UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources

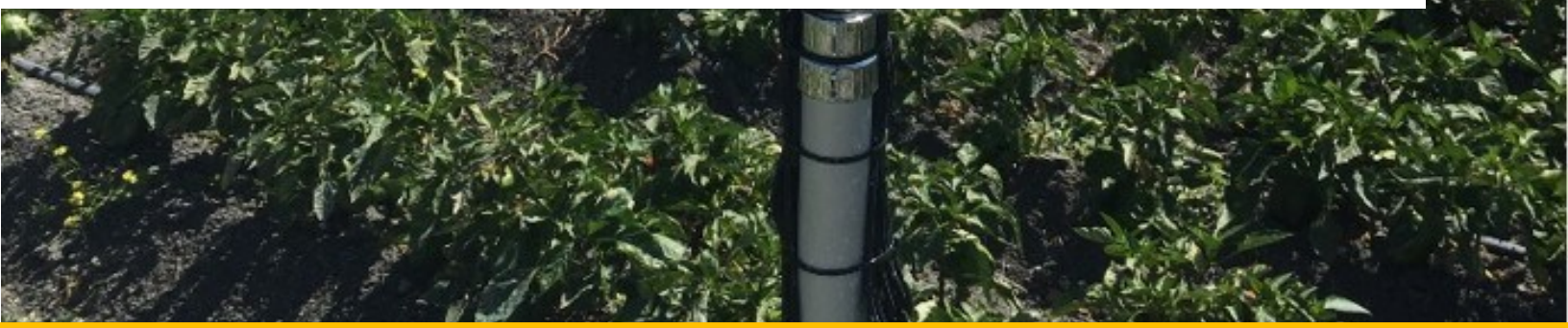
California Institute for Water Resources

The CLIMATE SMART AGRICULTURE PROGRAM at UC ANR

A partnership between the California Department of Food and Agriculture (CDFA) and the University of California Division of Agriculture and Natural Resources (UC ANR)

2019-2022 Report

cdfa CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE



CUMULATIVE RESULTS SINCE THE START OF THE PROGRAM

- 1,325 Growers Assisted
- 24 Counties Served
- 6 Languages Supported
- 100 Outreach Events

CDFA AND UC ANR PARTNERSHIP FOR CLIMATE SMART AGRICULTURE

SUMMARY

In 2019, the California Department of Food and Agriculture (CDFA) partnered with the University of California Division of Agriculture and Natural Resources (UC ANR) to create UC ANR's Climate Smart Agriculture Program.

This partnership provides funding for ten UC ANR Community Educators (CEs) to support the adoption of climate smart agriculture in more than ten counties in California. This program is funded by CDFA and California Climate Investments dollars through the Strategic Growth Council (SGC).

"Agriculture is an important part of the climate solution," Secretary Ross said. "This funding enables CDFA and UC ANR to partner with farmers to scale-up climate smart agricultural practices."

UC ANR is part of a network of technical assistance providers throughout California that support CDFA's climate smart agriculture initiatives.

CDFA Secretary Karen Ross and UC ANR Vice President Glenda Humiston form a CDFA-ANR partnership for climate-smart agriculture. *Photo by Evett Kilmartin.*

APPROACH

Through this program, UC ANR's Community Educators (CEs) provide in-depth technical assistance to farmers and ranchers to implement conservation management practices that build soil health, reduce water-use, and improve manure management.

CEs provide technical assistance for projects funded through CDFA's Climate Smart Agriculture Incentive Programs as well as projects voluntarily implemented by growers. Overall, the program supports climate smart agriculture efforts in California, including for socially disadvantaged farmers and ranchers.

