

ORCHARD UPDATE: WATER-WISE: DOING MORE WITH LESS



CHRISTINE GEMPERLE, GEMPERLE ORCHARDS



Everybody has a happy place, and for Christine Gemperle, that place is deep in the heart of her almond orchards. "It's so peaceful entering the orchard while it's nice and cool," she reflects. "You have your headphones on and you're listening to music and the dogs are following you. It's actually very bucolic."

Gemperle and her brother Erich farm 135 acres of orchards as the sole managers and operators of Gemperle Orchards. The fact that she finds her happy place so readily despite the economic and environmental pressures that she and other almond growers face testifies to her belief that the hard work and sustainable growing practices she's adopting will kick those pressures into reverse.

"I'm optimistic because I have to be," Gemperle declares. "But also, I'm bound and determined to make growing almonds sustainably work."

WATER WORKS

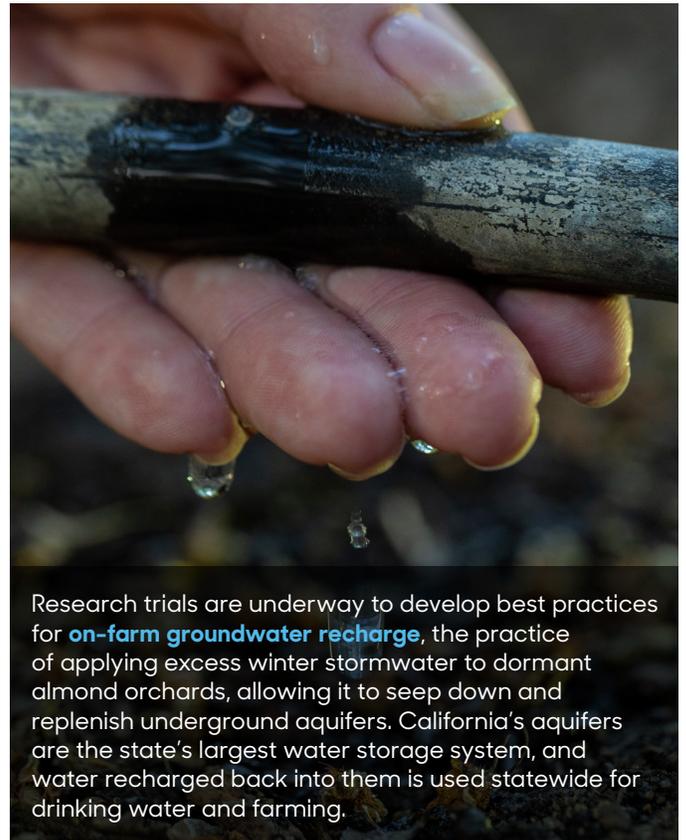
That gives Gemperle a unique perspective on how almond agriculture is changing along with the climate.

"It's definitely changed," she affirms. "Sometimes we have to wait until December to get our first rains, whereas when I was a kid it usually started in October or November. And we used to have the valley fog, which helped put our trees into the dormant cycle that they need. Now we're not seeing that as much because we don't have the moisture."

And despite describing California as having an elaborate water-delivery system, it's no secret that it was built for a different climate than what we face now. No longer can California rely on a winter's-worth of Sierra Nevada snow to fill reservoirs as it melts.

"Now we're seeing these big rain events come through and drop a lot of water that our system isn't set up to collect," Gemperle observes. Case in point: When unusually high rains several seasons back brought as much rain in one day as her water district needed for a whole year, much of it flowed directly to the Pacific Ocean rather than being captured for future use.

"And two years later? I'm in a place where I have zero water allotment again," she says. "What if we'd have been able to save it? What if we'd have gotten some of that excess water out to our fields to flood and **recharge the groundwater?**"



Research trials are underway to develop best practices for **on-farm groundwater recharge**, the practice of applying excess winter stormwater to dormant almond orchards, allowing it to seep down and replenish underground aquifers. California's aquifers are the state's largest water storage system, and water recharged back into them is used statewide for drinking water and farming.

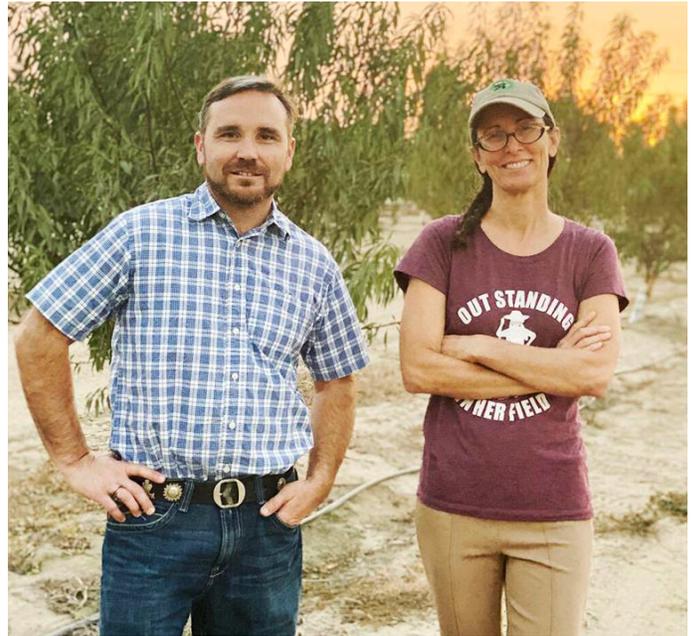
DYNAMIC DUO

If anyone knows how to make sustainable almond farming work, Gemperle does. Having grown up in a poultry- and almond-farming family in California's Central Valley, she's spent much of her life watching farmers steward the resources around them.

After studying biology at the University of California, Santa Cruz, and earning a master's degree in fisheries biology from Utah State University, she returned to the farm to keep that family legacy going.

The two-person operation that she and her brother run sounds intensive and demanding—which it is—but Gemperle insists that despite its attendant responsibilities, the setup has its advantages.

"If you own a farm, I think you should be part of the workforce," she opines. "I would rather do 10 extra hours of hard work a week than five extra hours of paperwork any day. Doing things this way means Erich and I know every aspect of this operation inside and out."



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EVERY DROP COUNTS

An evolved water-management policy and infrastructure might one day make that possible, but until then Gemperle Orchards monitors "every drop we use," Gemperle insists, "and we make sure that it's all focused on the growth of the nut and health of the tree—but not in excess beyond that."

In Gemperle Orchards' case, farming with less water means intensive soil-moisture monitoring, strategic-deficit irrigation and the use of technologies that create efficient irrigation schedules tailored to the operation's water supply, evapotranspiration rates and even weather forecasts— "because the schedule will change as you go through the irrigation season," Gemperle explains. She praises the technology as "very smart and very tied to the biology of the tree," adding that it "goes deep into our understanding of the relationship between the soil, the tree, the climate and water availability."

"Our work completely revolves around the climate and the weather, the availability of water, when it rains and how much it rains," Gemperle says.

Though these factors are keeping farmers on their toes, right now, Gemperle feels good about the systems and best water management practices she and her brother Erich have established within their orchards. Almond farming has progressed greatly since Gemperle was a child, and she's hopeful that the industry's continuous improvements are paving the way for future generations.