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## **Manure money: Entrepreneur buys up waste**

**Reclamation cuts out phosphorous, protects peat bogs, yields salable soil**

By Dan D'Ambrosio

Franklin dairy farmer Rolland Rainville thought he had heard it all, until Tim Camisa and his crew at Vermont Organics Reclamation in St. Albans showed up at his door in mid-April.

"They came with a proposal to buy my manure," Rainville said Thursday at his 550-acre farm off Vermont 120. "I've been here 31 years, and no one has offered to buy manure. I thought before I got done farming, I'd sell some."

Camisa wanted Rainville's manure for a mobile system he has developed to extract 20 percent of the phosphorus from the waste before it is spread on farmers' fields, helping to address the problem of too much phosphorous making its way into Lake Champlain and other bodies of water in the Champlain Valley.

At the same time, Camisa is using the solids he extracts from the manure to make potting soil and a replacement for peat moss. He processes the solids at his 7,000-square-foot greenhouse in St. Albans, and plans to bag it and sell it to plant wholesalers as far away as the mid-Atlantic states.

"We're exporting phosphorus from the Lake Champlain watershed, and reducing water pollution in farmland runoff," Camisa said in a prepared statement. "We're also making better use of the materials we have here — local purchases of Vermont Organics soil will replace out of state soil products that contain phosphorus from being imported, and will help create a circular economy in Vermont."

Back at Rainville's farm Thursday, under a white tent to keep off the sporadic rain, Camisa lined up bowls of potting soil, garden soil and top soil he plans to make to show off his finished products. Camisa explained that by replacing peat moss — an element of all these products — with his product made from cow manure, he would also help protect peat bogs, which take thousands of years to form and serve to return necessary carbon to the soil.

"All we're doing is plugging in the cow product where there was peat moss," Camisa said. "It takes 30,000 years for a peat bog to form and they're a way carbon sinks back down into the ground."

Excess phosphorus in bodies of water — a worldwide issue — can lead to blue-green algae blooms such as the ones that plagued Lake Champlain in early August.

"Blue-green algae is very unhealthy for people and pets, some pets have died from exposure to it," said Buzz Hoerr, chairman of the Vermont Citizen's Advisory Committee on the Future of Lake Champlain.

Hoerr explained that the bacteria that phosphorus feeds can rob the lake of oxygen. "When you have that much food, you're feeding the low ends of the food chain," Hoerr said. "When they die off, they require oxygen to break them down, which leads to eutrophication. The best way to describe it is a water body loses oxygen over time, compromising its ability to support life."

Camisa's system works by pumping out a farmer's manure pit and running the waste through a shaker first to reduce the water content from 95 percent to 85 percent. Next, the manure is squeezed through a screw press that reduces the water content to 70 percent before the solids are carried into a dump truck by a conveyor belt to be transported to the greenhouse in St. Albans. The "squeezings" are returned to the farmer's pit or pumped directly into his spreader to be applied to his fields.

At the greenhouse, Camisa said, he has perfected a multiple-step process to turn the solids into soils the same day, ready to be bagged and shipped. He said he has received one patent on his process and has eight more patents pending.

"We can have everything bagged and palletized on the floor at the end of the day," Camisa said.

When Camisa knocked on Rainville's door in April, he told the dairy farmer it wouldn't take long to process his manure pit. He would pay Rainville for the solids he extracted, and for the nutrient value and phosphorus he took away.

"They told me originally they'd have the pit done in a week, but they've been here since the middle of April," Rainville said.

Rainville said Camisa had started with a six-inch screw press, then replaced it with an eight-inch press, and now a 16-inch press to dramatically increase the volume of manure that could be processed.

"They were only processing two truckloads a day, they should be able to do a load every half-hour now," Rainville said. "They're learning; I'm learning. If they can process the manure fast enough farmers will be willing to do it. That's going to be the key."

Camisa said there were about 15 farmers at the demonstration Thursday.

"They were very open-minded. We had some good conversations," Camisa said. "Dairy is a tough business. They're looking for extra income."

Julie Moore, water resources group leader at Stone Environmental, a consulting firm in Montpelier, said Thursday that Camisa's process has "real potential value," but that it will be important to carefully balance how many nutrients he is taking away from manure pits in the solids he's removing.

"Solids are a combination of nutrients and carbon," Moore said. "It depends on what a farm's nutrient balance looks like. That carbon can be pretty important for soil health, particularly where people are growing corn and other annual crops."

Camisa said most farmers have a nutrient management plan, and that he'll work within that plan.

"If this guy is creating 1,500 yards a year of solids, he might only want to sell me 500, whatever he thinks he doesn't need," Camisa said. "They won't be able to sell me everything all the time. It's a balance."

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