



Feed Crop Irrigation & Nutrient Efficiency for California Dairies

WHO

Project Lead: Sustainable Conservation

Partners: Netafim USA, USDA Natural Resource Conservation Service, De Jager Dairy North, Mike McRee Dairy, Western United Dairymen, University of California Cooperative Extension, General Mills Foundation, Nestle USA, Bonneville Environmental Foundation.

WHAT

Sustainable Conservation and its partners have developed and demonstrated an innovative drip irrigation system that reduces water use, nutrient use, and GHG emissions while growing quality feed crops for dairy cows. Manure (nutrients) is collected from the cow barn into a lagoon, and from there is mixed with water and then applied via buried drip irrigation to the feed crops. This water-efficient technology targets water and manure directly to crop root zones in monitored quantities to better meet crop demand. A successful pilot ran from 2014-2016, and the system was demonstrated on dairies across the San Joaquin Valley from 2017-2019 through a USDA Natural Resource Conservation Service Conservation Innovation Grant. The partners are now scaling adoption through outreach, guidance, and incentives – such as cost-share funding from NRCS' Environmental Quality Incentive Program (EQIP).

WHY

About 85% of California's 1.7 million cows are in the San Joaquin Valley, where current manure management on farms contributes to declining groundwater quality. Water availability in the region is also increasingly volatile. In response, the project was started to develop, prove, and scale a solution that enables dairy producers to use their manure nutrients with drip irrigation instead of flood irrigation. In doing so, dairies can ensure crop yield and quality while reducing use of water, risk of nitrate leaching, and nitrous oxide emissions. The technology makes business sense for many California dairies and results in multiple environmental benefits.

WHERE



San Joaquin Valley, California

The majority of California's agricultural production, including dairy farms, is concentrated in the San Joaquin Valley.



This project is one of ten in the California Water Action Collaborative project portfolio.

For more about this project visit: <https://suscon.org/project/managing-dairy-manure/>

CHALLENGES

- **Social:** This project modifies operational and cultural norms on a dairy farm; farmers can be wary of adopting new practices until they are proven and have been accepted by a substantial group of first movers.
- **Financial:** Dairies are struggling financially with limited capital available to make large on-farm investments, and there are many needed investments to choose from each year.
- **Policy:** There are currently few incentives available for innovation and improvement in nutrient management.
- **Communication:** It takes a lot of time to build relationships and communicate with farmers, dairymen, and other stakeholders to gain buy-in for new solutions. This can be compound by the “social” challenge mentioned above.

SUCCESSSES

- Since development in 2014, the technology has operated successfully on multiple dairies with distinct characteristics.
- Pilot results: +14% crop yield, -48% water application, -70% irrigation-related GHG emissions. Recent (median): +2% crop yield, -36% water application, -45% nitrogen application.
- As a result of the project, the system is now eligible for NRCS' EQIP cost share program. NRCS California is currently providing up to about 80% EQIP cost share.

KEY INSIGHTS

- Dairies are complex systems with multiple benefits and tradeoffs possible. Solutions are more effective when they address multiple needs versus one issue.
- Market and government incentives send signals to dairies on where to prioritize their efforts. If customers, brands, regulators, and policy-makers were incentivizing improved nutrient management, such as adoption of this technology, it would better motivate solving the problem.
- Increased early support of innovations that enhance the sustainability of dairy and reduce local impacts to communities is needed, especially from companies with dairy in their supply chain who have the most to benefit.

SCALING & REPLICATING

Sustainable Conservation and its partners are currently scaling adoption of this system in California and in other regions facing similar issues. Farmer support and incentives, such as the USDA Natural Resource Conservation Service's Environmental Quality Incentive Program (EQIP), are critical for scaling.

TAGS

Stewardship Strategies

Water Management
in Direct Operations

Value Chain
Engagement

Collaboration at
Watershed Scale

Nexus Approaches

SDG 6 Targets

