

DREC Highlights: Research and Outreach 2024-2025

This past fiscal year, the Desert Research and Extension Center (DREC) advanced innovation and education through 19 research projects spanning six critical areas: Plant Breeding and Variety Trials, Irrigation and Fertilizer Management, Weed and Disease Management, Food Safety, Livestock, and Occupational Heat Stress. These efforts were powered by collaborations with UC academics, USDA scientists, Canadian researchers, and industry partners, addressing challenges that impact Imperial County's top agricultural and livestock commodities.

A standout achievement was the USDA's release of four new carrot germplasm lines—F7738, Nb2159, Nb3271, and Nbh2306—developed through trials at DREC and partner sites. These improved genetic resources will help breeders enhance carrot quality, disease resistance, and adaptability, strengthening the sustainability and competitiveness of U.S. carrot production.

Beyond research, DREC delivered impactful extension programs for all ages, focusing on nutrition, workforce development, career readiness, and agricultural literacy. Our Farm Smart program reached 9,729 participants through onsite and offsite events and provided 18 paid internships for local college students.


Three new initiatives launched this year:

- **ASPIRE Youth Education:** In partnership with the Imperial County Probation Office, an intern led educational sessions for youth.
- **Harvest Fest:** Our first annual celebration brought the community together to enjoy fresh produce and learn about local agriculture.
- **Field-Based Learning:** Thirteen Imperial Valley College students participated in a four-month immersive experience studying water and nitrogen impacts on melon and zucchini production.

We also secured funding for two major projects: one to equip TK-12 educators with food and nutrition education resources, and another to empower youth through hands-on agricultural learning.

Get Involved!

Want to learn more about our projects, attend upcoming events, or explore partnership opportunities?

 Contact us at 760-791-0521 or email jdiazr@ucanr.edu.

 Visit ucanr.edu/rec/desert-research-and-extension-center for program details and updates.

Plant Breeding and Variety Trials

Project/Goal	Leader
<u>Winter nursery for new cereal varieties.</u> To evaluate genetic lines of barley, wheat, and triticale that have potential for genetics and commercial applications.	Mike Oro, Western Crop Innovations - Canada, 403-391-8617, moro@westerncropinnovations.com
<u>Carrot germplasm.</u> The objectives of the project are to establish a winter carrot nursery and to have commercial carrot varieties from various seed companies planted in side by side comparisons for a carrot field day.	Jaspreet Sidhu, UCCE Kern County, 661-868-6222, jaksidhu@ucdavis.edu
<u>Breeding drought resistance alfalfa for Imperial Valley.</u> To screen and evaluate breeding populations in conventional fields and continue to develop the breeding program pipeline for cultivar delivery.	Charles Brummer, UC Davis – Plant Sciences, 530-574-6133, ecbrummer@ucdavis.edu
<u>Breeding stress-tolerant chickpeas.</u> Screen segregating populations of cultivar x wild introgressions for grain yield under high temperatures and make selections for use in backcross breeding.	Varma Penmetsa, UC Davis – Plant Sciences, 916-502-5474, rvpenmetsa@ucdavis.edu
<u>Broccoli variety trials.</u> Evaluate broccoli cultivars provided by the Known-You Seed America Corporation for their suitability under Imperial County conditions.	Jairo Diaz, UC ANR DREC, 760-791-0521, jdiazr@ucanr.edu

Irrigation and Fertilizer Management

Project/Goal	leader
<u>Olive production practices in the Imperial Valley.</u> The objective of this research is to study the efficiency and the economic feasibility of various olive production practices in the Imperial Valley with emphases on water use efficiency and the possibility of the reuse of surface and subsurface drainage waters to supplement crop water needs.	Khaled Bali, UC ANR Specialist, 559-646-6541, kmbali@ucanr.edu
<u>Assessment of drone imagery and proximity sensing tools on deficit irrigation of melons.</u> Evaluate the response of cantaloupes to different irrigation regimes and assess drone imagery and plant diagnostic tools throughout the growing season.	Jairo Diaz, UC ANR DREC, 760-791-0521, jdiazr@ucanr.edu
<u>Developing Information on the Best Nitrogen and Water Management Practices in Desert Lettuce.</u> Develop knowledge and information on improving and promoting adaptation of management practices that optimize N and irrigation water use efficiency in the California's Low Desert Lettuce Production Systems under drip irrigation.	Aliasghar Montazar, UCCE Imperial County, 442-265-7707, amontazar@ucanr.edu
<u>Nitrogen fertilizer and irrigation best management practices for the low desert sundangrass production systems.</u> Develop improved N and irrigation management strategies for Sudan grass production in the low desert.	Oli Bachie, UCCE Imperial County, 442-265-7700, obachie@ucanr.edu

<u>Determine the efficacy of novel management strategies to improve alfalfa water use efficiency in the low desert.</u> This study aims at conducting research and demonstration of the concepts of partial-season (deficit) irrigation strategies focused on alfalfa as the major water users in the region.	Aliasghar Montazar, UCCE Imperial County, 442-265-7707, amontazar@ucanr.edu
<u>Improved irrigation strategies for alfalfa production in California.</u> Develop and improve irrigation strategies to increase water use efficiency in alfalfa production in California across different soil and climatic conditions.	Khaled Bali, UC ANR Specialist, 559-646-6541, kmbali@ucanr.edu

