UCCE Small Farms Research, Technical Assistance and Staffing Update

Ramiro E Lobo, Advisor, Small Farms & Agricultural Economics
Ariana Reyes, Community Education Specialist
Jan Gonzales, Supervising Community Education Specialist
UC Cooperative Extension, San Diego County

Escondido, CA – November 10, 2022
Presentation Overview

• Overview of San Diego County Agriculture and Farmers
• UCCE San Diego and the UC Small Farms Network
• Research and Technical Assistance Program Updates
  – Specialty Crops Research and Extension Update (Ramiro Lobo)
  – San Diego AgriTourism Story Map (Janis Gonzales)
  – Food Safety Technical Assistance Program (Ariana Reyes)
• Closing Comments, Q & A
Who are our Farmers?

**Acres Currently Farmed**
- 0 to 9 acres: 63.82%
- 10 to 49 acres: 20.43%
- 180 to 499 acres: 10.21%
- 50 to 179 acres: 3.83%
- 1,000 acres or more: 1.28%

**Acres Owned or Controlled**
- 0 to 9 acres: 11.30%
- 10 to 49 acres: 28.26%
- 180 to 499 acres: 4.35%
- 50 to 179 acres: 1.30%
- 1,000 acres or more: 0.43%

**Primary Role**
- Owner Operator: 80.08%
- Absentee Owner: 7.03%
- Farm/Grove Manager: 10.16%
- Agricultural Production: 0.78%
- Pest Control Adviser (PCA): 0.39%
- Other: 1.56%

**Production Systems Used**
- Conventional Farming and not in transition to organic: 36.40%
- Certified Organic Farming: 17.98%
- Organic Farming, but not “certified”: 16.23%
- Transitional to organic (actively implementing farming practices towards achieving organic certification): 8.33%
- Controlled Environment: 8.77%
- Mix (e.g. organic and conventional): 2.19%
- Other: 10.09%

University of California Agriculture and Natural Resources A Celebration of Science and Service
Motivators and Challenges Faced?

Major Challenges Identified

➢ Land and Water availability and prices
➢ Imports/Foreign Competition
➢ Growth and Urbanization
➢ Aging farmers/Succession planning
➢ Laws and Regulations
➢ Exotic pest problems/quarantines
➢ Farm labor supply, regulations and costs
➢ Declining profits (low prices/high costs)
All farmers (~5,700), farm managers and decision makers in the county with special emphasis on Small-scale (~77% of total) farmers as defined by the Census of Agriculture and the San Diego County Department of Agriculture.
UC Cooperative Extension (UCCE)

https://ucanr.edu/About/Locations/

- Serve every County in California
- Advisors work with farmers to develop and implement solutions for local problems in Agriculture, Natural Resources and Nutrition Education
- Strong volunteer involvement through Master Gardeners, Master Food Preserver, California Naturalist and 4-H Youth Development Programs
- Strong collaboration with federal, state and local government agencies and non-profit or community-based or organizations
UCCE San Diego

https://cesandiego.ucanr.edu/

AGRICULTURAL RESOURCES
✓ Small Farms & Agricultural Economics
✓ Climate Smart Agriculture
✓ Floriculture and Nursery
✓ Integrated Pest Management
✓ Ag Water Quality Research & Education
✓ Subtropical Fruit Crops
✓ Viticulture
✓ Human Wildlife Interactions
✓ Farm Management
PROGRAM AREAS:

✓ Business and Risk Mgt Education
   – Ag in Uncertain Times Online Education Program

✓ Agritourism and Direct Marketing
   – Agritourism Story Map & Agritourism intensive short-courses

✓ New Crops or Enterprises
   – Pitahaya, blueberry, coffee, other specialty crop research

✓ New Entry Grower Support & Education
   – Online Ag Business Resource Directory, Urban Agriculture,

✓ IPM and Pesticide Safety Education
   – IPM for Professional Landscapers Workshops

✓ Food Safety Education
   – CDFA Food Safety Technical Assistance Program
“Founded in 1979, the Small Farm Program seeks to enhance the viability of small & moderate-scale farms with the latest research-based information and extension education in production systems, marketing, and farm management.”
Research and Extension Update

