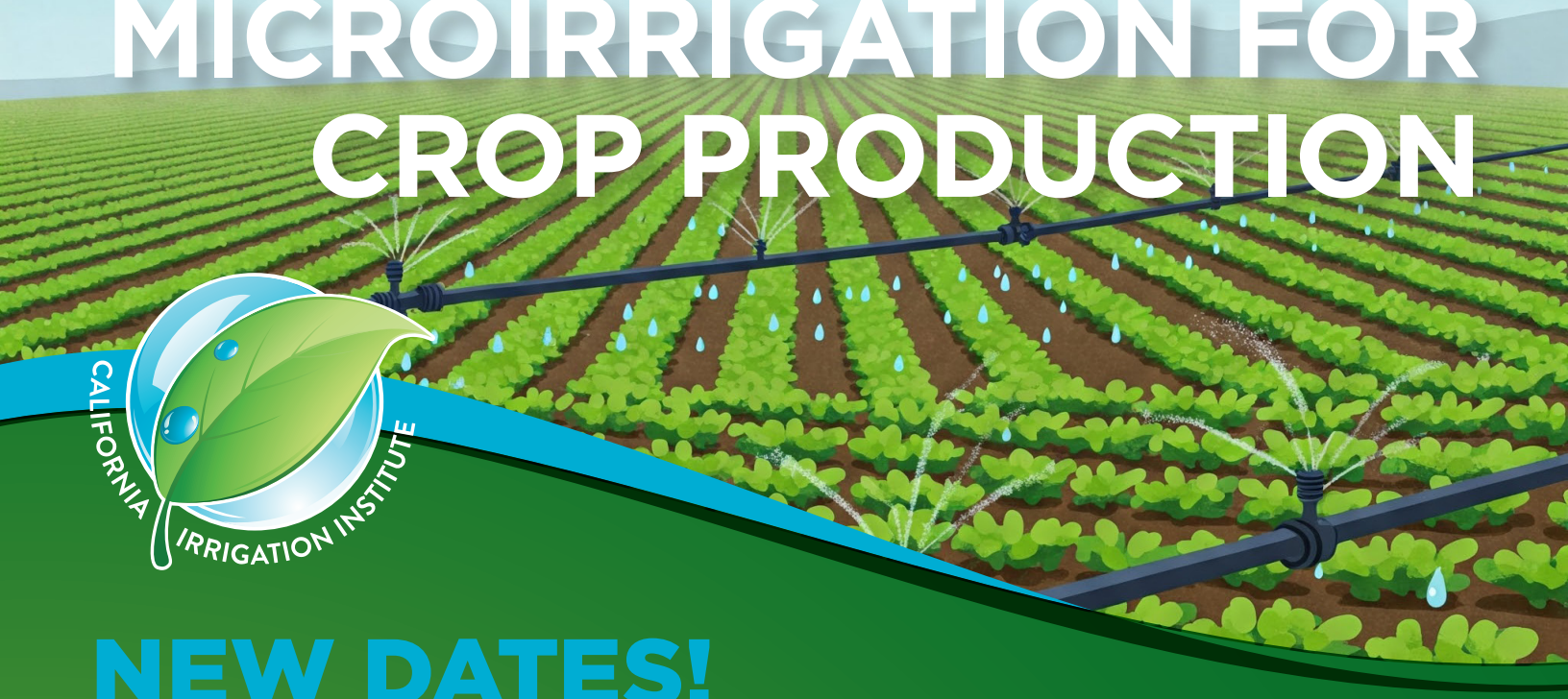
UC DAVIS COLLEGE OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES

COTH2O Consorcio Tecnológico del Agua

UNIVERSITY OF CALIFORNIA Agriculture and Natural Resources

2026 ADVANCED SCHOOL ON MICROIRRIGATION FOR CROP PRODUCTION



CALIFORNIA IRRIGATION INSTITUTE

NEW DATES!

CLASS LECTURES: MARCH 30 - APRIL 1
FIELD TRIPS: APRIL 2 - 3

Class lectures will be held in the UC Davis Conference Center. Field trips will be in the San Joaquin Valley and Central Coast of California.

