released for public comment in February 2023. The State implemented many of these recommendations, including changing the grant award for acquisitions to cover up to 90% of the value of the agricultural conservation easement (previously 75%). They also made changes to better support California Native American Tribes, beginning and Veteran farmers and ranchers too; Chandra continues building relationships with these groups to inform them of SALC opportunities and provide technical assistance.

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 was in the final draft stage in March 2023. In May 2023, she also applied jointly with UCCE colleagues for the DOC Climate Smart Land Management Program to address equitable land access and land management diversification, boost capacity of underserved communities, and strengthen the scale of climate-smart action planning partnerships. In alignment with the California Conservation Planning Partnership, she will continue to work with key partners to host events in Southern California, develop strategic solutions, and secure funding for agricultural land protection and conservation.



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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.



Extension Highlights

A series of seminars on pest management practices for more experienced growers and pest control advisors were organized to provide research-based information and novel technologies in the areas of irrigation, pests, and disease management. A collaboration with wine grape growers in Temecula has included presentations in Spanish to educate farm workers on the identification, monitoring and control of the most important pests and diseases affecting wine grapes.

Research Activities

In the past few years, the Western grapeleaf skeletonizer (WGLS) *Harrisina brillians*, a destructive pest on grapevines has been detected in Temecula and San Diego vineyards and the potential of expanding to more vineyards is a concern. The larvae are voracious foliage eaters that leave the main veins behind after they feed on the leaves producing a distinctive lacy-skeletal pattern easy to recognize. As a response to the grower's concern, in the spring of 2023 in collaboration with the Temecula and San Diego wine growers, a monitoring program using this newly developed optical sensor trap was conducted. 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 app or web dashboard. Monitoring insects using traps with optical sensors is a promising alternative to regular sticky traps, but more research is needed. Currently there is no assessment of the status of the pest in the region and the goal of the project is to develop a research-based area-wide management program with treatment options. The information produced will be communicated to the growers to advise them the timing to start monitoring, and what treatment options are effective to control this pest.



Viticulture

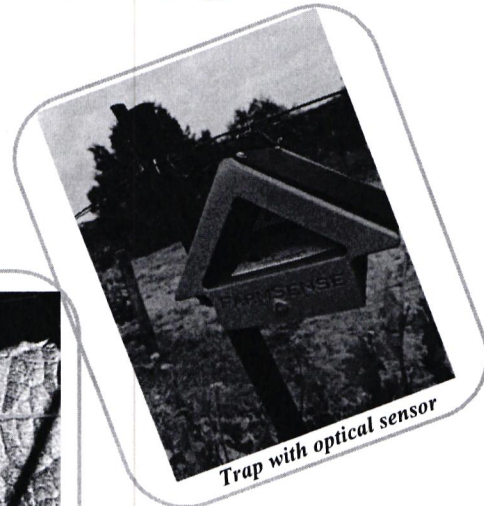
pest Management Images



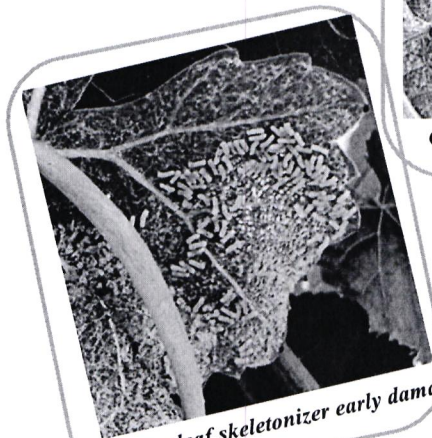
Sticky trap with adult grapeleaf skeletonizer



Grapeleaf skeletonizer eggs



Trap with optical sensor



Grapeleaf skeletonizer early damage



Grapeleaf skeletonizer damage



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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 \$334 million in 2020; 6% or \$20 million less than that in 2019. 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 including cole crops (broccoli, brussel sprouts, cauliflower, cabbage, and other brassicas), lettuce, carrot, celery, and artichoke among others are grown in Coachella Valley. Warm-season vegetable crops including bell pepper, okra, tomato, cucurbits, and eggplant among others. Our research and extension efforts are directed at addressing low desert vegetable crop production challenges with emphasis on pests and diseases but also including soil fertility, irrigation, and weeds. In the past 6 months, we have organized a vegetable grower meeting and a field day.