For more information about UC ANR's Climate Smart Agriculture Program, please visit:
ciwr.ucanr.edu/Programs/ClimateSmartAg/

For more information about CDFA's Climate Smart Agriculture Incentive Program, please visit:
cdfa.ca.gov/oefi/

UC ANR CLIMATE SMART AGRICULTURE PROGRAM

GOALS

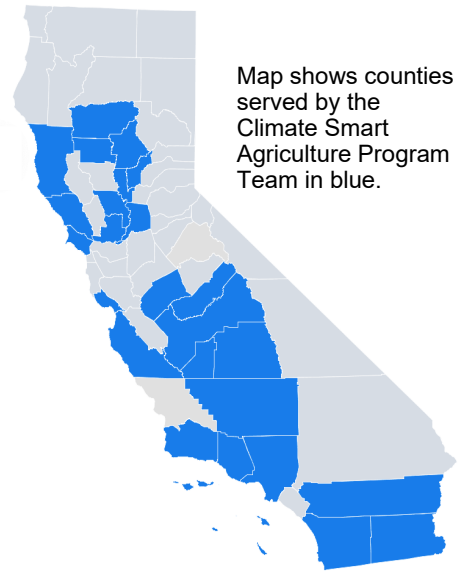
UC ANR's Climate Smart Agriculture Program increases the adoption of science-based climate-smart farming and ranching practices, supports climate change mitigation by reducing greenhouse gas emissions and sequestering carbon, and promotes climate change adaptation by increasing on-farm resilience. To date, the program has focused on key needs: ***Building Healthy Soils, Increasing Water Use Efficiency, and Improving Manure Management.***

ACTIVITIES

The program works directly with growers to provide ***outreach***, ***education,*** and ***technical assistance*** for implementing climate smart farming and ranching practices. UC ANR's Community Educators host workshops, provide grower consultations, conduct outreach, and offer direct support to growers who apply to CDFA's incentive and grant programs.

THE TEAM

The program is run by the California Institute for Water Resources (CIWR) within UC ANR. The team includes the CIWR Director, an Academic Coordinator (AC), three Regional Advisors (RA), and ten Community Educators (CEs) serving twenty-four counties in California.



Map shows counties served by the Climate Smart Agriculture Program Team in blue.

COUNTIES SERVED

Glenn	Mendocino	Solano	Tulare	Ventura
Tehama	Santa Cruz	Merced	Yuba	Santa Barbara
Butte	Imperial	Madera	Sutter	Los Angeles
Sonoma	Sacramento	Kern	San Diego	Fresno
Marin	Yolo	Kings	Riverside	

Erik Porse, CIWR Director	Hope Zabronsky, AC	Betsy Karle, RA	Ben Faber, RA	Ruth Dahlquist-Willard, RA
Caddie Bergren, CE	Amber Butland, CE	Amanda Charles, CE	Lizzeth Mendoza, CE	Esther Mosase, CE
Ana Resendiz, CE	Maria Ridoutt Orozco, CE	Heather Montgomery, CE	Nicki Anderson, CE	TBD, CE

BUILDING HEALTHY SOILS

SUMMARY

UC ANR's Community Educators work with growers to increase the adoption of soil health management practices that build soil organic matter and reduce greenhouse gas emissions. Such practices, including compost, cover crops, hedgerows, reduced tillage, and many others, help protect soil quality, increase agricultural efficiency and profitability, and promote resilience to climate change and extreme weather events.

HEALTHY SOILS PROGRAM (HSP)

CEs provide support to famers and ranchers applying to CDFA's Healthy Soils Program. To date, technical assistance from CEs has yielded 350 projects totaling over $24 million.*

350 Projects

$24 Million Awarded

271,000 MTCO2e Reduced over 3 years

*These efforts represent a subset of the total projects and funds awarded by CDFA. A full list of funded projects can be found on CDFA's website: www.cdfa.ca.gov/oefi/healthysoils/

A CE collects soil samples for a HSP project

Pre-Award Activities:

⇒ Conduct grower site visits and consultations
⇒ Host informational workshops and webinars
⇒ Produce outreach materials and attend grower meetings
⇒ Support submission of online applications, including workplans, budgets, and methods for quantifying benefits of projects

Project Implementation Activities:

⇒ Support all aspects of project implementation, verification, invoicing, and closeout
⇒ Host field days, workshops, demonstrations, and other education events
⇒ Coordinate with vendors, companies, and suppliers

WIDE ADOPTION OF SOIL HEALTH PRACTICES

Community Educators also support growers voluntarily adopting soil health improvement practices. Many growers have seen benefits of cover crops such as pest suppression, erosion control, reduced fertilizer inputs, and improved water retention.