ATTENDING THIS SCHOOL WILL PROVIDE:

- 3 days of practical class lectures on principles and implementation of microirrigation systems and management practices for crop production
- 2 days of field demonstration visits (one day in the San Joaquin Valley for modernized irrigation delivery systems, and fruit and nut crops; one day in the Central Coast for vineyards, vegetable crops, and berries)

QUESTIONS?
PLEASE CONTACT US:

- **Daniele Zaccaria - UC Davis:** dzaccaria@ucdavis.edu
- **Mary Ann Dickinson:** maryann@dickinsonassociates.com

Instructors of the School are professionals with extensive experience on principles and practical applications of microirrigation for resource-efficient crop production.

WHAT YOU WILL LEARN:

- Technical aspects of water delivery systems to allow for successful adoption and management of microirrigation systems
- Soil-water movement and soil-plant-water relations with microirrigation
- Microirrigation systems design, operation, maintenance, automation, and performance evaluation
- Methods and tools for microirrigation scheduling
- Managing microirrigation for different crops (field and agronomic crops; vegetable crops; berry crops; fruit crops; nut crops; vineyards)
- Chemigation and fertigation
- Salinity management with microirrigation

2026 ADVANCED SCHOOL ON MICROIRRIGATION FOR CROP PRODUCTION

March 30 – April 3, 2026

<u>Day 1 (March 30, 2026)</u> – Topics: General Aspects of Microirrigation

- ✓ Introduction to Microirrigation: Definition; Advantages and Constraints; Types of Microirrigation Systems; Microirrigation Use Worldwide; Enabling Conditions for Successful Adoption of Microirrigation (J. Ayars)
- ✓ Hydrological and Basin-scale Considerations for Microirrigation (P. Steduto)
- ✓ Water Delivery Requirements for Successful Adoption of Microirrigation (E. Rothberg)
- ✓ Economic and Financial Considerations for Adapting Water Delivery Systems and Services to Microirrigation (FAO-CFI)
- ✓ Microirrigation Systems' Components and Functions (T. Devol)
- ✓ Water Movement from the Soil and through the Plant (P. Steduto)
- ✓ Measuring and Regulating Plant-Water Status (K. Shackel)
- ✓ Water Movement and Storage in Various Soil Types under Microirrigation (B. Sanden)
- ✓ Methods and Tools for Microirrigation Scheduling in Specialty Crops (D. Zaccaria; M. Cahn)
- ✓ Using Microirrigation for Frost Protection and Evaporative Cooling (R. Snyder)
- ✓ Energy Demand and Supply Dynamics with Microirrigation (A. Aghajanzadeh)

08:00 – 08:30 am: Coffee and Refreshments

08:30 – 08:45 am: Welcome to the Advanced Microirrigation School for Crop Production

Session 1 – General Introduction and Hydrologic/Basin-scale Considerations. *Coord's: J. Ayars; P. Steduto*

08:45 – 09:00 am: Introduction to Microirrigation (J. Ayars)

09:00 – 09:20 am: Does Microirrigation Save Water on a Basin Scale? (P. Steduto)

09:20 – 09:50 am: Adapting Different Water Delivery Systems and Services to Microirrigation (E. Rothberg)

09:50 – 10:30 am: Economic and Financial Considerations for Adapting Water Delivery Systems and Services to Microirrigation (G. Munoz)

10:30 – 10:50 am: Questions & Answers

10:50 – 11:15 am COFFEE BREAK

Session 2 – The Soil-Plant-Microirrigation Continuum: Water Application, Uptake, and Regulation. *Coord's: P. Steduto; K. Shackel*

11:15 – 11:40 am: Microirrigation Systems' Components and Functions (T. Devol)

11:40 – 12:00 pm: Water Movement and Storage in Various Soil Types under Microirrigation (B. Sanden)

12:00 – 12:20 pm: Water Movement from the Soil through the Plant (P. Steduto)

12:20 – 12:45 pm: Measuring and Regulating Plant-Water Status (K. Shackel)

12:45 – 1:00 pm: Questions & Answers

1:00 – 2:00 pm LUNCH

Session 3 – Scheduling Water Applications, Microclimate Management, and Energy Dynamics in Microirrigation Systems. *Coord's: D. Zaccaria; M. Cahn*

2:00 – 2:30 pm: Methods and Tools for Microirrigation Scheduling in Specialty Crops (D. Zaccaria)

2:30 – 3:00 pm: Using Microirrigation for Frost Protection and Evaporative Cooling (R. Snyder)

3:00 – 3:30 pm: Energy Demand and Supply Dynamics with Microirrigation (A. Aghajanzadeh)

