

Decisions before you dive into a digester

by Laura Brenner

THERE'S been much talk that renewable natural gas produced by methane digesters could be the next cash crop on dairy farms, while reducing the industry's greenhouse gas emissions. Methane results from the anaerobic breakdown of solid particles in organic matter — in this case, dairy manure. The solids become volatile, meaning they can easily transform to a vapor. In 2019, the Environmental Protection Agency (EPA) found that methane accounted for 10% of greenhouse gas emissions in the United States, second only to carbon dioxide (80%).

Methane is 25 times more effective at trapping radiation than carbon dioxide, despite its shorter lifespan. However, Frank Mitloehner from the University of California-Davis explained in a recent webinar that it's also a "flow gas" and is naturally destroyed in the atmosphere. This means that if the number of cattle in the United States flatlines, methane levels from cattle will remain stationary, but when cattle numbers rise, total methane emissions may overflow the proverbial atmospheric bathtub. Experts like Mitloehner believe anaerobic digesters that capture methane from manure are a solution to help the dairy industry reduce this impact while also offering a way for farms to diversify their income streams with a steady land lease or selling waste resources.

One process, three benefits

Covering a manure lagoon eliminates oxygen within the lagoon, triggering methane production

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through the breakdown of manure solids. The lagoon cover traps the off-gassed methane, which is the main component in biogas. When the biogas is cleaned, it can be turned into a saleable renewable natural gas (RNG).

RNG can be used to replace diesel fuel in vehicles, allowing farms with methane digesters to remove methane from their business and carbon dioxide from vehicle emissions. Mark Stoermann, who has worked with numerous digester projects and now helps lead the dairy checkoff's nutrient management organization, Newtrient, likens this to "double dipping." But that's not the only two-for-one deal with methane digesters: digested manure is also a more effective fertilizer.

"The digester process stabilizes manure and makes more nutrients available to plants in the first year, leading to better yields in year one," explained Stoermann during the panel discussion hosted by Cainthus.

The right relationship

Farmers interested in the environmental and economic benefit of adding methane to their list of "crops" have options for structuring the relationship with a contractor and the facility. Like solar installations, energy companies will lease land needed to build a digester. The digester is often owned and operated by a third party, which Stoermann advises for most landowners who don't already have experience in commercial energy facility management.

Minnesota dairy farmer Michael Crinion explained another option. He partnered with Dynamic, an



organic waste solutions company, on his farm's digester project. Under their agreement, Dynamic will rent manure from Crinion for 21 days. They'll capture the methane, then return the manure to Crinion three weeks later.

Both Crinion and Stoermann shared the same advice for farmers considering monetizing their methane: It's a long-term relationship, and you have to pick a partner that is a good fit for your farm, shares your values, and considers the next generation. Stoermann suggested asking to see three other facilities already installed by a company before committing to a contract. And if you do sign a letter of intent, keep the terms to six months. Any longer than that could be a red flag for weak financial backing or construction contracts.

Accessing a market

There's an opportunity for farms to generate income not tied to the meat or milk market, explained Stoermann. But a farm should consider three things before moving forward with a digester project: organic matter produced on the farm, access to state incentive credits, and proximity to renewable gas markets.

The panelists agreed that digesters are best suited for larger farms, although Stoermann explained that manure could be mixed with other organic matter, such as food and human waste, in a co-digester to create enough material to make the digester more financially viable. Still, the payout might be less because the Renewable Identification Number (RIN) credit as determined by the EPA is lower.

More so than size, Stoermann stressed that the demand for new methane digesters comes from emerging RNG markets and a farm's ability to tap into an RNG pipeline. Right now, that demand comes mainly from California. Farmers in nearly any state can tap into the RNG pipeline that feeds California. According to Crinion, the Interstate-29 corridor in his part of the country has become a hotbed for methane digesters. Other states, including some on the East Coast, are considering a financial incentive like California's Low Carbon Fuel Standards credit but are not offering one yet.

Innovations such as new markets could help methane digester technology reach more dairies and allow them to capitalize on this expanding opportunity. 🐄

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