Cover crops have allowed Central Valley Walnut Grower, Daniel Unruh, to reduce commercial fertilizer costs by 75% and increase soil organic matter by ~60% since the cover crops were established in his orchard.

Soil sample after years of cover crops

INCREASING WATER-USE EFFICIENCY

State Water Efficiency & Enhancement Program

SUMMARY

UC ANR's Community Educators (CEs) work with growers to increase the adoption of irrigation management practices that increase water efficiency, improve water quality and supply, and reduce agricultural greenhouse gas emissions. The program supports adoption and installation of efficient pumps with variable frequency drives, soil moisture sensors, electronic weather stations linked to irrigation controllers, evapotranspiration-based irrigation scheduling, drip irrigation systems, and low-pressure irrigation systems.

STATE WATER EFFICIENCY & ENHANCEMENT PROGRAM (SWEEP)

CEs provide support to famers and ranchers applying for CDFA SWEEP grants. To date, technical assistance from CEs has yielded 68 projects totaling over $7 million.*

68 Projects

$7 Million Awarded

44,300 MTCO2e Reduced over 10 years

8.3 Billion Gallons Water saved over 10 years

*These efforts represent a subset of the total projects and funds awarded by CDFA. A full list of funded projects can be found on CDFA's website: www.cdfa.ca.gov/oefi/sweep/

A CE hosts a grower field day with technical experts

A CE conducts a distribution uniformity test with a grower

Pre-Award Activities:

- ⇒ Conduct site visits and consultations
- ⇒ Conduct irrigation system assessments
- ⇒ Conduct outreach and education
- ⇒ Support applications, workplan and budget development, and quantification methodologies for prospective projects

Project Implementation Activities:

- ⇒ Support full project implementation, verification, invoicing, and closeout
- ⇒ Host field days, workshops, demonstrations, and other education events
- ⇒ Coordinate with irrigation companies, pump test companies, and equipment suppliers

ADOPTING WATER USE EFFICIENCY PRACTICES

Central Coast Farmer, Bob Kuang, grows 15 different Asian leafy greens in his greenhouse. He received technical assistance to design and implement new sprinkler heads and pipes in his operation. According to Kuang, the new irrigation equipment significantly improved vegetable growth on the property.

New sprinkler heads and pipes installed

IMPLEMENTING MANURE MANAGEMENT

Alternative Manure Management Program

SUMMARY

UC ANR's Community Educators work with growers to increase the adoption of alternative manure management practices that reduce greenhouse gas emissions from dairy and livestock operations. The program supports pasture-based management, alternative manure treatment and storage, and solid separation or conversion from flush to scrape in addition to drying or composting of manure.

ALTERNATIVE MANURE MANAGEMENT PROGRAM (AMMP)

CEs provide support to farmers and ranchers applying for CDFA AMMP grants. To date, technical assistance from CEs has yielded 9 projects totaling over $5 million.*

9 Projects

$5.6 Million Awarded

40,200 MTCO2e Reduced over 5 years

*These efforts represent a subset of the total projects and funds awarded by CDFA. A full list of funded projects can be found on CDFA's website: www.cdfa.ca.gov/oefi/AMMP/

Pre-Award Activities:

⇒ Conduct grower site visits and consultations
⇒ Host informational workshops and webinars
⇒ Produce outreach materials and attend grower meetings
⇒ Support online applications, workplan and budget development, and quantification methodologies for prospective projects
⇒ Connect growers to equipment suppliers and obtain project quotes

A CE helps a dairy farmer in Sonoma County

Project Implementation Activities:

⇒ Support project permitting, implementation, verification, invoicing, and closeout
⇒ Host field days, workshops, demonstrations, and education events targeted to dairy and livestock producers

METHANE REDUCTION CASE STUDY

Zuppan Dairy milks 600 cows in Glenn County and previously managed animal waste by scraping manure into a lagoon system. The dairy received an AMMP grant to cost share the installation and implementation of a manure solids separator. The project saved the dairy $13,000 annually on fertilizer costs and improved the dairy's ability to evenly distribute manure on its fields. The project is estimated to reduce methane emissions by 812 $MTCO_2e$ per year.

