

Sand-Manure Separator Allows Wisconsin Dairy To Double In Size



**“The simpler
we can keep it,
the better off
we’ll be.”**

Mark Faheey
Prairieland Dairy

Prairieland Dairy, located in Belleville, Wis., had been using sand bedding successfully for over a decade when in 2011 they decided to expand their dairy operation from 750 to 1500 cows.

Sand bedding, as is used at Prairieland, provides a comfortable material for the cows to lie upon; it stays cool in the summer, provides excellent traction, readily drains moisture and limits bacterial growth. From a farmer’s budgetary perspective, sand is relatively inexpensive and readily available in most parts of the country.

Mark Faheey, Prairieland Dairy owner, has seen the benefits of sand and knows that happy cows produce quality milk. “If the cows are not clean and comfortable they won’t be profitable,” said Faheey.

Problem

As with any dairy farm expansion, there were a number of local and federal regulations that would require Prairieland’s owners to obtain permits and make plans for waste storage. For instance, the state of Wisconsin regulates waste storage structures and manure application at large farms under the U.S. EPA Clean Water Act’s pollutant discharge permit program. This is known in Wisconsin as Wisconsin Pollutant Discharge Elimination System (WPDES).

One of the regulation challenges Prairieland faced was to address a need for better sand-laden manure management. In addition to its many benefits, there can be challenges associated with sand bedding. Sand is abrasive and when laden with manure can become very heavy. Even before expansion, Prairieland was having issues pumping the sand-laden manure and was constantly replacing hoses and rings as the abrasive sand accelerated equipment wear. They also found that their manure transport tankers remained half full of sand after applying manure to the fields, making heavier tankers a potential hazard during transport on local county roads.

In addition to the equipment issues, Prairieland’s lagoon that is used for capturing the liquid manure was holding 30 percent of the sand. Prairieland was losing sand in the fields and in the lagoon, as well as replacing equipment parts more often. “We needed to get rid of the headaches,” said Faheey.



Solution

When planning began for the dairy expansion, Faheey met with McLanahan and their local dealer, Komro Sales and Service, Inc., to discuss an enhanced manure management plan and to identify any equipment that could more effectively handle the increase in sand-laden manure. Faheey remembers his words from their first meeting: "The simpler we can keep it, the better off we'll be."

McLanahan and Komro recommended a high-diluted flush flume manure system to solve Prairieland's sand manure separation problem. The process starts at the stalls using water gravity flumes to carry the sand-laden manure from the stalls to the waste storage building. During this process, sand separates from most of the manure and is collected by a McLanahan Inclined Manure Auger. The manure solids continue downstream to a reception tank where they are pumped into a Liquid Solid Separator that separates the liquid from the solids. The solid manure with fibers are then stockpiled and used for fertilizer.

Captured sand moves from the Inclined Manure Auger to a McLanahan Sand-Manure Separator, which has a 72' (21.9 m) long auger moving at a slow speed with recycled water from a closed loop system applied through nozzles at one gallon per minute (gpm) in order to rinse the sand off manure. The clean wet sand is then fed to a McLanahan Sand Dewatering Screen, or shaker, which dewater/removes moisture from the sand, producing a dryer product.

Results

Since the installation of the McLanahan Sand-Manure Separation System Prairieland has seen significant savings. "We would go through 14 truckloads of sand a week, now we only require two to three truckloads a month as we're getting back 95 percent usable sand from the separating process," said Faheey.

The recycled sand has also proven to be a non-health risk to the cows as somatic cell counts have remained in a safe range of 120,000 to 150,000.

In addition, the farm equipment has seen less wear, transportation of the manure has been safer due to the reduced weight, and Prairieland is losing less sand in their lagoon.

Prairieland is finding the McLanahan system to be low maintenance as the equipment is manufactured with larger tolerances and abrasion resistant iron and steel alloys able to stand up to the abrasive nature of sand. "The system is low maintenance as long as you keep an eye on it," said Faheey. "It's one of the reasons we're now producing 95 pounds of milk a day."

