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Biofilter is good news for Merced County dairies

Technology lowers nitrogen in waste water at Hilmar test farm

By JOSHUA EMERSON SMITH

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Victor Fanelli calls it a "rock box." Scientists call it a waste-water biofilter.

Whatever it's called, this new technology promises to help clean nitrogen-rich waste water on dairy farms.

Experts see that as a potentially important step in a long-standing effort to reduce the levels of cancer-linked nitrates in the state's water supply.

Fanelli, a Hilmar dairyman, recently volunteered his farm as the test site for the experimental waste-water treatment system.

"Having this tool is going to make my life easier," said Fanelli, who runs a 750-cow farm. "If I got too much nitrogen in my water, I can run the system. That's very valuable, especially in our area."

The system pumps waste water back and forth through a series of pipes between two open-air gravel pits, creating an oxygen-rich environment that helps microbes remove the nitrogen.

"It's like a septic tank on steroids," said Joe Choperena, senior project manager for Sustainable Conservation, the nonprofit that developed the technology for dairy farms.

Traditionally, dairy farmers recycle their waste water by using it to irrigate crops that soak up the nitrogen content. But plants can absorb only so much nitrogen, and the excess seeps into the ground.

As environmental rules have tightened, many farmers have been forced to farm additional cropland to come into compliance. Others have cut back on the number of cows they milk.

Fanelli has a three-crop rotation -- corn in the spring, grass in the summer and fall, and oats in the winter. This new system could allow him to significantly scale back that operation, saving money and water.

"If this system works out the way it's supposed to, we'll have another way to stay in business and be up to the codes of California," he said.

Research data from a scaled-down waste-water biofilter at a research dairy at California Polytechnic State University, San Luis Obispo, has shown promising results.

Initial tests have found benefits not only for water but for air quality as well, such as significantly reduced levels of volatile organic compounds, greenhouse gases and odors.

"We've been meeting with the air district and they're fully on board with permitting this project," Choperena said.

Test is good news

According to a recent test, the waste-water biofilter removed 75 percent of total nitrogen in the Fanelli dairy's waste water.

That's good news for Fanelli, who is surrounded by dairies, leaving little space to expand his cropland.

If results can be repeated on a larger scale, an acre-sized waste-water biofilter system removes in a day the same amount of nitrogen that one acre of corn silage removes in about a year.

"I don't know what (operation) costs are going to occur in the future, but me being the first one and taking advantage of the situation, I could be sitting in a very good spot here," Fanelli said. "We were all pretty excited."

The project is made possible by a \$484,000 U.S. Department of Agriculture grant to install and study the system.

Installation of a pilot biofilter system is expected to cost roughly \$300,000 and be completed next fall. The final retail price is expected to come down significantly as research and development efforts continue.

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