Riverside County
Cooperative Extension

Semi-Annual Report – July 1-December 31, 2021

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CONTENTS

Visit our offices in Moreno Valley, Indio 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) 683-6491

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, 2021. Thank you for reading!

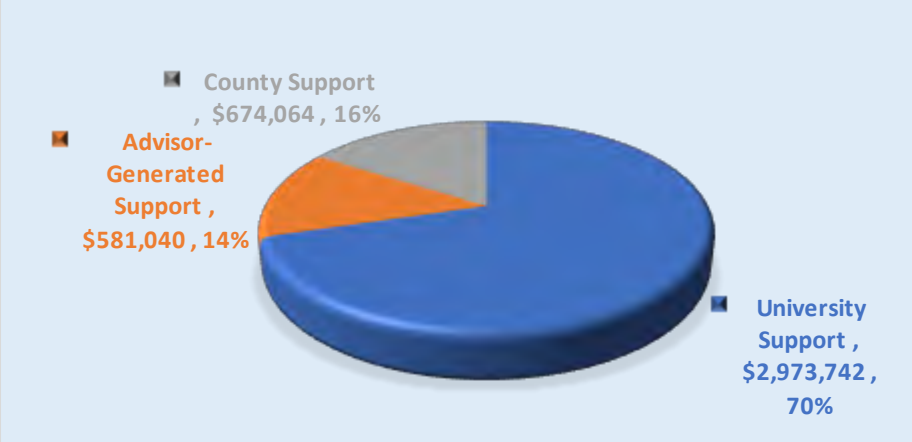
Rita Clemons
County Director
(951) 683-6491

Email: rlclemons@ucanr.edu
ceriverside@ucanr.edu
Web: ***http//ceriverside.ucanr.edu***

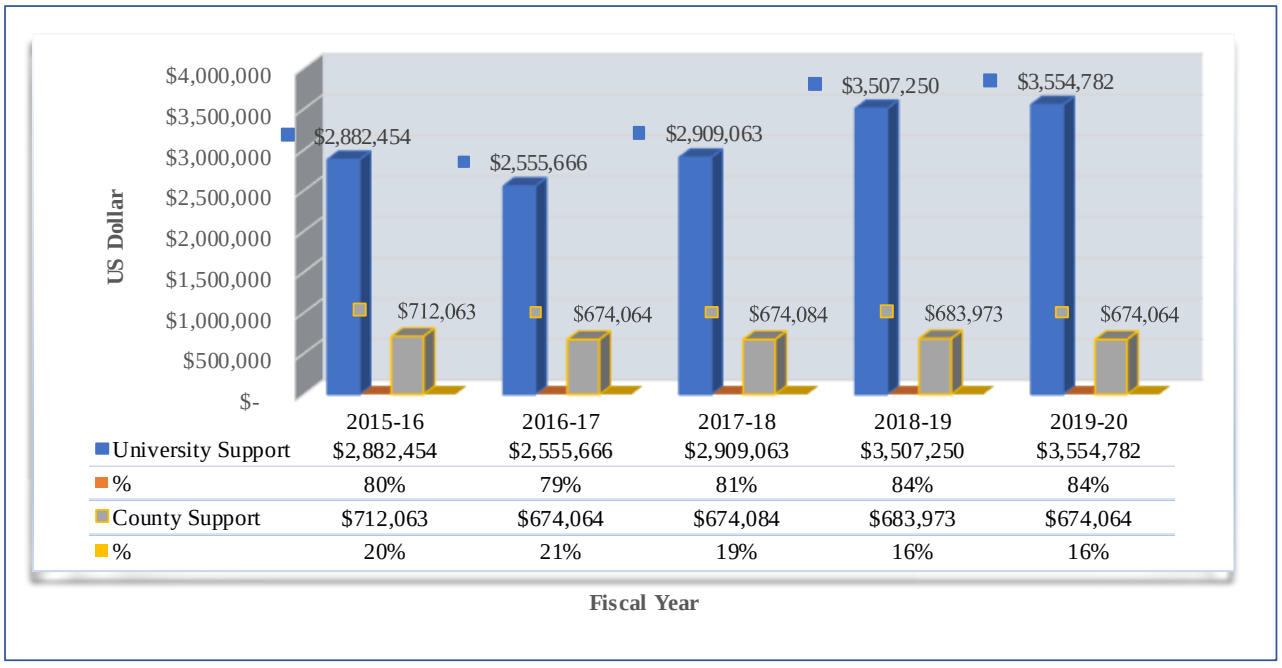
Cooperative Extension (CE) Budget by Fund Source

Budget for Fiscal Year 2019-20, UCCE Riverside County

University	$	2,973,742	70%
Contract & Grants	$	581,040	14%
County	$	674,064	16%
UCCE Riverside Total	$	4,228,846	100%



Cooperative Extension (CE) Budget; FY 2015/16 to 2019/20 (5 years)



4-H Youth Development Program

Riverside County 4-H Youth Development program serves youth ages 5-19 and promotes hands-on, experiential learning for youth from all backgrounds and locations. Our clubs, camps, in-school, afterschool, and special interest programs encourage leadership and responsibility and teach life skills and community involvement while the youth try new experiences. The program is led by faculty, staff, and volunteers from the University of California Division of Agriculture and Natural Resources (UC ANR), a statewide network of 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 and are connected to their communities.

