

Almond growers seek greater access to greenhouse gas markets

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Building on 10 years of Almond Board of California research on improving nitrogen management and reducing greenhouse gas emissions, the industry is trying to get greater access to the state's cap-and-trade market. The board is working with the Environmental Defense Fund and other partners on a new USDA-funded, \$960,000 pilot project that also would include corn growers.

This will be the first large-scale pilot project generating greenhouse gas credits from nutrient management practices in growing almonds and corn, according to a news release from the Almond Board. The goal is for growers to enter the cap-and-trade market and sell carbon credits to companies and industries seeking to meet their emission targets.

A big challenge, said Gabriele Ludwig, director of sustainability and environmental affairs at the Almond Board, is developing a protocol that will be approved by the California Air Resources Board.

In June, rice growers won air board approval of the first carbon offset protocol for crop-based agriculture in a cap-and-trade market. "The California rice industry really figured out a little earlier than we did in the almond world that we needed to reduce emissions," Ludwig said.

Agriculture is not a nice, tidy system that can easily be monitored like a factory smokestack, she said. That adds to the struggle by regulators already dealing with a lot of people in California who hate the buying and selling of cap-and-trade credits and carbon offsets, Ludwig said. "The board is under pressure to make sure reductions are real," she said.

The \$960,000 project is part of a \$20.5 million allocation from the USDA Conservation Innovation Grant Program to help farmers and ranchers implement practices that will make their operations more resilient to climate change.

According to the Air Resources Board, an offset is a credit for a verified emission reduction from a source outside the cap-and-trade program. "The carbon offset market is for industries not directly regulated by cap and trade," Ludwig said. "If they do voluntary reductions, and can prove it and so forth, then certain amount of cap-and-trade credits can be bought in the offset market. ...

"From the get-go, the air board said this would be a boon for agriculture because it can make money in offset. The reality has been a little different."

Ten years ago, the Almond Board began to fund research to improve nitrogen management and better understand greenhouse gas emissions, particularly nitrous oxide. "There was no data on a good chunk of California's ag systems," Ludwig said. "What are the emissions? What are the factors that drive them?"

In almond production, the emissions are largely carbon dioxide, from fossil fuels, and nitrous oxide, which is emitted when growers add nitrogen to the soil through the use of synthetic fertilizers. "So when looking at the range of areas where agriculture can contribute to reducing greenhouse gases," Ludwig said, "it's reducing emissions and also the carbon sequestration side of it. Research shows that simply growing trees is a way of sequestering carbon."

The project dovetails with Almond Board-funded research to better understand energy flows and the associated greenhouse gases over the average of 25 years of an almond orchard's life.

But a lot of almond acreage has been converted from rangeland, and "fundamentally, natural ecosystems don't release greenhouse gases," Ludwig said. "Agronomic systems release more because we're putting energy into the

system. We use fossil fuels to run the equipment ... and anytime you use fertilizer, you're pretty much using fossil fuels. So by reducing nitrogen use and using nitrogen more efficiently, you're being more effective."

The protocol the board is working on seeks credit for "tweaking, not radically changing," nitrogen use, Ludwig said. Over its years of research, she said, the almond industry found it was doing a good job managing nitrogen but could do better. For example, growers were testing July leaf samples to see if they used enough nitrogen. "But that's the end of the growing season," she said. "... So now we take April leaf samples to better assess if we need to make changes during the growing season."

Research developed an almond nitrogen budgeting tool that shows how much of the chemical is needed per pound of almonds, Ludwig said. "You have to have some to grow the tree, and soil needs a certain amount of nitrogen to feed that world," she said. "So you're assessing how much you need and if you come back in after that April leaf sampling, you can refine the amount budgeted."

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UC Cooperative Extension adviser Brent Holtz, a proponent of grinding up old trees, in an article at www.tinyurl.com/nf7rjug

Researchers also are looking at alternatives to burning trees at the end of their life span. "Annual prunings of almond trees often are chipped and put on the ground," Ludwig said. "Woody biomass takes a while to break down. California soils are very low in carbon, so regularly adding compost, composted manures and chipping helps. The other thing we've done in testing is grinding up whole trees and putting them back into the ground."

The board is looking for almond growers "who are game to work with us" to develop the protocol, Ludwig said. "We have data that looks like it would fit into it, but ... we need growers to test things out, we need draft protocols to test."

The question is, she said: "Can we write it in a way that works for growers, that's not just nice-sounding and works in the regulatory world only? ... We're willing to allow some trial and error to figure out how to make the protocol workable."

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