3:30 – 3:45 pm: Questions & Answers

3:45 – 4:00 pm COFFEE BREAK

4:15 - 5:30 pm Outdoor Field Session: Measuring Soil and Plant Water Status (M. Cahn; K. Shackel; C. Albuquerque)

6:00 – 8:00 pm – Social Dinner with Sponsors and Exhibitors at the UC Alumni Center

6:30 – 7:30 pm – Tributes to Irrigation Research Leaders (George H. Hargreaves; Jack Keller; Freddy R. Lamm; Claude J. Phene)

<u>Day 2 (March 31, 2026)</u> - Topics: Microirrigation System Design and Operation

- ✓ Design Principles for Resource-Efficient Microirrigation Systems (D. Zaccaria)
- ✓ Hydraulics for Microirrigation Systems (O. Lagos)
- ✓ Design Considerations for Sub-surface Drip Irrigation (J. Ayars)
- ✓ Filtration and Fertigation Systems (K. Bali; Z. Wang)
- ✓ Design and Operational Considerations for Pumps, Valves, and Flow Measurement (T. Devol)
- ✓ Microirrigation Systems Operation, Monitoring, and Maintenance (M. Cahn)
- ✓ Performance Evaluation of Microirrigation Systems and Financial Considerations (J. Anshutz)
- ✓ Microirrigation System Automation and Monitoring (A. Rehnvall; B. Sanden; J. Nichols)

08:30 – 09:00 am: Coffee and Refreshments

Session 5 – Design Criteria and Hydraulics for Microirrigation Systems. *Coord's: O. Lagos; D. Zaccaria*

09:00 – 09:30 am: Design Criteria and Procedure for Resource-Efficient Microirrigation (D. Zaccaria)

09:30 – 10:00 am: Hydraulics for Microirrigation Systems (O. Lagos)

10:00 – 10:30 am: Subsurface Drip Irrigation System Design Considerations (J. Ayars)

10:30 – 10:45 am: Questions and Answers

10:45 – 11:00 am COFFEE BREAK

Session 6 – Filtration and Fertigation Systems, Pumps, Valves, and Flow/Pressure Control Devices. *Coord's: K. Bali; Z. Wang*

11:00 – 11:25 am: Filtration Systems, Operation, and Monitoring (K. Bali)

11:25 – 11:50 pm: Chemical Injection Systems, Operation, and Monitoring (Z. Wang)

11:50 – 12:15 pm: Design and Operational Considerations for Pumps, Valves, and Flow Measurement (T. Devol)

12:15 – 12:30 pm: Questions and Answers

12:30 – 1:30 pm LUNCH

Session 7 – Operation, Monitoring, Maintenance, and Field Evaluation of Microirrigation Systems. *Coord's: M. Cahn; J. Anshutz*

1:45 – 2:45 pm: Field session on Microirrigation System Evaluation

- Monitoring Microirrigation Systems and Troubleshooting (M. Cahn)
- Evaluating Field Performance of Microirrigation Systems (J. Anshutz)

3:00 – 3:30 pm: A Novel Tool for Evaluating Microirrigation Performance and Financial Considerations (J. Anshutz)

3:30 – 3:45 pm COFFEE BREAK

Session 8 – Microirrigation System Automation and Monitoring. *Coord's: B. Sanden; J. Nichols*

3:45 – 4:15 pm: Principles of Irrigation Automation (A. Rehnvall)

4:15 – 4:45 pm: Automation and System Monitoring Components (B. Sanden)

4:45 – 5:15 pm: Success Stories in Implementing Microirrigation Automation (J. Nichols)

5:15 – 5:30 pm: Questions & Answers

5:30 pm ADJOURN

5:45 – 7:45 pm – Social Hours and Refreshments with Sponsors and Exhibitors at UC Davis Conference Center

<u>Day 3 (April 1, 2026)</u> - Topics: Microirrigation Management for Various Crops

- ✓ Management of Microirrigation for: Nut Crops; Fruit Crops; Subtropical Crops; Grape Vineyards; Field and Agronomic Crops; Vegetable Crops; Berry Crops (A. Fulton; T. DeJong; B. Faber; M. Fidelibus; K. Bali; M. Cahn; A. Biscaro)
- ✓ Nutrient Management Strategies with Microirrigation Systems (D. Amaral)
- ✓ Applying Agrochemicals through Microirrigation Systems (Z. Wang)
- ✓ Irrigating with Biological Effluents and Recycled Water with Microirrigation Systems (G. Vivaldi)
- ✓ Irrigation Water Quality Considerations with Microirrigation (G. Vivaldi)
- ✓ Salinity Management with Microirrigation (E. Scudiero; J. Ayars)

