

SGMA-Ready Crops for the San Joaquin Valley

July 28, 2026

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with research support from Spencer Cole



Supported with funding from the S. D. Bechtel, Jr. Foundation
and the USDA Agriculture and Food Research Initiative



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The San Joaquin Valley has been a major focus for 8+ years

REPORT - MARCH 2017

Water Stress and a Changing San Joaquin Valley

Ellen Hanak, Jay Lund, Richard Howitt, Peter Moyle, Brian Gray, Josué Medellín-Azuara, Sarge Green, Thomas Harter, N



REPORT - FEBRUARY 2019

Water and the Future of the San Joaquin Valley

Ellen Hanak, Alvar Escriva-Bou, Brian Gray, Sarge Green, Thomas Harter, Jelena Jezdimirovic, Jay Lund, Josué Medellín-Azu



REPORT - SEPTEMBER 2023

Managing Water and Farmland Transitions in the San Joaquin Valley

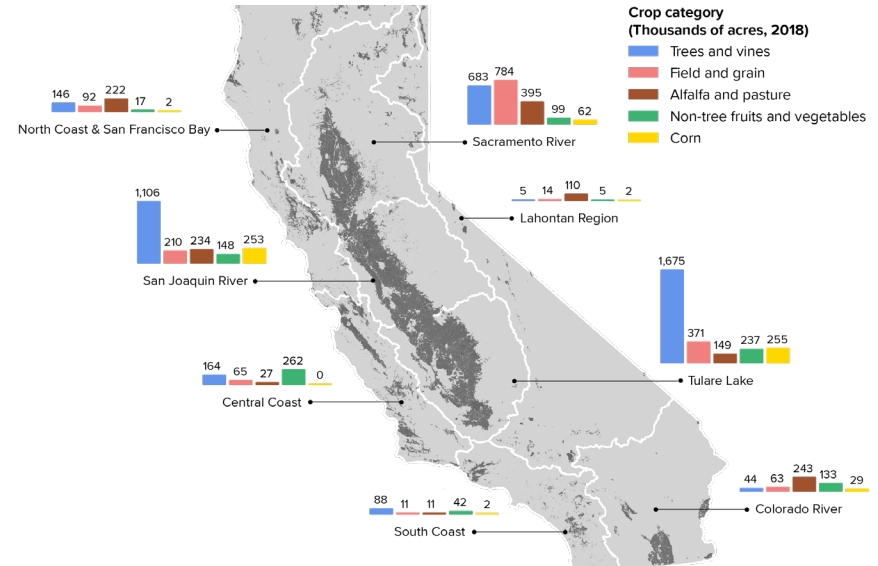
Ellen Hanak, Andrew Ayres, Caitlin Peterson, Alvar Escriva-Bou, Spencer Cole, and Zaira Joaquín Morales, with research support from Shayan Kaveh, Amy Mahler, and Annabelle Rosser

REPORT PDF



California's agriculture is the highest value in the country, led by the San Joaquin Valley

- California farms produce over 400 commodities on 25 million acres (9 million irrigated) worth \$50–60 billion a year
- The San Joaquin Valley accounts for about 2/3 of that value and over half of irrigated acreage
- Agriculture directly employs 420,000 people statewide



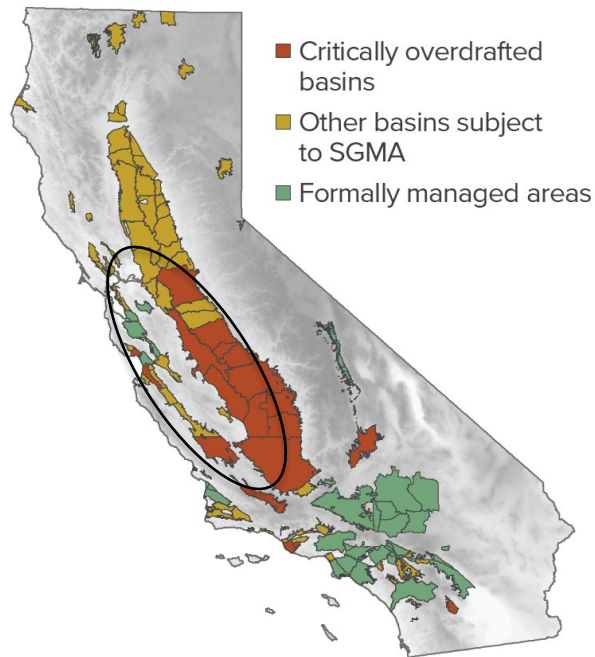
The San Joaquin Valley is a fast-growing region whose economy depends on agriculture

- The valley is home to roughly 1 in 9 Californians, about half of whom are Latino
- For decades, the valley's population has grown faster than the state's and is projected to keep outpacing statewide growth
- Farming and related industries drive the valley's economy—14 percent of GDP and 17% of employment, about 340,000 jobs