Activities

For the 2021-2022 4-H program year, clubs were focused on growth and rebuilding after a full year of virtual programming due to the COVID-19 pandemic. By December 2021, 88% of 4-H Clubs had increased their youth membership from the previous year. Six clubs increased by over 50%, and two clubs increased by 100%!

July and August 2020

During the summer of 2021, 4-H youth, teen leaders, adult volunteers, and 4-H staff participated in one week of in-person day camp and two weeks of virtual camp. The July summer day camp, "Time Travel Around the World", allowed campers to "visit" Egypt, the Renaissance era, the Pacific Islands, and Africa. Youth participated outdoors in small cohorts to do hands-on activities and games. Youth who attended virtual camp learned skills like coding, self-defense, fire science, and mental health wellness strategies during the virtual camps.

September 2020

The Riverside County 4-H Ambassadors organized the annual Leadership Day. This year's theme was "Putting the Pieces Together". The sixty-seven 4-H members who attended learned about goal setting and planning and 4-H leadership positions. They worked together in teams in the escape room challenge.

October 2020

Even though the Southern California Fair was smaller due to COVID, 4-H members were able to see the culmination of their animal projects and participate in the Livestock show. Later in the month, members received their annual achievement awards during the Spooky Awards Night.

4-H Youth Development Program

November 2021

Community Service and Civic Pride is a cornerstone in the 4-H youth development program. Clubs in Southern Riverside County participated in the Veterans Day Parade and created cards to send to veterans.

CONGRATULATIONS!

The Riverside County 4-H Academic Advisor, Claudia P Diaz Carrasco, was awarded the Diversity & Inclusion: Expanding the 4-H Audience Award by the National Association of Extension 4-H Youth Development Professionals for her work and research to improve equity, inclusion, and diversity in Riverside County youth.

December 2020

Winter Coding Camp was offered to all 4-H members on the 11th and 12th of this month. Members were able to choose to learn Scratch block coding, Python coding, or how to code Micro:bits or Sphero robots.

Primary members ages 5-8 had their own Art Night where they completed two holiday projects to keep or give as gifts.

Claudia P. Diaz Carrasco
4-H Youth Development Advisor
cpdiaz@ucanr.edu

Stephanie Barrett
4-H Program Representative
slbarrett@ucanr.edu

Agricultural Economics/Farm Management

My assignment involves farm management economics in crop production in Southern California counties primarily San Luis Obispo, Santa Barbara, Ventura, Riverside, San Diego, and Imperial, as well as the limited crop production in San Bernardino, Orange and Los Angeles. In subtropical horticulture farm management economics, my work spans over to include the statewide industry. My responsibility is research and development of cost of production and profitability analyses and extending farm management knowledge and tools to growers for planning, evaluating and managing crop production to ensure profitably and viability. Allied industries also benefit from my programs such as using cost of production information for assessing property values and for business and financial transactions such as approving loans and determining leases. My program spans over multiple strategic initiatives including Sustainable Food Systems and Sustainable Natural Eco system (as it impacts agricultural production).

The Area Farm Management, Agricultural Economics program cooperated as a co-editor with the statewide subtropical horticulture farm advisors in the production of Topics for Subtropics, a statewide newsletter for disseminating research results and information related to new and improved production practices for the betterment of enterprise profits in Subtropical Crops. In the summer issue of Topics in Subtropics, the newsletter presented articles including Black Fig Fly, New invasive pest; Branch canker and dieback diseases associated with citrus in California; and Caloptilia, no longer a new pest.

https://ucanr.edu/sites/Farm_Management/Topics_for_Subtropics_Newsletters/

Presentation

- Presentation at the American Society of Horticultural Sciences (August 9, 2021): Profit potential investigated for High Density avocado production in California; nationwide and international participation
- Graduate students extension presentation judge (July 26 and August 1, 2021)—Nationwide participation

Publication

- Publish paper on avocado society digital magazine**: Investigating the Economic Feasibility of High Density Avocado Planting in San Diego County, 2020;**
- Updated Carrot and Watermelon production in California publication **for 7000 series publication,** (statewide program)
- Co-edited topics for subtropics newsletter (Spring edition and summer edition)—statewide program;

Etaferahu Takele , M.S., M.A
Area Advisor Farm Management/Agricultural Economics
ettakele@ucanr.edu

Crop Production and Entomology

Efforts this reporting period (July-Dec. 2021) have focused on:

Multiple insecticide trial evaluations involving a newly registered product for California alfalfa production so that best usage can be utilized by growers and pest control advisors (PCAs), including data collection and analyses. Comparing multiple herbicides for control of pigweeds and relatives threatening alfalfa production in the low desert. Presentations on alfalfa/forage production at multiple area/ western regional /national events. Extending information via newsletters (local and adjacent counties)

Mitigating summer heat effects on cotton and alfalfa production

Research

Data from July 2021 plot harvests (over 200 plots in the desert heat) was consistent with the previous year's results, which documented that certain biostimulant products can increase low desert dehydrator onion yields by over 5%, which is the first time such results have been noted over multiple years. This research also documented that product by growth stage interactions existed, which is important for future usage of certain products. A poster was accepted and displayed at 5th World Congress on Biostimulants in Agriculture ***(see accompanying poster).***

Alfalfa/forage crop entomology/production: Four (4) insecticide comparison trials were initiated during the reporting period. Plots were sampled multiple times, with yield data obtained from at least one field experiment (a fungicide x insecticide interactions study). While yields were not significantly improved by the treatments, an unexpected large increase in alfalfa quality (almost 17 relative feed value points) was documented from the fungicide inclusion which could have large economic implications for local growers.

