

Making Sand Lane Manure Separation Work in Michigan

By Laura Moser



When Tony Jandernoa was looking to update his manure handling system he wasn't interested in adding more machinery that would need to be maintained. What he was interested in was a simpler way to remove sand from the manure stream leaving the barn before it went into holding lagoons.

After a disappointing experience with mechanical sand separators, Tony was back to every other day manure hauling. With an expansion underway and pending regulatory changes, he was looking for a better way to handle the manure — particularly the sand.

“We knew we would use a lagoon system, we just weren't sure how we were going to get the sand out of the manure before putting it in the lagoon,” Tony says. “Being

able to remove the sand allows us to reuse it for bedding and is easier on the manure pumps.”

On a trip to the World Ag Expo in California in 2005 he observed the use of sand lanes for manure separation. He was told by skeptics that the process would not work in Michigan due to winter freezing. After evaluating the costs and operations of the sand lane, Tony was willing to take the risk to be the first dairy operation with a sand lane in Michigan.

“I figured that even if we had to shut it down for three months in the winter, I was still farther ahead than using a mechanical system,” Tony says.

Tony, who milks 900 cows in the St. Johns area, visited operations in California to draft his design

ideas. As the first operation to install a sand lane in Michigan, he has worked closely with officials to meet environmental regulations.

“We basically learned as we went,” Tony says. “There are things we would do differently now but overall the system is working.”

The concept of the sand lane is rather simple: allow gravity to pull the sand out as it travels down a cement lane. On Jandernoa's operation they installed a 12' wide, 300' long sand lane with a one percent slope for the manure stream to travel down. A flume from the barn brings the manure stream into the lane, the gravity and pressure from the flume causes the sand to drop out as the stream travels down the lane. At the end of the lane the organic matter is pumped into a three-stage lagoon system.



(pictured left) The “T” outlet allows the water to flow through, leaving the organic matter behind in the lagoon. (top) Tony Jandernoa, St. Johns, Mich., installed one of the first sand lane for manure separation in Michigan.

The first and second lagoons are equipped with a T-shaped outlet that allows the water to flow through and the organic matter to settle out. By the time the manure stream travels to the third lagoon it is “dirty water.” The water from the third lagoon is used to flush the manure down the flume. The first and second lagoons have capacities of two and three million gallons and the third lagoon was the existing 6 million gallon lagoon expanded to hold 8 million gallons. With these capacities, the lagoons are hauled out three times a year.

The sand captured in the lane is hauled out with a loader and left in piles to dry. The initial pile is placed close to the lane so any liquid can drain back into the lane. From there the piles are moved until they are dry and ready to be used as bedding again. Typically the sand is ready to go back in the barn in two to three weeks.

“We are reclaiming over 90 percent of our sand to use in the barns,” Tony says. “We have learned that it is very important that the sand be completely dry before trying to reuse it.”

Tony estimates that it requires one employee six to seven hours, twice a week to manage the manure process. The simplicity of the system is what appealed to Tony. Aside from two 20 horse power Valley Farm Supply shaft turbine pumps, there is little mechanization to the system, and therefore less to fix and replace.

“The concrete lane will probably be here forever,” Tony jokes.

After two years of use, Tony is preparing to completely drain the third lagoon and start over with 3 million gallons of clean water. “It is important that the water in the third lagoon stays cleaner in order for the sand to be reused. After two years the water is dirtier than we would like it to be,” Tony says.

One of the things Tony would change in his design is to have two “stages” with four lagoons so he could shut down two to be pumped out while the other two complete the process. Now he has to shut down one of the two initial lagoons when pumping which causes the water in the third lagoon to get a little dirtier.

Winter Time Use

The largest unknown for Tony was how the system would operate in the winter. After two years of operations, they have only had to shut down for a week because of the cold. Tony’s trick to keep the system working in the cold is to start up the pumps every 15 minutes to keep them from freezing.

“We installed timers on the pumps so they will start and run for a few minutes to keep everything from freezing up,” he explains.

Tony admits that the learning process hasn’t been without challenges. But through it all he is glad he went with the sand lane separation system. “We made some mistakes,” Tony admits. “But we were starting from nothing. We now have a neighbor using the same type of system and more people showing interest in it. It is just another option that works well for us.”