The San Joaquin Valley is ground zero for SGMA

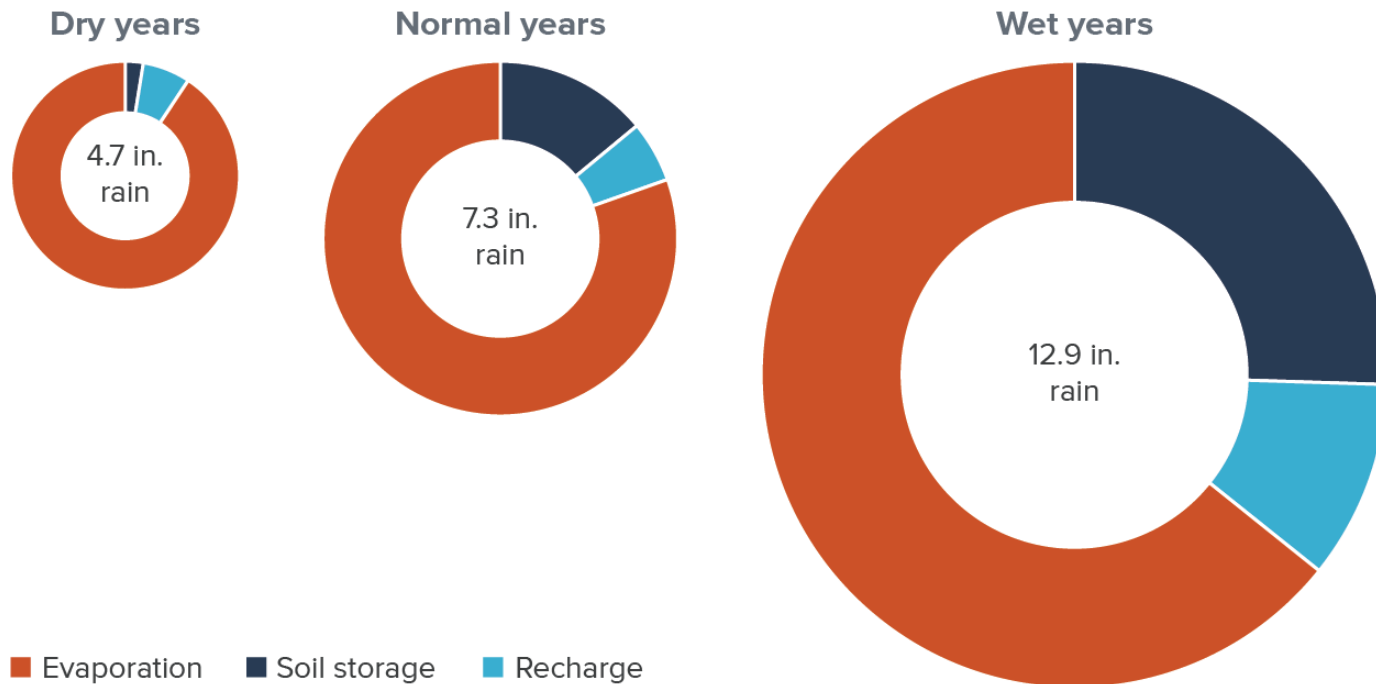
Main groundwater basins



Source: Groundwater in CA (PPIC 2024).

- The Sustainable Groundwater Management Act (SGMA) regulates groundwater pumping in overdrafted basins
- Overdrafted basins must reach sustainability targets by the early 2040s
- Most of the valley's basins are critically overdrafted
- The valley may see 500,000–900,000 acres fallowed by 2040—up to 20% of irrigated acreage

Fallow fields lose more than half of water inputs to evaporation, even in the wettest years



SGMA-ready crops can help keep land in agriculture

- Land with limited access to water could support more water-efficient crops
- SGMA-ready crops must:
 - Generate revenue
 - Avoid the worst downsides of fallowing
 - Keep groundwater goals on track
- Examples include:
 - Desert-adapted crops (agave, jojoba)
 - Cover crops
 - Winter forages (small grains, cereals)



Photo: DWR

Our research focuses on how much water these crops use compared to fallow

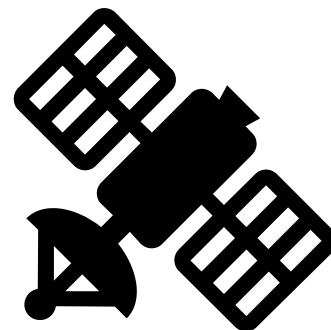
1. Direct measurement

- field trials
- ground-based instruments
- soil samples

2. Remote sensing

- Evapotranspiration and land use

3. Crop and soil modeling



Photos: UC ANR and Mark Lundy

Small grains forage provide high returns per drop of water

These crops can pay off by shifting the growing calendar earlier:

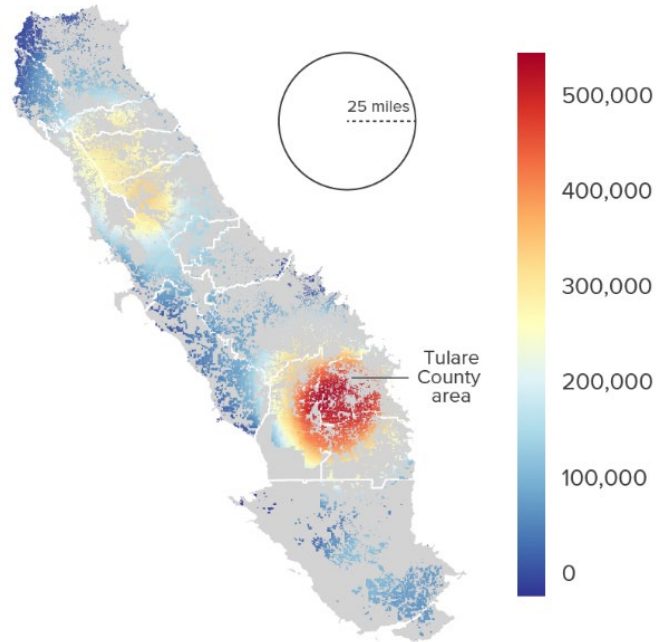
1. Plant in mid-October, about 6 weeks early
2. Irrigate after planting, and not much
 - 4 to 8 inches is often enough to establish the crop
3. Harvest in March, about 2 months early
 - Forage uses less water (rain + irrigation) than a grain harvest

Properly managed, small grain forage can provide multiple benefits

- Uses little more water than fallow
- Is compatible with groundwater recharge
- Reduces problems associated with fallowing
 - Controls dust emissions
 - Limits weeds and pests
- Provides revenue, but financial viability depends on several factors

Dairies create opportunities for small grain forages

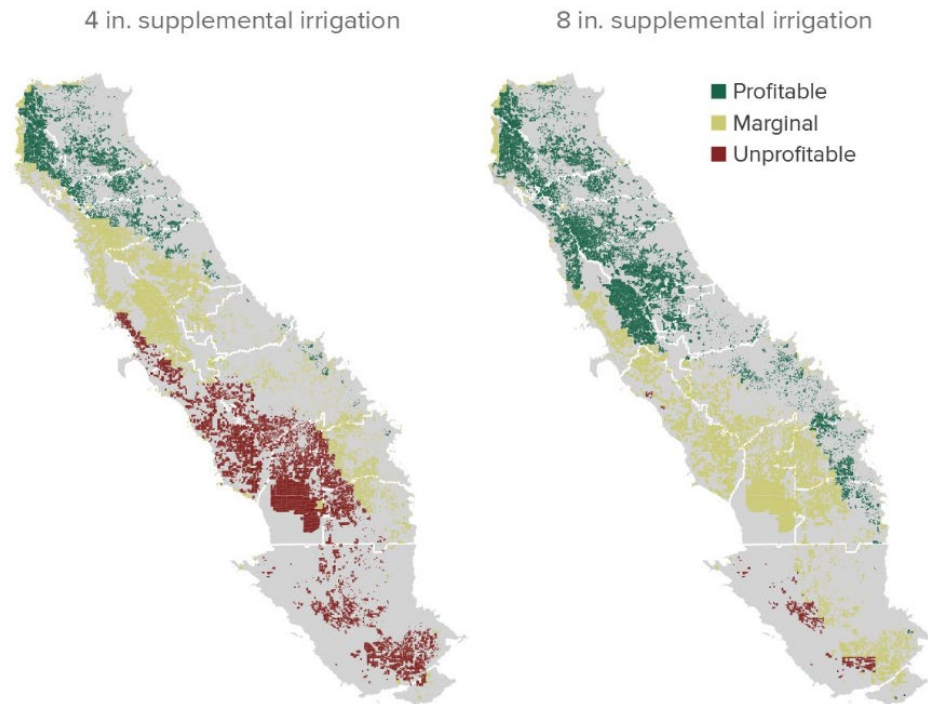
Dairy cow population density
within 25 miles of annual cropland



- Forage crops need to be grown near a source of demand
- Dairy cows are biggest potential market for these crops

Profitability is driven by yields, rainfall, and water year type

- More irrigation markedly improves profitability
- North valley areas close to dairies are particularly suitable
- The greatest demand is in Tulare, Kings County, but water availability may limit opportunities

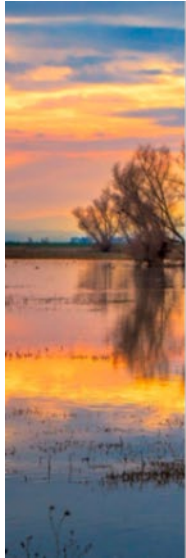


Small policy changes can help growers avoid following

- GSA accounting methods and fallow water use tracking
- Crop insurance supports for dryland/low-water winter crops and flex crops
- Integration with state incentive programs, including land repurposing or allocation retirement programs



Thank you!



Notes on the use of these slides

These slides were created to accompany a presentation. They do not include full documentation of sources, data samples, methods, and interpretations. To avoid misinterpretations, please contact:

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Thank you for your interest in this work.