Multiple presentations on alfalfa/forage entomology were made to growers and other extension professionals across several formats and states. The work being done in Riverside County coupled with the far ranging presentations has also lead to additional out of state invitation requests for assistance with educating growers in 2022, such as was done at the 2021 Western Alfalfa and Forages Symposium.

Other highlights in this area were the first identification of a new U.S. pest attacking alfalfa in Imperial and Yuma Counties (it has not yet been found in Riverside County), and the comparative heat mitigation work. Additional work is necessary to confirm the first year's data as results for quality/yield differed by cutting/ daylength. Data from the herbicide trial indicate distinct differences by product, and the data being generated will be important towards California registration of some products to keep local growers competitive with their Arizona counterparts.

Michael Rethwisch
Crop Production and Entomology
Advisor , Palo Verde Valley office
mdrethwisch@ucanr.edu

Please see Poster to the next page:

"Differential Dehydrator Onion Yield Responses Due to Various Biostimulants and Growth Stage"

Poster

DIFFERENTIAL DEHYDRATOR ONION YIELD RESPONSES DUE TO VARIOUS BIOSTIMULANTS AND GROWTH STAGE

Michael D. Rethwisch, Kassandra W. Allan, Lauren-Elizabeth Pope and Nathan J. Tribby

University of California Cooperative Extension, Riverside County, Palo Verde Valley office, 290 N. Broadway, Blythe, CA USA 92225 mdrethwisch@ucanr.edu (760) 921-5064

BACKGROUND

Production acres of dehydrator onions in the low desert of California are increasing. As is typical for most crops, it is also a crop for which biostimulant experimentation data is extremely limited, with just a few field trials conducted almost 20 years ago.

In the ensuing years many additional biostimulant chemistries and products have become commercially available, with no known replicated trials completed on low desert dehydrator onions for the products.

METHODS

In the past three years 5 replicated field experiments, utilizing large and/or small plots, were conducted and harvested to evaluate and compare various commercially available biostimulant products for their ability to increase dehydrator onion yields under California low desert production conditions.

For some experiment product rates and/or application timing relative to onion development were also included.

These trials were grouped into two main areas based on initial application:
1). At planting/early emergence *(late fall)*
2). Foliar *(when multiple leaves present)*

Additional information

Category	2018-2019	2019-2020	2020-2021
Replications:	4	4	6
Soil type:	Fine sandy loam	Silty clay loam	Silty clay
Variety:	Olam 41	Olam 41	Sensient
Plot sizes:	100 x 1,200 ft	25' x 4 beds	25' x 4 beds

GERMINATION/EARLY EMERGENCE TRIALS

In 2019 the first treatment was applied post planting but prior to germination water being applied via sprinkler irrigation. In the 2020-2021 experiment this early application was delayed until December 24 when seedlings were able to rowed (Fig. 2).

Treatments at this stage of development were:
A). 1 qt./acre of Guarantee Complex *(Ocean Organics)*

B). 2 qts/acre Liquid Seaweed Concentrate *(Acadian Seaplants LLC)*

C). 7 oz./.acre Penergetic *K (Penergetic Solutions)*

Fig. 2. Onions had emerged and were able to be rowed at application on December 24, 2020.

Foliar applications of the products were also made at 3rd and/or 5th leaf, with Penergetic P being applied at 3.5 oz./acre at 3rd leaf.

Yields were affected by rate of Guarantee Complex in 2020, as well as timing, as higher rates at 3rd leaf decreased yields, while applications at 5th leaf increased yields (Fig. 3). An additive effect of Liquid Seaweed Concentrate was noted both years, while a consistent numeric increase is yields was noted for the Penergetic treatment regimen (Figs. 3, 4).

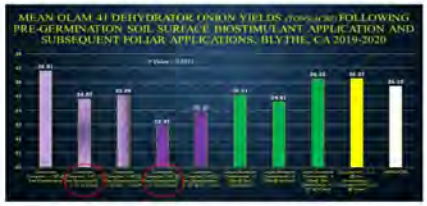


Fig. 3. Yields of dehydrator onions, July 2020.

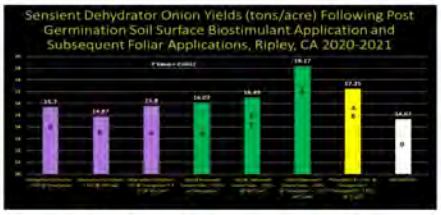


Fig. 4. Yields of dehydrator onions, July 2021

FOLIAR TREATMENT TRIALS

Large plot trials in 2019 evaluated 3 treatments of CytoPower (Mil Agro Inc.) applied at 3rd, 5th and 7th green leaf stages of development. Data from commercially harvested plots noted a significant yield increase for the 1.1 lb./acre rate (Fig. 5).

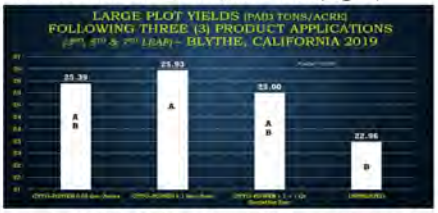


Fig. 5. 2019 Yields from three CytoPower treatments

Foliar trials in 2020 and 2021 compared multiple products, and rates. Two applications were made for most products in 2020 (3rd and 5th green leaf), and 2 and 3 applications (addition of 7th green leaf) in 2021.