- Specialty Crops Research and Extension
  - Pitahaya or Dragon Fruit IPM Field Survey
  - Coffee Production Research and Extension
- Food Safety Technical Assistance Program (Ariana Reyes)
- UCCE Online Agricultural Resources (Jan Gonzales)
Pitahaya/Dragon Fruit Pest & Disease Survey

Heidi Holmquist, Staff Research Associate
Ramiro E Lobo, Advisor, Small Farms & Agricultural Economics
UC Cooperative Extension, San Diego County

Funding provided by San Diego County OTO Internal Grant Program
Cactus Virus X (CVX)

- Common plant pathogenic virus that attacks many species in the *Cactaceae* family
- Found worldwide, first reported in Taiwan in 2003
- Found alongside other topomoviruses and potexviruses in some cacti species
- Reported and confirmed in California at South Coast REC in 2011, 85% percent of approximately 200 samples analyzed were positive for Cactus Virus X (CVX)
Materials and Methods

- **94 total samples** were collected from seven locations including research plots at UC-South Coast REC, one backyard grower and five commercial growers in Southern California
- Sample included **young and old/mature tissue** from symptomatic and asymptomatic plants
- **Duplicate samples** were collected, packed and shipped according to lab specification for virus and disease diagnosis
- Virus screening and sequencing was done by **Agdia** and pathogen/disease diagnosis was done by **Dr. Johana del Castillo** at UC Davis
Cactus Virus X (CVX) Samples and Symptoms
Varieties Screened for Cactus Virus X (CVX)

Count of Pitahaya Varieties Sampled

Pitahaya Varieties

American Beauty
Armando
AS-1
AS-10
AS-2
AS-3
AS-3L
AS-4
AS-5
AS-6
AS-7
AS-8
Asunta
Bien Hoa Red
Bien Hoa White
Cebra
Colombiana
Dark Star
Delight
El Grullo
Frankie's Red
Giant Vietnamese
Hailey's Comet
Hong
Julio's Cross
Laverne Red
Lisa
Maria Rosa
Moroccan Red
Natural Mystique
Orejona
Palora
Physical Graffiti
Purple Haze
Purple
Purple Red
Robles Red
Rosa
San Espinas
San Ignacio
Soul Kitchen
Sugar Dragon
Thai White
Unknown
Valdivia Roja
Vietnamese Giant
Vietnamese White
Voodoo Child
Cactus Virus X (CVX) Screening Results

Ninety one (91/94) or 96.8 % of the samples screened tested positive for CVX and only three (3/94) or 3.2 % of the samples were negative.
Cactus Virus X (CVX) Management

• Scouting for and eliminating symptomatic/host plants
• Regular testing, Isolating especially susceptible varieties
• Sanitation practices to avoid mechanical transmission
• Between each cut, decontaminating tools and surfaces with bleach or another disinfectant solution
• Removing all pruned plant material from growing area
Pitahaya Disease Diagnostics
Diagnostic work performed by Dr. Johanna Del Castillo and Dimitri Arndt-Truong at the University of California, Davis

79 Samples were collected in Spring and Summer 2022 from seven locations in Southern California

Sample composition included 76 stems, 2 fruits and 1 root sample.
Results

- Alternaria spp. was the most common pathogen genus recovered (52%), followed by Epicoccum sp. (18%) and Aureobasidium sp. (13%)
- Pathogens Colletotrichum sp. B. cactivora, and Phytophthora cryptogea had low recovery rates
- Despite being frequent worldwide, Neoscytalidium was not recovered
Disease Management

- Pruning/canopy management program:
  ✓ Sanitation pruning/remove inoculum source - Symptomatic stems/cladodes, fruits, flowers
  ✓ Production pruning/canopy management - Increases air flow, light and fungicide penetration

- In general, fungal diseases are favored by humid conditions:
  ✓ Irrigation management - avoid overwatering, limit canopy wetness
  ✓ Irrigation changes according to season

- Sanitation practices: Surface disinfest clippers, any tools used and clean gloves

- Use of copper preventatively → When is a good time to apply?