Solid separator and manure storage

SUPPORTING UNDERSERVED PRODUCERS

SUMMARY

An important goal of UC ANR's Climate Smart Agriculture Program is to provide tailored outreach, education, and technical assistance to small-scale, non-English speaking, and socially disadvantaged farmers and ranchers. To date, the program has supported over 1,300 small-scale and socially disadvantaged producers to understand and adopt climate smart agriculture practices.

514 Small–Scale Farms

315 Non-English Speaking Farms

355 Socially-Disadvantaged Farms

235 Priority Farms

Reaching Diverse Audiences

A CE holds a planting day for Spanish-speaking growers

Small-Scale: Those farming 500 acres or less.

Non-English Speaking: Translation is provided in six additional languages.

Socially Disadvantaged: A group whose members have been subjected to racial, ethnic, or gender prejudice defined by the 2017 Farmer Equity Act.

Priority Populations: Low-income communities, disadvantaged communities, and low-income households.

CEs provide tailored support to underserved, under resourced, and diverse growers that includes many types of activities. Throughout the state, UC ANR CEs work to:

⇒ Develop trusted relationships and connections with agricultural communities

⇒ Create and distribute outreach and educational materials in different languages and for different learning styles

⇒ Host workshops, presentations, and field days in multiple languages and provide translation services to growers

⇒ Translate grant materials and documents

⇒ Coordinate between growers and local vendors and suppliers

⇒ Provide computer and internet access

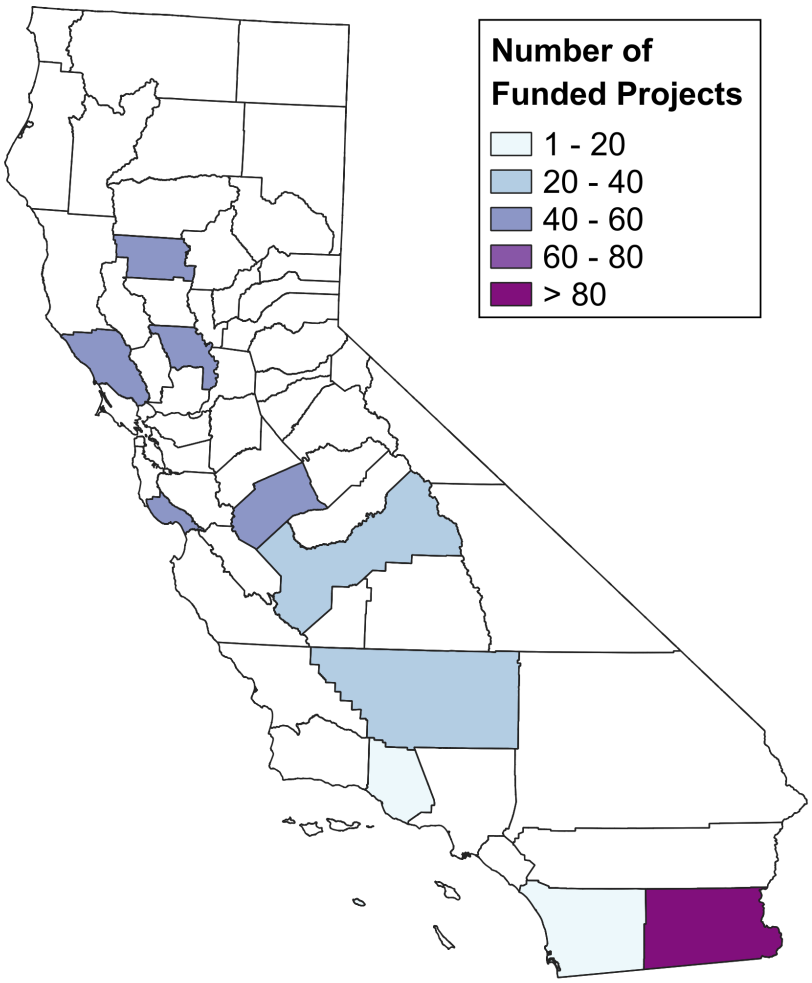
Language	# Growers Assisted
Cantonese	139
Spanish	91
Mandarin	33
Punjabi	30
Hmong	12
Chinese	10
Total	**315**

CEs have provided support in the languages above.