Products evaluated in addition to CytoPower:
Action 6 oz./acre *(Stoller),*
Vitazyme 10, 13, 20, 30 oz./acre *(Vital Earth)*
GreenSol 48 - 8 oz./acre *(FRIT Industries)*
Advantigro 6 oz./acre *(Wilbur-Ellis)*
RyzUp SmartGrass 0.3 oz./acre *(Valent) 2nd leaf only*
Foliar Transit 10/8 oz. per acre@ 4th (2020)/3rd (2021) *(FBSciences)*

Several 2020 treatments were noted to result in 1+ tons/acre more yield than untreated onions (Fig. 5).

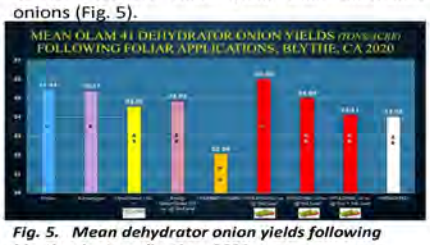


Fig. 5. Mean dehydrator onion yields following biostimulant application, 2020.

Data from 2021 compared 2 vs. 3 application of several products. Two applications for several products resulted in greater yields than three applications, but some products had higher yields with 3 applications (Fig. 6).

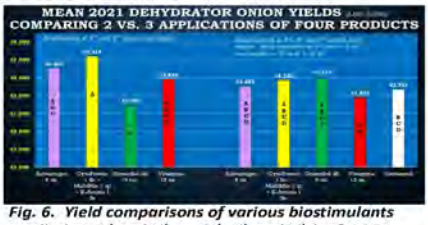


Fig. 6. Yield comparisons of various biostimulants applied at 3rd and 5th vs. 3rd, 5th and 7th leaf, 2021.

When comparing yields obtained from various biostimulant products for the two years, a consistent trends were noted.

Table 1. Mean dehydrator onion yields by treatment expressed as percentage of untreated onions.

Treatment	2020	2021	Average
Vitazyme 20 oz./acre @ 3rd leaf	104.8	108.2	106.5
CytoPower 1 lb./acre @ 3rd + 5th leaf	107.0	102.2	104.6
Advantigro 6 oz./acre @ 3rd + 5th leaf	103.0	105.6	104.3
Vitazyme 13 oz. /acre @ 3rd leaf	100.2	104.0	102.1
Vitazyme 13 oz./acre @ 3rd leaf + 5th leaf	99.5	100.4	99.9
RyzUp SmartGrass 0.3 oz./acre @ 2nd leaf	91.9	103.4	97.7
Transit Foliar 10/8 oz./acre @ 4th/3rd leaf	93.2	91.8	92.5

CONCLUSIONS

- Yields responses were fairly consistent over the two years for most products.
- Yield differences exist between products
- Interactions between onion development stage and product and rate exist
- The consistency of yield results over years while involving different dehydrator onion varieties provide high confidence levels for repeatable future results.

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 underserved neighborhoods. I also manage the Riverside County Master Gardener program and provide guidance and support to Volunteer Coordinator Rosa Olaiz.

Education/Training

'Trees for Tomorrow Start Today' Provided training to over 1,200 public and private urban foresters, landscapers, landscape architects and other 'green industry' professionals. Topics included tree selection, placement and care; using reputable search engines to select climate-appropriate species; pest and disease prevention, identification, and management; and, impact of mulch and soil amendments on growth and development.

Research/Extension

UC Cooperative Extension (Janet Hartin, Jim Downer, Alison Berry) and US Forest Service (Greg McPherson, Natalie Doorn, et al.) scientists are partnering 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 underplanted species of native and adapted non-native landscape trees. The project is in its sixthyear.

UC Cooperative Extension (Amir Haghverdi, Don Merhaut, Janet Hartin) scientists are measuring the growth, performance and health of several species of groundcovers and turf species under several levels of irrigation at UC Riverside (third year).

L-R: temperatures of black mulch, fake grass, asphalt, real grass in Palm Springs, CA between 3:25-3:30pm today

Master Gardener Program

I provided oversight for developing the syllabus and taught several of the classes during the 18-week Zoom class.

Janet Hartin
Area Environmental Horticulture Advisor,
UC Cooperative Extension, Riverside, San Bernardino, and Los Angeles Counties.
jshartin@ucanr.edu
(951) 313-2023
jshartin@ucanr.edu

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.

More than 13,700 Riverside County residents were reached by 318 UCCE Master Gardener volunteers through educational activities and events. The UC Master Gardener Program focused on providing education on edible gardening, drought tolerant landscaping, community outreach, and community and school gardens. Master Gardeners volunteered 8,188 hours in various events even when there were limited opportunities due to the COVID limitations. Master Gardeners became creative during the pandemic delivering horticulture education to the residents with virtual workshops, monthly eblast, social media and the creation of fact sheets for school gardens.

Master Gardeners had numerous opportunities to increase their horticulture know during the last six months. The Master Gardener Program offered 13 Continuing Education workshops and six book groups discussion. These activities allowed the MGs to increase their knowledge and share with the community. In addition, the MGs took advantage of virtual educational opportunities offered by Master Gardener Programs throughout the state. MGs logged 1,460 Continuing Education Hours during this period.