Research and Extension

We delivered a talk at a statewide Organic Agriculture Seminar Series, conducted 2 Master Gardener classes in Imperial and Riverside counties, conducted a statewide training to Climate Smart Agriculture CES, spoke at a Vegetable and Organic Production Workshop in Holtville, presented a research poster at ANR statewide conference and two 5-minute program introductory talks, presented at the 68th **annual conference on soil-borne plant pathogens and the 53rd California nematology workshop** in Salinas, presented at Southwest Ag Summit in Yuma, AZ, and presented at the 62nd Society of Nematologists Meeting in Columbus, Ohio. In addition, our oral presentation abstract and applied research poster have been accepted to present at the NACAA AM/PIC conference in Des Moines, Iowa in August.

Publication

A peer-reviewed journal article was published in Plant Protection Science (<https://doi.org/10.17221/86/2022-PPS>). This research paper presents findings on evaluating the efficacy of a biologically based products, Howler™ (*Pseudomonas chlororaphis*) and BotaniGard® (*Beauveria basiana*) on Plumeria rust pathogen.

Newsletter

4 newsletter articles were published in Imperial Agricultural Briefs

<p><u>January (Vol. 26, Issue 1)</u> The effects of reduced-risk selective nematicides on target and non-target nematodes in low desert vegetable production systems</p>	<p><u>March (Vol. 26, Issue 3)</u> Presents the findings on the soil health and nematode response to integrating Sudan grass rotation with reduced-risk nematicides on carrot in Imperial Valley;</p>	<p><u>April (Vol. 26, Issue 4)</u> The efficacy of a newly registered product, Senstar® on green peach aphid on lettuce in Coachella Valley</p>	<p><u>June (Vol. 26, Issue 6)</u> The effects of integrating root leachate and reduced-risk nematicide treatments on melon plant growth parameters in low desert growing conditions.</p>
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Vegetable Crops

Meetings and field day:

We organized 'Backyard Gardens Participants Meeting' in Thermal, Coachella Valley where participants were educated on pest and disease management, how to prepare vegetable starters or seedlings in trays, and what crops to grow in different seasons of the year (Figure 1a). In addition, we organized a field day that attracted more than 15 growers, pest control advisors, aspiring farmers, natural resource conservationists, and other stakeholders. As far as speaking at local and statewide clientele meetings, we delivered a talk at a statewide 'Organic Agriculture Seminar Series', conducted 2 Master Gardener classes in Imperial and Riverside counties, conducted a statewide training on nitrogen management to Climate Smart Agriculture CES, spoke at a 'Vegetable and Organic Production Workshop' in Holtville, presented a research poster in addition to delivering two 5-minute talks at IPM and Vegetable Workgroups at ANR Statewide Conference in Fresno (Figure 1b). As far as the national meeting, we delivered a talk at the 68th annual conference on soilborne plant pathogens and the 53rd California nematology workshop in Salinas, CA, presented at Southwest Ag Summit in Yuma, AZ, and presented at the 62nd Society of Nematologists Meeting in Columbus, Ohio (Figure 1c). Going forward, our oral presentation abstract and an applied research poster have been accepted to present at the NACAA AM/PIC conference in Des Moines, Iowa in August.