07:30 – 08:00 am: Coffee and Refreshments

Session 9 – Microirrigation Management Strategies for Perennial Crops. *Coord's: M. Cahn; D. Zaccaria*

08:00 – 08:30 am Nut Crops – Almond and Walnut (A. Fulton)
08:30 – 09:00 am Nut Crops – Pistachio (B. Sanden)
09:00 – 09:30 am: Fruit Crops (T. DeJong)
09:30 – 10:00 am: Subtropical Crops – Citrus and Avocado (B. Faber)
10:00 – 10:30 am: Grape Vineyards (M. Fidelibus)
10:30 – 10:45 am: Questions & Answers

10:45 – 11.00 am COFFEE BREAK

Session 10 – Microirrigation Management Strategies for Annual and Berry Crops. *Coord's: K. Bali; A. Biscaro*

11:00 – 11:30 am Field and Agronomic Crops (K. Bali)
11:30 – 12:00 pm: Vegetable Crops (M. Cahn)
12:00 – 12:30 pm: Berry Crops (A. Biscaro)
12:30 – 12:45 pm: Questions & Answers

12:45 – 1:45 pm LUNCH

Session 11 – Application of Chemicals and Biological Effluents. *Coord's: M. Cahn; O. Lagos*

2:00 – 2:30 pm: Nutrient Management Strategies with Microirrigation Systems (D. Amaral)
2:30 – 3:00 pm: Applying Agrochemicals through Microirrigation Systems (Z. Wang)
3:00 – 3:30 pm: Irrigating with Biological Effluents and Recycled Water with Microirrigation Systems (G. Vivaldi)
3:30 – 3:45 pm: Questions & Answers

3:45 – 4:00 pm COFFEE BREAK

Session 12 – Salinity Management with Microirrigation. *Coordinators: J. Ayars; K. Bali*

4:00 – 4:30 pm: Irrigation Water Quality Considerations with Microirrigation (G. Vivaldi)
4:30 – 5:00 pm: Quantifying and Mapping Soil Salinity and Sodicity (E. Scudiero)
5:00 – 5:30 pm: Leaching and Salinity Management Practices (J. Ayars)
5:30 – 5:45 pm: Questions & Answers

6:00 – 6:30 pm: School Lectures Closing and Delivery of Completion Certificates (J. Ayars; O. Lagos; D. Zaccaria; K. Bali; M. Cahn)

6:30 pm: ADJOURN

<u>Day 4 (April 2, 2026)</u>: Field/Demonstration Visits in the San Joaquin Valley (Modernized Irrigation Water Delivery Systems; Irrigation/Fertigation Automation; Nut Crops; Fruit Crops). *Coordinators: D. Zaccaria; C.M. Culumber; K. Bali*

7:00 am: **Departure from Davis and drive to Turlock, CA**

Visit 1 – Modernized Irrigation Water Delivery Systems: Turlock Irrigation District (TID) – Turlock, CA

09:00 – 11:00 am: Turlock Irrigation District Headquarter (TID Personnel; E. Rothberg)

11:00 – 11:30 am: Early Lunch at Turlock Irrigation District Headquarter (lunch will be catered at TID)

11:45 – 12:30 pm: Laterals 7 and 8; Ceres Regulating Reservoir, Automated Gates and Irrigation Delivery Offtakes + Q&A (TID Personnel; E. Rothberg)

12:30 – 2:30 pm: Drive to Hanford, CA

Visit 2 – HotSpot Ag: Hanford, CA

2:30 – 3:00 pm: Rationale and Metrics for Performance Evaluation of Microirrigation Systems (J. Anshutz)

3:00 – 3:30 pm: Automation of Microirrigation and Fertigation for Fruit and Nut Crops and Vineyards + Q&A (J. Nichols)

Visit 3 – Nichols Farms: Hanford, CA

3:45 – 4:45 pm: Irrigation, Nutrient, and Salinity Management in Pistachio and Almond Production Orchards + Q&A (D. Amaral; C.M. Culumber; J. Nichols; D. Zaccaria)