Master Gardeners at an Ask the Master Gardener Information Table

Fact Sheets can be found on the UCCE Master Gardener website

Master Gardener Program

On October 2, 2021, 34 trainees completed 50 hours of training, presented a gardening topic to the Master Gardeners and passed the final examination. In addition, they volunteered alongside Veteran Master Gardeners with hands on experience. More than 50 Veteran Master Gardeners, mentors and family members attended the graduation.

Riverside County Master Gardener Class of 2021

Riverside County Supervisor 2nd District Karen Spiegel attended the graduation and presented the graduates with a Certificate of Recognition

The Master Gardener Program began the second virtual Master Gardener Volunteer Training Class October 19 with 36 trainees. In their seventh week of training, they have volunteered 383 hours for various projects. This class of trainees bring numerous skills and experiences; the trainees' skills include graphic design, photography, public speaking, web designers, fundraising, blogging, event planning, research and many other skills.

UCCE Master Gardener at the California Citrus State Historical Park

During the last six months, two organizations requested assistance from the Master Gardener Program. California Citrus State Historical Park in Riverside and Raices Cultura (Cultural Roots) in Indio. Citrus Park board member Tom Spelling, requested assistance from the MG program to help with the care of the citrus at the State Park. Tom Spelling, Susan von Zabem, Friends of California Citrus Park Coordinator and Thurman Howard, UCCE Master Gardener led the new partnership. The goal is to teach MGs the proper care of the park's citrus, to provide hands on activities and train Master Gardeners to become park docents. Once trained, they will lead park tours through 200 acres of citrus and share information on the 240 citrus varieties. By summer, 2022 Master Gardeners will offer tours to the public.

Master Gardener Program

The second organization is Raices Cultura (Cultural Roots). Raices Cultural created a program, Tierra De Raices (Roots of the land). The focus of the program is to provide community education about sustainability and advocacy for a community garden to increase food access". The Master Gardener program offered horticulture education, guidance and consultation services to the participants and the staff on effective methods of growing edibles in the community garden.

The UCCE Master Gardener Home Gardening Basics (HGB) Committee held two Home Gardening Basic Classes. West Riverside County HGB Committee held a virtual class, the "California Fall Garden". The 4-series class focused on Beneficial Garden, Firescaping, Balance in the Garden and Edible Gardens. The Desert Area was a 5-part class with a focus on desert landscaping the class included the following topics: Landscape Design, Tool Safety, Veggies and Herbs, Citrus and Indoor Plants. 18 community members participated in the classes.

Desert HGB Class held at CREATE Center for the Arts in Palm Desert.

Comments
from Home Gardening Basics Class Participants:

- ***The presenters are quite knowledgeable and their time, organization and presentations are extremely informative and helpful. I have been greatly enriched by them. Thank you!! - LaVonne***
- ***I was blown away by the knowledge of the master gardeners and their generosity in sharing that knowledge. Can't wait for edible gardening class! Rick***

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

Master Gardener Helpline

Riverside County:
anrmgriverside@ucanr.edu

Nutrition, Family and Consumer Sciences

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.

After 22 years of serving Riverside County residents, Nutrition Advisor Ganthavorn retires

After serving Californians for over 22 years as a UC Cooperative Extension nutrition, family and consumer sciences advisor for Riverside County, Chutima Ganthavorn retired from UC Agriculture and Natural Resources July 1, 2021. Ganthavorn credits her success in improving nutrition education for Inland Empire residents to community partnerships, reliable funding and leadership support.

During her retirement, Ganthavorn, who has been granted the prestigious emeritus status from UC Agriculture and Natural Resources, plans to continue assisting the Torres Martinez Tribe with their Advancing California Opportunity to Renew Native health Systems (ACORNS) project. Chutima' continues to be deeply missed by the CFHL, UCCE team, but we are grateful for all the years of leadership, and dedication as a community wellness champion in the IE.

CalFresh Health Living

New Garden & Nutrition Elective Class at Villegas Middle

This school year, CFHL, UCCE Riverside was invited to lead a new Garden & Nutrition Elective class implementing our garden-based curriculum Teams with Intergenerational Support (TWIGS) with a 6th grade Career Technical Education (CTE) class at Villegas Middle in Riverside. Cohorts rotate every 12 weeks for a total of 3 cohorts a year. The Team expects to reach over 75 students by the end of the school year.

This fall's cohort #1 included 25 students who installed a two-wheelbarrow garden which they care for and used for TWIGS lessons outside their classroom. It has been gratifying to see the 6th graders take ownership of the garden. The students completed 16 TWIGS lesson that included both garden and nutrition activities and one UP4it lesson. Educator Daisy Valdez also arranged for virtual guest presentations from the Riverside County Department of Waste Resources. The presentations discussed the importance of reducing food waste and how to compost properly.

Nutrition, Family and Consumer Sciences

CalFresh Healthy Living;

During the 2021 fiscal year, the CFHL, UCCE Program, continued to focus in the school setting (pre-K and K -12). The Covid-19 pandemic resulted in hybrid implementation with some sites not allowing any visitors and other site welcoming in-person delivery. However, we were able to provide direct education to 5,025 youth, and 181 adults countywide. We worked in 38 locations of various locations and settings including 25 schools, 5 school districts, 9 Head Start/Early Child Education sites, 1 SNAP office, 1 community-based organization, 1 faith-based organization and 1 Indian reservation. We provided Policy Systems and Environmental (PSE) changes at 14 sites, including distributing seedlings and other materials to communities for home gardening and a virtual Youth Participatory Action Research Project (YPAR), reaching 1,808 participants through PSE assistance. We reached 8,959 participants with indirect program activities that include social media reach, nutrition education reinforcement items, hard copy and electronic materials and sustained 42 partners.