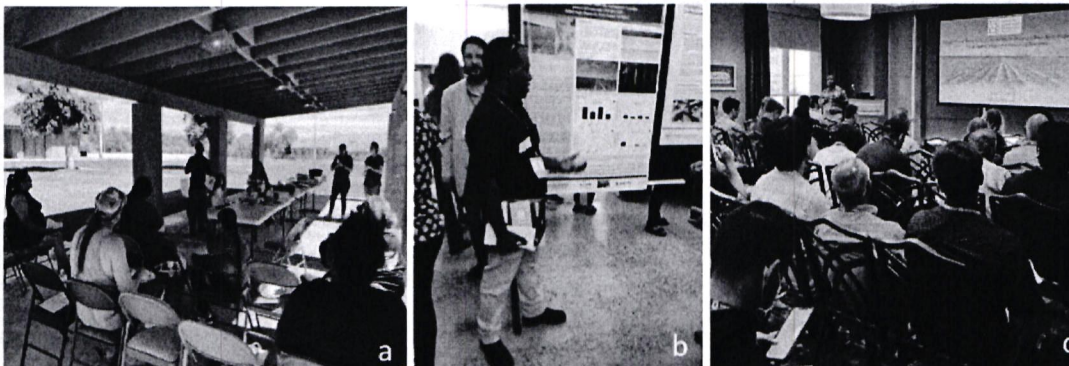


Figure 1. Showing a) backyard garden participants meeting in Thermal, b) ANR Statewide Meeting poster presentation, and c) speaking at the Society of Nematologists Meeting in Columbus, Ohio.

Laboratory space

Since we relocated our lab space from Indio location last year, we are still working to fully establish our laboratory space at UCR Palm Desert campus. The sink and lab benches have just been put up. In the meantime, we are operating out of a trailer field laboratory space at CVARS facility.



Vegetable Crops Project trials

A trial evaluating the effects of nematicides including Salibro®, Majestene®, VelumOne®, and an untreated control on okra is currently undergoing at the UCR Coachella Valley Research Station (CVARS). In addition, a trial evaluating the biofumigation effects and nutritional benefits of broccoli refuse on bell pepper is at the final stage of completion (Figure 2a). Furthermore, a trial evaluating the effects of integrating root leachate and nematicides is about to be terminated at CVARS (Figure 2b). As far as the completed projects, a carrot nematode trial and two lettuce trials evaluating the effects of various organic and conventional products have been completed. A field scientist from Valent had visited our field experimental site at CVARS (Figure 2c).

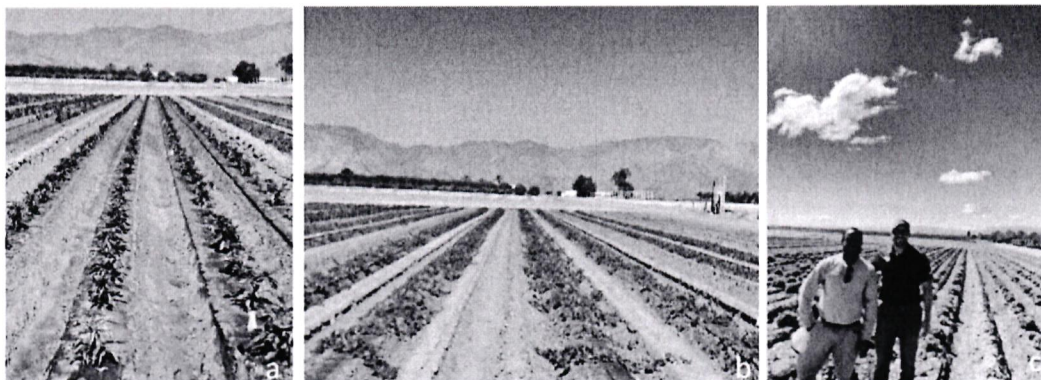


Figure 2. Showing a) bell pepper field trial, b) cantaloupe field trial, and c) Valent company representative field visitation of lettuce insecticide efficacy trials in Coachella Valley.

Honors and Awards

Our poster has been selected both as the California state and western regional winner for Applied Research Poster category to be presented at the annual National Association of County Agricultural Agents in Des Moines, Iowa in August, 2023 (Figure 3).



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EFFECTS OF REDUCED-RISK NEMATOCIDES ON TARGET AND NON-TARGET NEMATODES IN LOW DESERT VEGETABLE CROPPING SYSTEM
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INTRODUCTION
Plant root nematodes (phylum: Nema) are soil-dwelling parasitic nematodes that cause significant economic damage to agricultural crops. In the Coachella Valley, nematode infestations are a major concern for growers. This project aims to evaluate the efficacy of reduced-risk nematicides (Salibro, Majestene, VelumOne) compared to a conventional nematicide (Fenamiphos) and an untreated control. The study also assesses the impact of these nematicides on non-target nematodes, including beneficial soil fauna and other nematode species.

