

# Satellite manure storage allows more flexibility in manure storage placement

Building a second engineered satellite storage is a team affair at the 1,260 cow Twin Birch Dairy, LLC and is part of the farm owner's vision of environmental stewardship.

The first satellite storage was built 13 years ago when little information was available about their implementation on farms. The new additional storage will allow the farm to have nine to 10 months of storage. This will help them avoid application during winter when risk of runoff is greater and to apply in spring when manure can be incorporated for full advantage of nutrients.

"Sometimes the soil at the farmstead does not have a high enough clay content for lining a storage, so a satellite location opens up options," said PRO-DAIRY specialist Karl Czymmek.

The farm worked with Agricultural Engineering Services (AES) to create design drawings with site slopes, setbacks and erosion control. Dana Chapman, professional licensed engineer and principal at AES, evaluates each site individually, including the elevation, topography, the surrounding area, water course, wetland determination, laboratory analysis of soils and setbacks from flood plains. Aesthetics, including road path if trucking, accessibility, neighbors, visibility and wind direction, are also considered.

"All these things need to be thought about. I think the biggest thing is to look at the big picture," Dana said. "The first step is to satisfy the landowner's needs. Then to look at the obvious, including wetlands, soils, streams and the CNMP for the farm. I make sure the farmer has done his own research. My ultimate role as a technical adviser is to make sure state standards are met."

The system at Twin Birch was designed to work with digested manure and has "a lot of brains built in." At this point maintenance is easy. "It's really easy now. It starts up, runs, fills up and stops," Young said.

Implementing the first storage, while ahead of the curve, made good business sense for the farm.

"In my mind it was the cheapest way out. It was \$22,000 less than the cost of a manure spreader. It was just the cost of doing

business," Young said. "We needed winter storage. I wanted to not add odor because we live across from a golf course near Skaneateles Lake. The farm is at the bottom of the hill and I didn't want manure trucks on the road. There were a lot of unknowns. It was a big leap of faith. We also committed to manure separation at that time."

Manure was pumped 7,500 feet over an elevation change of 220 feet. They have lines for multiple fill stations, and have used drag hose equipment for five years.

Young now uses a 20 hp electric pump to move manure all the way to storage. It has safe guards built in to limit any possible spills.

"There is a learning curve, especially with pumping up a gradient," Young said. "Part of it is to get the hard knocks experiences so we don't repeat mistakes."

Young recommends to:

- Develop a team of experts to help you. "Not one person knows all the right answers," he said.
- Begin planning at least six months before you would like to break ground on the project.
- Use stainless steel for riser pipes for longer life.
- Bury the line so it doesn't freeze. Young opts for five feet deep, which is below tile lines.
- Do not cap ends so pressure doesn't build. "You have to leave the system open so pressure from methane gases doesn't build."
- Check local laws and regulations. Some local municipalities may require a building permit. DEC must be notified 30 days before a new storage is filled. Make sure to apply for a tax exemption for the project.
- Engineer storage and transfer lines to stay in compliance with environmental regulations. "Standards are absolutely important," Young said.
- Follow a regular maintenance schedule, including weekly checks of the manure line. □

*Julie Berry edits The Manager for PRO-DAIRY.*

per acre," he said about Dr. Quirine Ketterings, who leads Cornell's Nutrient Management Spear Program.

Potter said that his Ontario colleagues believe use of the Veenhuis improved hay yields.

"The Veenhuis gets the manure to the root system with mechanical components that don't seem to hurt the plants. I think the way it functions and places the manure benefits the crop. It also achieves odor control and has the environmental benefit of keeping the manure where you want it to be," he said.

Cornell's Nutrient Management Spear Program worked with Potter to conduct initial tests in 2012 to examine the Veenhuis unit's impacts on grass and alfalfa growth and yields. Initial results showed manure application to hay stands increased yields with no yield differences between plots where manure was surface applied and those where injection was done.

"These findings would suggest that injection can be done without

damaging the hay stand and while reducing odor issues, ammonia emission and risk of phosphorus runoff," Ketterings said.

With recent funding from a USDA-CIG grant and in collaboration with the National Fish and Wildlife Foundation and Chesapeake Bay Stewardship Fund, the team is currently further evaluating the impact of manure injection with a Veenhuis unit into both grass and alfalfa stands.

One thing is certain, serving farms' manure management needs is a long term business venture. Scott and Dan Potter and the DSSC staff stay busy and plan to keep an open mind towards equipment options as technology and customer needs change.

"Keeping manure nutrients where they help the crop has a great economic benefit, and with public awareness about manure's potential impacts on the environment, it's an important business practice. Our job is to help farmers manage manure effectively and we're happy to be doing that," Potter said. □