Thriving Community Garden

CFHL, UCCE has worked to reinvigorate the CSA back garden to produce over 50 pounds of fresh vegetables that were donated to the CSA food pantry with the help of the City of Riverside's Small Sparks Community Grant. Educators facilitate Garden Club meetings every other week to bring the community together safely outside to learn gardening skills, physical activity and growing food that feeds the Riverside community.

Esmeralda Nuñez,
Educator
eannunez@ucanr.edu

CalFresh Healthy Living Program Staff

From left to right:
Claudia Carlos, Program Supervisor, cfcarlos@ucanr.edu
Daisy Valdez, Educator, dlvaldez@ucanr.edu
Itzel Palacios-Sanchez, Educator, igpalaciossan@ucnar.edu
Nicole Ogosi, Educator, resigned Nov. 4, 2021
Jackie Barahona, Educator, jbarahona@ucanr.edu

CalFresh HEALTHY LIVING | UC CE UNIVERSITY OF CALIFORNIA Agriculture and Natural Resources

The Small Farms and Specialty Crops Program

My extension and research program focuses on the challenges and issues affecting small scale and specialty crop producers in the Inland Empire. My 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, my 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. I want to support farmers in all phases of their farming business development to improve their farming operations.

Winter \Vegetables Production

Fresh Market Strawberries

The Small Farms and Specialty Crops Program

To maximize the effective of our outreach programs, we first need to conduct a needs assessment. We are drafting a need assessment survey that we will be submitted to the Institutional Review Board (IRB) for review and approval. In addition, we have been reaching out to farmer, through email and social media, to introduce our program and services. We have been reaching out to different community organization (i.e., Inland Empire Resource Conservation District, CCOF Foundation, Community Alliance with Family Farmers) to establish a network to distribute out survey.

Virus disease of fresh market loop house tomatoes

Bacterial disease of fresh market loop house tomatoes

One of the main challenges facing new farmer is the cost of farming machinery. In collaboration with community organization, we are in the initial phase of developing a sustainable agriculture tool lending library. This will be a cooperative with other small scale and specialty crop grower to buy farm tools together and share them. Instead of spending for specialized machinery, small scale and specialty crop producers in the Inland Empire can now join a lending library of farm tools. With a small yearly subscription, producers can have access to farm machinery. This will lower the costs for both small scale and specialty crop producers as well as new and seasoned farmers.

Crop diversity on a small farm 1

Crop diversity on a small farm 2

Hung Kim Doan
Small Farms & Specialty Crops Advisor
University of California Cooperative Extension, San Bernardino & Riverside counties
hkdoan@ucanr.edu
Cell: (408) 717-0161

Subtropical Horticulture

The Subtropical Horticulture program has been recognized at the National Association of County Agricultural Agents Conference that took place virtually on July 6-9, 2021with state, regional, and national level awards for its efforts in research and extension. A two-day Virtual Symposium on the South American Palm Weevil was a success with over 260 participants within the two days. Approximately, 336 avocado growers took part in our last two quarterly avocado grower seminar series and there were 43 new avocado and citrus growers participated in the avocado and citrus production for new grower courses.

A two-year herbicide trial in avocados comes to an end. With these results, we are on the first step to try to expand herbicide labels for use in California avocados.

Riverside Subtropical Horticulture Program is Acknowledged at the National Level

The National Association of County Agricultural Agents (NACAA) is a national organization of professional extension educators organization is geared toward extension educators and other professionals who work in agriculture, horticulture, forestry and natural resources, 4-H youth development, community development, administration, aquaculture and Sea Grant, and related disciplines.

Active Members in good standing are eligible to apply for NACAA Awards and Recognition programs. As member of NACAA, Subtropical Horticulture Farm Advisor, Sonia Rios was presented with the "Early Career Achievement Award- National Winner 2021." This award is given to academics that have excelled in their research and extension program, while working for a Land Grant University less than 10 years.

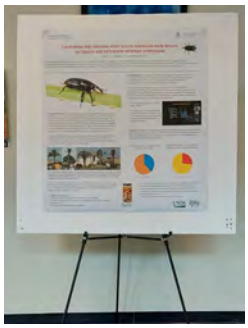
The Subtropical Horticulture Program was also recognized at the State, Reginal, and National level with other awards:

- Search for Excellence in Crop Production Award for her Annual Avocado Production Course for New Growers, State and Western Region Winner 2021.
- Team Newsletter Communication Award for quarterly "Topic in Subtropics Newsletter", State and Western Region Winner 2021.
- Applied Research Extension Poster Communication Award for applied research done on herbicides in avocados, State and Regional Winner 2021.
- Extension and Outreach Poster Communication Award for Asian Citrus Psyllid and huanglongbing outreach and extension for citrus growers, State Winner, Regional, and National Finalist 2021.

Published Photo Communication Award, State and Western Region Winner 2021

Subtropical Horticulture

Riverside Advisor represents California at NACAA Western Regional Conference



Rios traveled to Grand Junction Colorado to represent the state of California at the 2021 Chad Reid NACAA Western Region PIC that took place in person on October 4-6, 2021. Her outreach and extension poster titled "California and Arizona Joint South American Palm Weevil Outreach and Extension Webinar Symposium" was accepted and invited to be on display during the conference. Her poster also competed in the poster competition and placed 2nd.