Weed and Disease Management

Project/Goal	leader
<u>Efficacy or suitability of selected pre-emergent herbicides for Guayule.</u> Evaluate various preemergent herbicides that may be efficient to control / suppress weeds and registered for weed management for guayule production system.	Oli Bachie, UCCE Imperial County, 442-265-7700, obachie@ucanr.edu
<u>Advancing Sustainable Agriculture Through Robotic Weed Management.</u> Develop and demonstrate the capability to sustainably and robotically remove weeds from cropping systems.	Jairo Diaz, UC ANR DREC, 760-791-0521, jdiazr@ucanr.edu
<u>Evaluation of chemical and biological fungicides for managing onion downy mildew in the Imperial Valley.</u> Assess the effectiveness of biological fungicides in managing downy mildew in onions. Test in-registration fungicides to determine their effectiveness and practicality for future use in managing downy mildew.	Ana Pastrana, UCCE Imperial County, 442-238-3950,, ampastranaleon@ucanr.edu
<u>Evaluation of contemporary variation in lettuce downy mildew and the effectiveness of disease resistance genes in the Imperial Valley.</u> Detect new <i>Bremia lactucae</i> pathotypes through a trap nursery, assess resistance genes in advanced breeding lines, and educate growers and PCAs on resistance selection and pathogen evolution.	Ana Pastrana, UCCE Imperial County, 442-238-3950,, ampastranaleon@ucanr.edu
<u>Evaluation of biological control strategies for powdery mildew on cantaloupe melons in the desert growing conditions of the Imperial Valley.</u> The main long-term objective of this project is to provide updated information on the efficacy of organic fungicides for melon powdery mildew management in the Imperial Valley, CA.	Ana Pastrana, UCCE Imperial County, 442-238-3950,, ampastranaleon@ucanr.edu

Food Safety

Project/Goal	leader
<u>Assessment of antibiotic resistance in fresh vegetables from farm to fork.</u> Identify critical factors contributing to antibiotic resistance transmission during vegetable production.	Erin DiCaprio, UC Davis, Food Science and Technology, 530-752-6594, eldicaprio@ucdavis.edu

Livestock

Project/Goal	leader
Cattle nutrition and management. Examine how varying levels of metabolizable protein and the inclusion of essential oils in the diet affect the growth performance and carcass characteristics of calf-fed Holstein and Holstein cross cattle.	Brooke Latack, UC CE Imperial County, 442- 265-7712, bclatack@ucanr.edu

Occupational Heat Stress

Project/Goal	leader
Heat-related illness prevention: Improve WBGT forecast accuracy for farmworkers by validating NDFD predictions and developing a tailored algorithm using CIMIS weather data and direct WBGT measurements.	Farzaneh Khorsandi, UC Davis, Biological and Agricultural Engineering, 530-752-7848, fkhorsandi@ucdavis.edu

Outreach Programs

Project/Goal	Leader
Farm Smart educational programs. The program promotes a better understanding of agriculture, the source of our food, fiber and energy, and its impact on our economy and daily lives, as well as protecting natural resources and cultivating healthy people and communities.	Mariana Gonzalez, UC ANR DREC, 760-356-3067, mgonzalezcastro@ucanr.edu
Student intern programs. Provide internship opportunities for local college students to enhance and encourage interest in careers related to agriculture, natural resources, nutrition, leadership, and STEM fields.	Mariana Gonzalez, UC ANR DREC, 760-356-3067, mgonzalezcastro@ucanr.edu
Food and agriculture summer learning program. Provide professional development and educational activities for Imperial Valley College students in the areas of food, agriculture, natural resources, human sciences, and other related disciplines.	Mariana Gonzalez, UC ANR DREC, 760-356-3067, mgonzalezcastro@ucanr.edu
Field-based learning projects: Hands-on opportunities for Imperial Valley College students to tackle real agricultural challenges through activities like experiment design, variable control, data collection, and sensor use.	Jairo Diaz, UC ANR DREC, 760-791-0521, jdiazr@ucanr.edu
Enhancing pedagogical expertise in food and nutrition education: farm to school initiatives in California's low desert region. Develop a diverse array of programs designed to equip teachers in TK-12 settings with relevant knowledge and practical, hands-on activities.	Yu Meg, UC CE Imperial County, ucmeng@ucanr.edu
Carrot outreach program. Design and deliver school (K-12) and community (adult) outreach programs in carrot nutrition and production.	Jairo Diaz, UC ANR DREC, 760-791-0521, jdiazr@ucanr.edu
Empowering youth through agriculture education. Reach 500 K-12 students from underserved communities throughout Imperial County with hands-on agriculture education, increasing youth appreciation for agriculture, the protection of our natural resources, and the development of healthy eating habits.	Mariana Gonzalez, UC ANR DREC, 760-356-3067, mgonzalezcastro@ucanr.edu