

Firm fights lake pollution with shale and biochar

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By Christopher Ross



ROCK DUST LOCAL LLC founder Tom Vanacore surveys the remaining supply of shale dust at Wilcox Quarry in Shoreham. The recipient of a \$25,000 state grant, Rock Dust Local uses the byproducts of road-material mining to create amendments that help prevent agricultural soils from polluting the state's waterways. Independent photo/John S. McCright

BRIDPORT — Rock Dust Local LLC, a Bridport company founded by Tom Vanacore, last week shipped out 80 tons of freshly broken Addison County shale mixed with biochar — enough to cover 40 acres of Champlain Valley farm fields.

Vanacore is betting the dark gray mixture will convert excess phosphorus into mineral form and prevent it from making its way into Vermont streams and ultimately Lake Champlain.

“Bench top experiments have shown that the local shales when properly handled have the potential to capture approximately 50 pounds of (phosphorus) per ton of natural rock,” Vanacore wrote in a description of his company’s product. “This material represents a ready and existing technology for land applied mitigation of phosphorus at the most cost effective price.”

The state of Vermont is betting that Vanacore is right.

In September Rock Dust Local earned a \$25,000 grant as part of the Vermont Phosphorus Innovation Challenge (VPIC) to manufacture, apply and study mineral and mineralized soil amendments with an eye toward managing solution-reactive phosphorus.

Launched in April by Gov. Scott with the hope of addressing the phosphorus imbalance that has for decades polluted Vermont’s waterways, the VPIC asked a simple question: “What if, rather than waiting to manage phosphorus after it hits the ground, we capture it from manure before application?”

Vanacore’s answers a different question: How can we manage the phosphorus that’s already in the ground?



“It wasn’t exactly what the governor was looking for,” he said. “But we need many approaches to the phosphorus problem.”

After extensive testing, Rock Dust Local has determined that several kinds of Vermont shale have the potential to capture a sizable amount of phosphorus in fields and forests. Adding biochar, a charcoal-like soil amendment, triples the capacity of the shale to suck up the phosphorus.

Fortuitously, Vanacore said, that shale is already being mined in Shoreham and Swanton, and some of the waste from the mining process is just the right size to be used in agricultural “remineralization” and phosphorus management.

“The dust has precipitates that, when exposed to solution-reactive phosphorus, mineralize it onto the exposed surfaces of the dust,” Vanacore explained.

He calls the Shoreham product “St. George Black,” which he mixes with biochar to get “Phos-Cap 2/1,” which is literally just spread on the ground, where it can sequester phosphorus.

Last Thursday, on a frigid gray day in Shoreham, he and George Wilcox of Wilcox Quarry oversaw the delivery of 80 tons of Phos-Cap to Deer Valley Farm in Ferrisburgh. The delivery required three trips by truck.

Deer Valley is one of several farms in Addison and Franklin counties where, on areas totaling roughly 200 acres, Vanacore will conduct “weathering” tests and gather other scientific data to determine the longevity of Phos-Cap in the field and its effectiveness at controlling solution-reactive phosphorus.

Rock Dust Local is providing the material for free to the farms, after offsetting its costs with the grant money.

“I’m basically taking the money from the grant and passing it along to farmers,” Vanacore said.

A mason and stone carver for three decades, Tom Vanacore knows stone. He’s worked for decades with rocks and minerals, as well as the mines and quarrying operations that produce them. Over the years he’s also repaired and restored a number of local buildings and monuments. These days, however, he has taken up the challenge of repairing and restoring agricultural soils.

Phos-Cap has been tested by the University of Vermont and by Ted Wysocki, a researcher with the New England Small Farm Institute and the operator of South Meadows Farm and Research Center in Wales, Mass., which focuses on mineral and biocarbon interactions for nutrient management.

“It outperformed everything,” Vanacore said of Phos-Cap.



A LOADER OPERATED by George Wilcox of Wilcox Quarry in Shoreham fills a Bronson Transport truck last Thursday with a mix of rock dust and charcoal, which will be used on a Ferrisburgh farm to isolate phosphorus and prevent runoff. The 80-ton order, enough to cover more than 40 acres, required three truck trips to deliver.

Independent photo/John S. McCright

In the context of the VPIC grant, Rock Dust Local's engineered applications are in the "proof of concept" phase.

"I suspect the next phase is scaling up for all of this," Vanacore said.

The VPIC awarded a total of \$240,000 to six Vermont companies working on practical technologies to get phosphorus out of Lake Champlain and other Vermont waters.

"While we continue with traditional approaches to restoring and protecting our waterways, this challenge seeks a proactive solution to our phosphorus imbalance and water quality challenges," Gov. Scott said in a press release. "It brings together the public and private sector, combines science, technology and innovation, and creates a new model around phosphorus by promoting economic growth, environmental sustainability, and societal benefits."

The next stage of the challenge will involve full-scale implementation of one or more of the six projects.

"The 'reverse-pitch' VPIC was really geared to engineered applications, i.e., point source manure management as add-ons to existing anaerobic digesters in a 'plug-and-play' application," Vanacore said.

Rock Dust Local, on the other hand, with its decades of experience working with mineral fertilizers in a nutrient-management setting, is thinking outside the box.

Ultimately, an all-of-the-above approach to phosphorus management will be needed to solve Vermont's water-quality problem, Vanacore believes.

"One size doesn't fit all," he said.

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