STATEWIDE IMPACTS

In counties served by UC ANR's Climate Smart Agriculture Program, from 2019-2022, CEs held 100 workshops and supported at least 420 successful grant applications.

Number of funded projects supported by UC ANR's Climate Smart Agriculture Program, by county



100
Workshops Held

2,341
Workshop Attendees

420
Awarded Projects

Most Frequent Types of Projects:
Composting
Cover Cropping
Range Planting
Irrigation Sensors
Improved Pump Efficiency
Solid Separation
Solid Storage

CASE STUDIES

Successful projects have reduced greenhouse gas emissions, saved water, improved soil health, and attracted pollinators through the implementation of HSP, SWEEP, and AMMP practices in the ten regions of California served by the UC ANR Climate Smart Agriculture Team.

AMMP Project: Glenn County

A manure solid separator keeps solids out of the manure pond.

SWEEP Project: Merced County

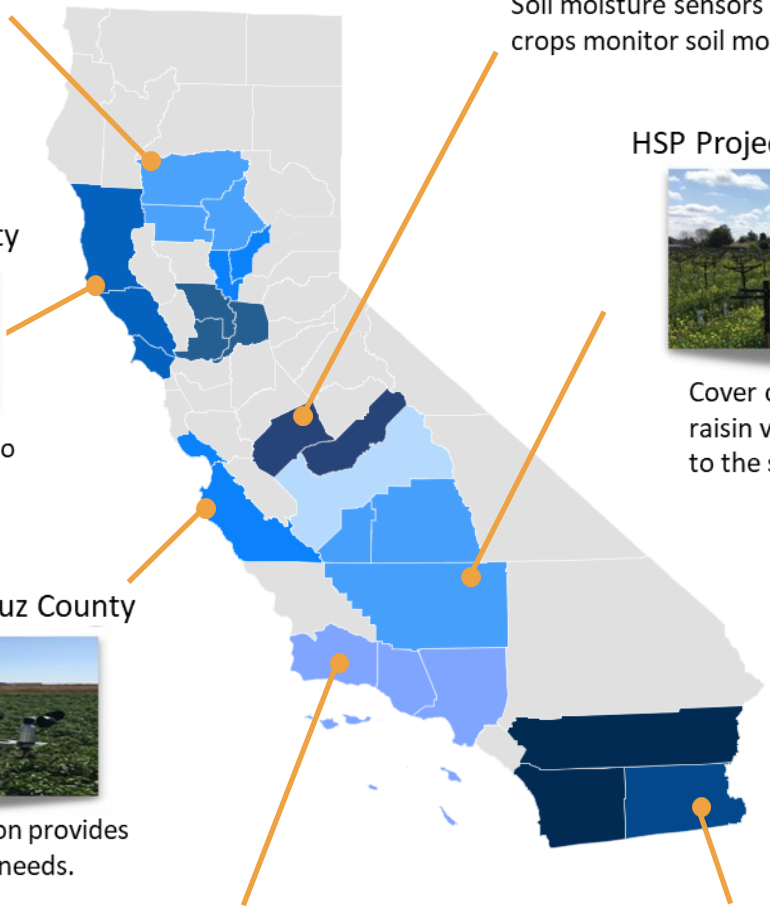
Soil moisture sensors in row crops monitor soil moisture.

HSP Project: Fresno County

Cover crops in an organic raisin vineyard add nitrogen to the soil.

AMMP Project: Sonoma County

A manure solid separator is used to make on-farm compost bedding.



SWEEP Project: Santa Cruz County

An electronic weather station provides real-time data on irrigation needs.

HSP Project: Ventura County

Straw mulch is added to fields of vegetable crops to retain moisture and prevent erosion.

SWEEP Project: Imperial County

Solar panels provide renewable energy for irrigation pumps.