4:45 pm ADJOURN

6:30 pm: Dinner and overnight stay in Visalia, CA at participants' expense

<u>Day 5 (April 3, 2026)</u>: Field/Demonstration Visits in Salinas/Monterey Areas (Vineyards, Vegetable and Berry Crops). *Coordinators: M. Cahn; L. Bettiga; C. Albuquerque*

7:00 am: Departure from hotel in Visalia, CA and drive to Soledad, CA

Visit 1 – Zabala Vineyards (Soledad, CA)

9:30 – 11:30 am CIMIS Weather Station; Measurement of Grapevine Water Status; Irrigation Scheduling with Drip Systems in Vineyards; Validation of Satellite Remote Sensing-based ET versus ground-based ET for Vineyards; Q&A (M. Cahn; L. Bettiga; C. Albuquerque)

11:45 – 1:00 pm **LUNCH (lunch meals will be catered at a lunch meeting place)**

Visit 2 – Cool-season Vegetable Production Farm (Soledad, CA)

1:30 – 3:00 pm: Drip Irrigation System Design and Management; Irrigation and Nutrient Management Practices for Cool-season Vegetables; Q&A (M. Cahn)

Visit 3 – Berry Crops Production Farm (Salinas, CA)

3:30 – 4:30 pm: Irrigation System Design; Irrigation and Nutrient Management Practices for Strawberry; Q&A (M. Cahn)

4:45 pm ADJOURN

5:00 – 8:00 pm: **Vans drive back to Davis, CA.**

List of Instructors, Titles, and Affiliations

1) James Ayars: Research Agricultural Engineer (retired) - USDA-Agriculture Research Service, Fresno, CA
2) Pasquale Steduto: Senior Water Scientist, LAWR Department - University of California, Davis
3) Eric Rothberg: Sales Manager North America - Rubicon Water, Fort Collins, CO
4) Giovanni Munoz: Chief East and Southern Africa Service - FAO-UN Center for Investment
5) Tom Devol: Professional Irrigation Designer – Chico, CA
6) Blake Sanden: Agronomy and Irrigation Advisor (Emeritus) - University of California Cooperative Extension Kern County
7) Kenneth Shackel: Professor, Department of Plant Sciences - University of California, Davis
8) Daniele Zaccaria: Professor & Agricultural Water Management Specialist, LAWR Department - University of California, Davis
9) Richard Snyder: Bio-meteorology Specialist (Emeritus), LAWR Department - University of California, Davis
10) Arian Aghajanzadeh: Founder of Klimate Consulting, LLC – San Francisco, CA.
11) Michael Cahn: Irrigation and Water Resource Advisor – University of California Cooperative Extension Monterey County
12) Caetano Albuquerque: Professor, Department of Biology and Chemistry – California State University Monterey Bay
13) Octavio Lagos: Professor, School of Agricultural Engineering - University of Concepcion, Campus of Chillan (Chile)
14) Khaled Bali: Irrigation Water Management Specialist – University of California Agriculture and Natural Resources
15) Zheng Wang: Vegetable Crop Advisor - University of California Cooperative Extension Stanislaus County
16) James Anshutz: Founder AGH2O – Fresno, CA
17) Anders Rehnvall: CEO at EZE System Inc. - Folsom, CA
18) James Nichols: President – HotSpot Ag, Hanford, CA
19) Allan Fulton: Irrigation and Water Resource Advisor (Emeritus) – University of California Cooperative Extension Tehama, Glenn, Colusa, and Shasta Counties
20) Theodore DeJong: Distinguished Professor & Pomologist Emeritus, Department of Plant Sciences- University of California, Davis
21) Ben Faber: Subtropical Crop Advisor - University of California Cooperative Extension Ventura County
22) Matthew Fidelibus: Professor of Viticulture and Enology for Cooperative Extension, Department of Viticulture and Enology - University of California, Davis
23) Andre Biscaro: Irrigation Advisor – University of California Cooperative Extension Ventura County
24) Doug Amaral: Professor & Extension Specialist, Department of Crop & Soil Sciences, University of Georgia
25) Gaetano Alessandro Vivaldi: Professor - Universita' degli Studi Aldo Moro, Bari (Italy)
26) Elia Scudiero: Associate Professor, Department of Environmental Sciences – University of California, Riverside
27) Catherine Mae Culumber: Nut Crop Advisor – University of California Cooperative Extension Fresno County

Email contacts of Instructors

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