- Fungicides registered in Florida (limited to 4 applications/year):
  ✓ Azoxystrobin (FRAC group 11)
  ✓ Cyprodinil + fludioxonil (FRAC group 9 +12)
Conclusions

▪ Cactus Virus X (CVX) is endemic to pitahaya/dragon fruit plants in Southern California, yet impact of the virus on productivity and plant health unknown

▪ Alternaria spp. was the most common pathogen genus recovered (52%), followed by Epicoccum sp. (18%) and Aureobasidium sp. (13%)

▪ Some fungal species recovered are “new” pathogens of pitahaya in California (Alternaria spp., Aureobasidium pullulans, Epicoccum nigrum, Neodidymelliopsis spp.)
Conclusions

- It is possible that multiple pathogens are causing symptoms observed or making the plants more susceptible to CVX.
- There may be primary pathogens that make pitahaya crops more susceptible to saprophytes or secondary pathogens (Botrytis sp.).
- More research needed to:
  - determine real impact of CVX on Dragon Fruit and to develop protocols to clean produce virus free propagative material
  - characterize pathogen-host association/interaction in California to develop more specific management practices of known pathogens
Coffee (Coffea arabica) Research and Extension

Ramiro E Lobo, Advisor, Small Farms & Agricultural Economics
UC Cooperative Extension, San Diego County

Collaborators:
Duncan McKee, Cal Poly Pomona
Valerie Mellano, Cal Poly Pomona
Scott Murray, Murray Family Farms
Ben Faber, UCCE Ventura
The Flower Fields
Climatic Requirements

- Coffee usually grows under partial shade as an understory crop, but adapts well to full sun
- Optimum temperatures range from 59 to 75 F (15-24 C), do not tolerate freezing temperatures
- Coffee plants like high humidity with well defined rainy and dry seasons
- Arabica Coffee grows better at altitudes between 3000-5200 feet; whereas Robusta grows from sea level to 3000 feet in tropical environments
Propagation Research
Field Research Activities

- Done in collaboration with growers and institutions:
  - Variety evaluation trial at Cal Poly Pomona (2 trials, 15 varieties)
  - Variety trial at the Flower Fields in Carlsbad (15 varieties)
  - Provided plants for Coffee Carbon Extraction Research at Whittier College/Scott Murray
  - Variety trials at UC South Coast REC in Irvine (15 varieties, companion crop to chirimoya, container grown)
  - Shade house trial at UC South

- Citizen science research with local organizations/groups:
  - California Rare Fruit Growers (CRFG, various chapters)
  - UCCE Master Gardeners
  - Individual growers
Results to Date: Cal Poly & Whittier College
Results to Date: The Flower Fields
Results to Date: South Coast REC
Results to Date: Citizen Science
What Have We Learned?

• Coffee nursery plants can be grown at a reasonable cost
• Coffee grows well and produces fruit in various micro-climates throughout Southern California
• When grown in full sun, coffee plants show abnormal growing habits and erratic behavior (multiple trunks, too much foliage, seasonality of bloom not well defined)
• Cherry production can be high but larger than normal percentage of floats, empty or hollow beans
• Pest incidence very low, primarily ants and mealy bugs, spiders
Future Research?

• Future research should concentrate on improving the cherry to green coffee ratio. Need to look at:
  ✓ Irrigation requirements and timing of irrigation
  ✓ Fertilizer requirements and timing/type of fertilizer
• Production systems research – companion crop to avocados, full sun, semi-controlled environments?
• Processing/fermentation methods – washed, honeys or naturals?
• Marketing strategies? Will not compete with Colombia or Brazil but can be successful if tied to agritourism or other direct marketing strategy
Focus on Quality!!
Ariana Reyes,
Community Education Specialist.
airyes@ucanr.edu
UCCE San Diego, Small Farms Program
Food Safety Technical Assistance Program
Supervisor: Ramiro Lobo, Small Farms Advisor
Background

San Jose State University
B.S Environmental Studies
Minor in Conservation & Resource Management
Compost Education Program
Food Safety Technical Assistance Program.
Food Safety Technical Assistance Program

Project Overview

Sacramento

Margaret Lloyd, Advisor
Yurytzy Sanchez, CES (S)
Pang Kue, CES (H)
Fam Fin Lee, CES (I)

Yolo, Sacramento, Solano
Farmer languages: E, S, H, I

Aparna Gazula, Advisor
New Hire, CES (C)
Paulina Hernandez, CES (S)