South American Palm Weevil 2-Day Symposium

As a recipient of a Western Integrated Pest Management Grant, the Subtropical Horticulture program has delivered another two-day Symposium Webinar to create awareness and outreach. The symposiums provided training to mitigate the South American palm weevil's deleterious impacts to three target audiences: native habitat managers from public and private lands, urban ornamental tree growing and management sectors, including homeowners, and date producers. There were approximately ~135 participants that attended the symposium daily. Results determined that more than 99% of all attendees gained knowledge from the seminars and would use one or more management practice presented one of the seminars.

Free Avocado Grower Seminars

Every year the University of California Cooperative Extension, California Avocado Commission, and California Avocado Society host four seminars annually for growers. The most recent seminars that were held on June 10 had approximately 210 participants and August 17 had approximately 116 participants. Growers learned how to. mitigate heat in their groves and how to manipulate the avocado tree for optimum temperature and light.

Avocado and Citrus Production Courses for New Growers

Avocado: Throughout the summer, the avocado course began on Tuesday, July 6 and ended Thursday, August 19. The virtual sessions were held on Tuesdays and Thursdays during this time period. There were approximately 28 participants in this course.

Citrus: The citrus course started on Tuesday, August 24 and ended October 3. The virtual sessions were also help every Tuesday and Thursday and had 25 participants this year.

Growers learned about all aspects of citrus and avocado production.

Subtropical Horticulture

Avocado Herbicide Research Trials

Weed control in avocado does not get as much attention as in other crops. Leaf litter provides a mulch layer that with time helps suppress weed growth and if needed, glyphosate sprays are used to get rid of unwanted green vegetation. However, in young orchards there are sufficient resources for weed growth, even in the presence of leaf mulch. Recently, paraquat has been classified as restricted use material and glyphosate received a lot of attention for potential links to health issues, urging the users to seek effective and safe alternatives. This need for diversifying weed management was recognized by the California Avocado Commission that funded this project. The objective was to evaluate conventional and organic herbicides currently registered in avocado and those commonly used in citrus for safety and efficacy in bearing avocado orchard.

This project was in collaboration with other UCCE Advisors/Specialist: Ben Faber, Peggy Mauk and Oleg Daugovis.

Results This project showed that:

- Glyphosate provided superior weed control compared to other tested herbicides currently registered for avocado
- Herbicides that controlled germinating weeds had limited activity on established weeds (especially large weeds that produced seed), and may need 'burn-down' partner or mechanical removal methods for complete weed management program.
- When applied to the ground all herbicides were safe to avocado, however, in case of drift glyphosate was highly injurious to foliage while other herbicides were not.
- It is important to know weed species in the orchard and to apply pre-emergent herbicides to moist soil which ensures herbicide activity on germinating weeds.

This data has already been published in California Pest Control Advisor Magazine: https://capca.com/publication/adviser-magazine-december-2021/ and has also been shown as a scientific poster at the Weed Science Society of America, an International Professional Society in early 2021 and at the National Association of County Agricultural Agents Annual Conference.

Sonia Rios, M.S.
Subtropical Horticulture Farm Advisor
Riverside/San Diego Counties
sirios@ucanr.edu

Jasmin Candela
Subtropical Horticulture
Lab Assistant I

Sustainable Agricultural Lands Conservation Program (SALC)

This program focuses on the conservation of agricultural lands statewide and preservation of 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. A long-term community vision is needed to support agricultural communities, leverage existing programs, projects, and policies, and reinforce collaborative action to counteract trends.

Following onboarding in May-June 2021, Dr. Chandra Richards continued her role at UC ANR as the Agricultural Land Acquisitions Academic Coordinator II (AC) to support the mission of the Sustainable Agricultural Land Conservation Program (SALC) across San Bernardino, Riverside, and San Diego Counties. In the second quarter of her contract, she began working with the other recently-hired AC, Cristina Murillo-Barrick, who works across south San Joaquin Valley (i.e. Fresno, Merced, and Tulare Counties). More specifically, they became proficient in their roles by attending SALC workshops and working groups; gathering insight for their needs assessments; connecting with regional eligible applicants for SALC; and developing a database of SALC materials and resources as outreach and engagement opportunities are strengthened. The SALC program was in Round 7 of applications from June 2021 until closing in September 2021; awards were announced at the Strategic Growth Council meeting in November 2021.

Workshops

Chandra provided a brief overview of the SALC program at the San Diego Management and Monitoring Program monthly meeting in September 2021; the event was attended by 50 individuals virtually. She also co-hosted a "Supporting SALC" workshop with Cristina to highlight the successes and examples of the SALC planning and acquisition and host panelists at the City of Yucaipa, American Farmland Trust, and Department of Conservation who spoke about opportunities for increased agricultural land protection statewide. This workshop was attended by 50 individuals virtually.

Sustainable Agricultural Lands Conservation Program (SALC)

Research and Education

Chandra continued developing her technical expertise and advancing research, education, and outreach efforts throughout Southern California. She met with over 80 individuals virtually or in person and found that there are capacity needs at the city and local agency level throughout Southern California. Her meetings aimed to build relationships and determine how to build capacity, lower financial barriers, and improve outreach/engagement solutions for eligible applicants and stakeholders. She found that the economic cost of long-term agricultural land preservation is increasing because of escalating acquisition, endowment, and management costs and is exacerbated in Southern California as the cost of land and cost of living rise.