RESULTS
The study demonstrated that the reduced-risk nematicides (Salibro, Majestene, and VelumOne) were effective in controlling target nematodes (G. pallidus) while having minimal impact on non-target nematodes. Fenamiphos and the untreated control showed higher levels of both target and non-target nematodes. The results suggest that reduced-risk nematicides are a more sustainable and effective option for managing nematode infestations in low desert vegetable cropping systems.

CONCLUSION
This study demonstrated that the reduced-risk nematicides (Salibro, Majestene, and VelumOne) were effective in controlling target nematodes (G. pallidus) while having minimal impact on non-target nematodes. The results suggest that reduced-risk nematicides are a more sustainable and effective option for managing nematode infestations in low desert vegetable cropping systems.

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Waisen, P., Wang, X., Trnka, J., and Wain, K. (2023). Effects of reduced-risk nematicides on target and non-target nematodes in low desert vegetable cropping systems. *Journal of Nematology*, 55(1), 1-10.

Figure 3. Showing a poster that won western regional and national ranking at the National Association for County Agricultural Agents meeting in Des Moines, Iowa.



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.



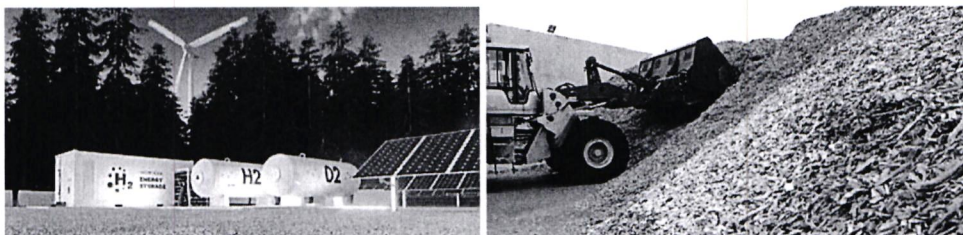
Non-merchantable woody biomass



The Dixie Fire in 2021

ARCHES-Renewable Clean Hydrogen Energy Systems

I have been actively involved with the Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES) in California as a working group member in Hydrogen Derivatives. ARCHES is California's public-private hydrogen (H₂) hub consortium to accelerate the development and deployment of clean, renewable H₂ projects and infrastructure. Towards that end, we contributed to the ARCHES application to the U.S. Department of Energy (DOE) grant to serve as California's hydrogen hub by providing technical and policy advice and writing the proposal. I am now working on producing a white paper focused on Hydrogen Derivatives that will be essential to California's success in building a clean renewable future.



Hydrogen production from woody biomass is a mature technology



Woody Biomass and Bioenergy

ARCHES-Renewable Clean Hydrogen Energy Systems

Since June 2023, I have been working with ATIP Foundation to develop two grant applications under the CAL FIRE grant program. The first application is for Business Development program and the other for Workforce Development. The grant applications will focus on launching the “California Wood Product Innovation Campus” at two locations (Southern Sierra, San Bernardino), described as an innovative, industry-driven business development program to catalyze a robust bioeconomy “supply chain”. The aim ultimately is to facilitate creation of multiple campuses within the San Joaquin Valley, Central and Southern Sierra, and San Bernardino regions.

Presentation

On June 2nd, I delivered a presentation at **UC President’s Advisory Commission (PAC)** on the potential of transforming California’s abundant woody biomass into “green hydrogen,” a renewable energy alternative. There were approximately 50 PAC Members who attended the meeting, and the audience were very interested in green hydrogen and the potential of using wood-based products as a renewable alternative to fossil-based products. At the same time, the committee was also concerned about regulations that may hinder forest activities but agreed that UCANR should continue to make these efforts. Future speaking engagements include an invitation from the Rural County Representatives of California at the joint RCRC/CSAC/CalCities event on August 30th.



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**UNIVERSITY OF CALIFORNIA
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April 2023

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