Santa Clara, Santa Cruz, San Benito
Farmer languages: C, E, S

Kirsten Pearsons, Advisor
Maria Orozco, CES (S)

San Luis Obispo & Santa Barbara
Farmer languages: E, S

Ramiro Lobo, Advisor (S)
New Hire, CES (S)
Ariana Reyes, CES (S)

San Diego
Farmer languages: E, S

Vong Moua, CES (H)
San Joaquin, Stanislaus, Merced
Farmer languages:
E, H, V, Lao, Thai, Cambodian

Meaghan Donovan, Program Manager (S)

Ruth Dahlquist-Willard, Advisor (S)
Lilian Thaoxaochay, CES (H)
7 Additional Staff, (H, S, P)

Fresno & Tulare
Farmer languages: E, S, H, P

Hung Doan, Advisor (V)
Rose Olivas, CES (S)

San Bernardino & Riverside
Farmer languages:
C, E, S, V, Korean

C = Chinese
E = English
H = Hmong
I = Iu Mien
P = Punjabi
S = Spanish
V = Vietnamese
CES = Community Education Specialist

Yolo, Sacramento, Solano
Farmer languages: E, S, H, I

Aparna Gazula, Advisor
New Hire, CES (C)
Paulina Hernandez, CES (S)

Santa Clara, Santa Cruz, San Benito
Farmer languages: C, E, S

Kirsten Pearsons, Advisor
Maria Orozco, CES (S)

San Luis Obispo & Santa Barbara
Farmer languages: E, S

Ramiro Lobo, Advisor (S)
New Hire, CES (S)
Ariana Reyes, CES (S)

San Diego
Farmer languages: E, S

Vong Moua, CES (H)
San Joaquin, Stanislaus, Merced
Farmer languages:
E, H, V, Lao, Thai, Cambodian

Meaghan Donovan, Program Manager (S)

Ruth Dahlquist-Willard, Advisor (S)
Lilian Thaoxaochay, CES (H)
7 Additional Staff, (H, S, P)

Fresno & Tulare
Farmer languages: E, S, H, P

Hung Doan, Advisor (V)
Rose Olivas, CES (S)

San Bernardino & Riverside
Farmer languages:
C, E, S, V, Korean

C = Chinese
E = English
H = Hmong
I = Iu Mien
P = Punjabi
S = Spanish
V = Vietnamese
CES = Community Education Specialist
Food Safety Technical Assistance Program

Project Overview (CONT.)

- There are over 70,000 farms in California.
- There are 7 Regional Produce Safety Inspectors in California.
- Challenges.
The Food Safety Modernization Act

• FSMA was signed into law in 2011 by President Obama. Its focus is prevention of food safety issues. There are 7 primary rules that make up FSMA.
  • Worker Training, health, and hygiene.
  • Agricultural Water
  • Biological Soil Amendments of animal origin
  • Domesticated and wild animals
  • Equipment, tools, and buildings
<table>
<thead>
<tr>
<th>Not Covered</th>
<th>Qualified Exempt</th>
<th>Fully Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Farm is not subject to any regulations of the Produce Safety Rule.</td>
<td>• Farm is not subject to most of the regulations of the Produce Safety Rule.</td>
<td>• Farm is subject to all regulations of the PSR.</td>
</tr>
<tr>
<td>• Keep sales records to demonstrate status.</td>
<td>• Must follow modified labeling requirements.</td>
<td>• Farm Supervisor or responsible party must attend a Produce Safety Rule Grower Training course by FDA.</td>
</tr>
<tr>
<td></td>
<td>• Keep sales records to demonstrate status.</td>
<td></td>
</tr>
</tbody>
</table>

---

![Diagram showing the steps for FSMA Produce Safety Rule](image)
Determining your status

Are your average annual produce sales over $25K?

NO

Your farm is NOT COVERED by the Produce Safety Rule.

YES

Are your average annual food sales over $500k?

NO

Do you sell more than half of your food to your Qualified End users?

YES

Your farm may be QUALIFIED EXEMPT from the Produce Safety Rule.