Riverside County is one county without either a SALC planning or acquisition grant. Chandra spoke with several city leaders throughout Riverside County (including in Riverside and Coachella) about efforts to support their initiatives. She also spoke with other agricultural leaders across the Inland Valley, including at the Riverside Food Systems Alliance, Riverside Farm Bureau, Western Riverside County Regional Conservation Authority, Center for Natural Land Management, Southern California Association of Governments, and Climate Science Alliance. She found that many of these leaders expressed interest in knowing more about SALC opportunities and therefore will expand engagement to include directed outreach materials addressing past project successes. She will also find ways to approach capacity limitations related to grant writing and support for disadvantaged communities.

Outside of her SALC duties, Chandra worked alongside a statewide hiring committee for an UC ANR urban agriculture and small farms advisor for the Los Angeles basin. She also supported planning efforts for a Forest Stewardship workshop in Southern California that addresses management and protection of private forest land; this workshop will include a portion on SALC-funded conservation easement and potential planning efforts. She will continue building her network of sustainability planners and conservation managers toward Round 8 of the SALC program in June 2022.

Dr. Chandra Richards
Agricultural Land Acquisitions Academic Coordinator II
San Bernardino County & Riverside County
cmrichards@ucanr.edu
http://cesandiego.ucanr.edu

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

An educational program for more experienced growers and pest control advisors was organized with the participation of University of California researchers to provide research based information and novel technologies in the areas of irrigation, pest and disease management. This program included presentations in Spanish to educate farm workers on the most important pests and diseases affecting wine grapes.

Glassy-winged sharpshooter, vector of Xylella fastidiosa bacterium to grapevines

Infested grape bunch with vine mealybugs

Infected grapevine with Pierce's disease

Viticulture

Research

Currently table grape growers depend on the use of a highly toxic plant regulator to break dormancy. This practice is essential for the Coachella Valley table grape growers to remain competitive in the international market by promoting uniform grapevine development and early harvest. In 2021, a non-toxic plant regulator material was registered in California. A research trial was conducted to test its effectiveness to break dormancy. The results are promising and could offer an alternative to the Coachella Valley table grape growers to reduce the exposure to a highly toxic material that is currently used.

In the area of pest management, identification, monitoring and development of control measures of invasive pests is a priority. Vine mealybug is the most threatening pest in vineyards worldwide and although it has been present in the Coachella Valley since the early 1990's, it continues to be a challenge to prevent contamination of fruit, particularly when fruit is exported overseas. A new strategy using a synthetic mealybug pheromone has shown reduction of the pest in other table grape production areas in California. The flight activity of the vine mealybug males (a key feature to understand the population dynamics) has been monitored for a couple of years. This information is essential and will be used in a research trial in the 2022 crop season to determine the timing and frequency of sprays to control vine mealybug in Coachella Valley table grape vineyards

Vine mealybugs under the bark of grapevines

Valley Pearl table grape treated with a new plant hormone

In addition, the monitoring program of the glassy-winged sharpshooter in vineyards and citrus has continued in collaboration with the California Department of Food and Agriculture. This sharpshooter is the vector of *Xylella fastidiosa*, a deadly bacterium causing Pierce's disease to grapevines. The good news in 2021 is that there are no records of the presence of the sharpshooter in the Coachella Valley.

Yellow sticky traps to monitor Glassy-winged sharpshooter

Carmen Gispert, Ph.D.
Area Viticulture Advisor
81-077 Indio Blvd. Suite H, Indio, CA 92201
cgispert@ucanr.edu
Mobile: 951-323-4006

The 2021 Award winners for NACAA (National Association of County Agricultural Agents)

Number Awards earned by Riverside County based Advisors

California NACAA Awards/Recognition - 2021

ARCHIEVEMENT AWARD (FOR THOSE WITH LESS THAN 10 YERS IN EXTENSIONS)

Sonia Rios - Riverside County

COMMUNICATION AWARDS

National Winner:

Feature Story	**Brooke Latack - Imperial County**

National Finalist (placed 2nd-4th Nationally)

Fact Sheet	**Apurba Barman - Imperial County**

Western Region Finalist (1 of top 3 in western region)

Computer Generated Presentation with script	**Michael Rethwisch - Riverside County**
Event Promotional Package	**Zheng Wang - Stanislaus County**
Newsletter	**Sonia Rios - Riverside County**
Published Photo	**Sonia Rios - Riverside County**
Website/Online Content	**Zheng Wang - Stanislaus County**

State Winner

Educational Video Recordings	**Zheng Wang - Stanislaus County**

EXTENSION PROGRAMMING (Search for Excellence)

State Winner ***(No regional competition, just state and national)***

Crop Production	**Sonia Rios - Riverside County**

POSTERS

Western Region Finalist (1 of top 3 in western region)

Applied Research	**Sonia Rios - Riverside County**
Extension Educuation	**Sonia Rios - Riverside County**

NACAA NATIONAL COMMITTEES/LEADERSHIP

Zheng Wang - Western regional vice-chair - Recognition and Awards Committee
(2 year term)

NATIONAL PRESENTATIONS (*highly competitive, only a few selected)*

Agronomy and Pest Management	**Michael Rethwisch - Riverside County**
Natural Resources	**Sonia Rios - Riverside County**

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DIVISION OF AGRICULTURE AND NATURAL RESOURCES (UC ANR)
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PUBLICATIONS REGARDING EMPLOYMENT PRACTICES
April 2021

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