

## MANAGING MANURE

By Lisa Fields

# Grass injector provides a manure management option

Scott Potter is involved in manure management almost every day. Potter and his brother Dan own Dairy Support Services Company, Inc. (DSSC) in Truxton, NY, a custom manure application and crop harvest business. They have 11 employees and apply 60 million gallons of manure to crop fields each year.

“Our business is pretty much split 50/50 between manure application and custom crop planting and harvesting. The manure business is equally split between truck mounted and tractor drawn liquid tank spreaders and two drag hose systems. Currently our customers request manure spreading on corn, hay and small grain fields.”

Potter said custom manure application and manure management practices have changed.

“We started out with tanker trucks in 1994, and introduced application of manure with a drag hose unit in the late 1990s. That gets the manure spread without the weight of a tanker or truck, which benefits the soil and crops by avoiding compaction that the heavier equipment can cause. As nutrient management practices have gotten more precise, it’s often preferred to incorporate the manure into the soil during application or soon afterwards. That captures the ammonia portion of the nitrogen so it doesn’t go into the atmosphere and is available to the crop. Incorporation also reduces odors and run-off potential,” he said.

Potter said incorporating manure has benefits beyond retaining nutrients on the field.

“When applying manure to growing alfalfa and grass fields it’s important to avoid leaving it on the surface as it can have a burning effect on plant tissues,” he said.

DSSC can deliver manure to the field either with trucks or the

**Injection reduces phosphorus runoff risk and ammonia emission.**

drag hose.

“The trucks all have splash plates for surface application so the manure gets broadcast in a swath. Splash plates can be used with the tanker or drag hose unit in addition to four other options for applying manure. On corn or sod ground, DSSC has three Aerway® units for shallow incorporation with minor soil disturbance. On corn ground, the no-till injector using Detrich points gets manure beneath the surface with minimal soil disturbance

and the chisel plow gets the manure to an 8 to 10 inch depth with full tillage incorporation. For hay fields, the Veenhuis (pronounced as “Vain-house”) grass injector gets manure beneath the growing plant and a couple inches below the soil surface without tearing up the plants,” he said.

Several factors are critical to choosing which piece of equipment to use on particular fields.

“The soil type and recent weather, crop nutrient management plans, consistency of the manure and customer preference all determine the choice of incorporation method. Manure application to hay ground can be challenging. The goal is to capture manure nutrients without damaging crop plants, and to also avoid odors that can be objectionable to neighbors during hot summer weather. The Aerway® is the first tool we used to incorporate manure into sod. It moves across the ground with knife-like tines that cut the manure into the top few inches of the field. The Aerway® works great on pastures and it’s a good tool for use on wet or steep ground. It also brings up stones which can be a big problem on harvested hay fields,” he said.

The Veenhuis grass injector unit, developed and manufactured in the Netherlands by Veenhuis Machines B.V., is a fairly recent addition to DSSC’s equipment line-up. In contrast to the aerator’s tines, the grass injector is designed for use on sod with smooth cutting discs spaced about seven inches apart that slice a few inches into the soil. A chopping distributor sends manure to the soil surface through hoses and rubber boots mounted directly behind each disc. And unlike the Aerway’s aggressive tines, the cutting discs of the Veenhuis don’t appear to damage plant crowns or alfalfa’s tap roots.

“I first learned about it from Quirine and her staff after they took a trip to the Netherlands where it’s used quite a lot. Contacts of mine in Ontario have one and were really enthusiastic about it,” Potter said, “so I went there to have a look. It seemed very reliable, mechanically. It’s designed to incorporate manure applied on sods at lower rates of 2,000 to 6,000 gallons per acre. We generally use it for application rates of 4,000 to 6,000 gallons, but have found it also works quite well at higher rates of 10,000 gallons or more

*Scott Potter demonstrates manure injection into a hay crop with the Veenhuis grass injector unit, developed and manufactured in the Netherlands.*



# 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. □