NO

Your farm is FULLY COVERED by the Produce Safety Rule.
Affordable Handwashing Station

Images from webstaurantstore

OSHA
Occupational Safety and Health Administration

University of California
Agriculture and Natural Resources
Thank You!

Produce Safety Alliance | CALS (cornell.edu)

University of Minnesota Twin Cities (umn.edu)

Food Safety Modernization Act (FSMA) | FDA

San Diego County Small Farms (ucanr.edu)
Online Agricultural Resources:
- Agribusiness Guidelines
- Agribusiness Resource Directory
- Agritourism Map Directory

2022 Farm & Nursery Expo
San Diego County Farm Bureau
November 10, 2022 • Escondido, CA

Jan Gonzales, Community Education Supervisor
UC Cooperative Extension, San Diego
https://ucanr.edu/sites/OAR/

- New online (desktop) tools intended to assist local growers in the San Diego region in their efforts to remain competitive by providing useful guidelines and resources
- Resources for beginning and/or diversifying agribusiness
- Public interfacing, interactive map to promote local agritourism
Guide to AgriBusiness & Resource Directory

Use left navigation pane to view information and links on topics for agricultural
• Business
• Production
• Marketing
AgriTourism Map Directory

www.AgToursSD.org

- Interactive
- Multiple Categories
- Grower self-defined Business Profiles
- Printable profile sheets
- Maintained in partnership with San Diego County Farm Bureau

From farms to Wineries and anything in between... This AgriTourism directory showcases places and activities that will help you discover and enjoy the beauty and bounties of San Diego County agriculture. Here you will find opportunities to explore farms during the different seasons and ways to experience locally grown foods, goods and events that many area farms and ranches provide throughout the year.

This online agri-tourism map directory is hosted by the UC Cooperative Extension in San Diego County in partnership with the San Diego County Farm Bureau and was developed with financial support from the County of San Diego. For comments or questions about the site please contact:
Remm Liles, UCCE Advisor at rlliles@ucanr.edu or Jen Gonzalez, UCCE Project Coordinator at jgonzalez@ucanr.edu or San Diego County Farm Bureau at sdcbf@sdfarmbureau.org.

Application created by the UCANR Informatics and GIS Statewide Program.
Categories of Types of Activities Offered

- Certified Farmers Markets
- Direct Wholesaler(s)
- Educational Activities
- Farm Stands, U-Pick, Garden Centers and Nurseries
- Farm Visits
- Recreational Activities
- Special Events
- Winery or Cidery

AgriTourism in San Diego

This is a story map directory of agricultural businesses in the San Diego County region, which are open to the public to purchase produce and products directly from the grower and/or participate in agritourism opportunities.

Agricultural enterprises open to the public for visits or tours of their agricultural operation.
AgriTourism in San Diego

This is a story map directory of agricultural businesses in the San Diego County region, which are open to the public to purchase produce and products directly from the grower and/or participate in agritourism opportunities.

Certified Farmers Market(s)
Direct Wholesaler(s)
Educational Activities
Farm Stands, U-Pick, Garden Centers or Nurseries
Farm Visits
Recreational Activities
Special Events
Winery or Cidery

Commercial agricultural businesses, which offer opportunities for the public to purchase produce, nursery or other agricultural products directly from the business either from farm stands, U-pick activities, garden centers or nurseries.

Business profiles are accessed on left navigation or by correlating clickable number on map.
Profile Page

- Users able to download and print Agritourism Business Profiles
- Includes:
  - map location
  - business details
  - crops, services, activities offered
Find more details about the Agritourism Directory Map at
https://ucanr.edu/sites/OAR/AgriTourism/

To add your Agritourism business to the map directory, upload your Agritourism Profile information on this online Survey (https://arcg.is/1W9fiH0)

Thank You!

Questions?
Contact Ramiro Lobo, relobo@ucanr.edu
or Jan Gonzales, jggonzales@ucanr.edu
Questions/Comments?

Ramiro E. Lobo
Small Farms & Agricultural Economics Advisor
UCCE - San Diego County
9335 Hazard Way, Suite 201
San Diego, CA 92123
Phone: 858.246.1860
Cell: 858.243.4608
E-mail: relobo@ucanr.edu
http://cesandiego.ucdavis.edu
https://ucanr.edu/sites/sdsmallfarms/