New Storage Design for Sand-Laden Dairy Manure

A.S. Leaflet R2093

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Summary and Implications

Storing sand-laden dairy manure has been a problem because normal rainfall and milking center wastewater makes it liquid. Couple this with the average sand usage which is ~ 40-65 pounds / freestall / day. Pumping 7-11 tons of sand per cow annually wears out the agitating and loading pumps quickly. With the concept originating at Kansas State and being modified by an engineer, Arlo Habben from Minnesota, we now have a workable two stage system that saves 50 percent on hauling cost also. The first stage is a solid storage which has 24 inch square risers to drain out most of the moisture and rainfall to a second pit. The first pit is loaded by pushing the barn manure out one end of the barn over a vertical wall. The first stage is also sloped 1 percent to the perforated risers on the lower side. The second stage storage receives the milking center wastewater directly. One storage system like this has been built in NE Iowa and another one is under construction. Both of these farmers plan to utilize a towable irrigation system to empty the second stage. Open houses will be planned for both when they irrigate early next summer.

A presentation was given at the July 2005 4 State Nutrition and Management Conference in Dubuque. Copies of the paper and design are found in the proceedings or can be obtained from Dan Meyer at Fayette County Extension Office (djmeyer@iastate.edu).

Sand has been a preferred bedding material because the somatic cell counts are often lower than using mattresses with bedding on them. This can translate into an annual $50 to $100 per cow savings. There is another $30 to $50 per cow which can be saved by irrigating the dilute second stage versus hauling it with a tank wagon. Many storages are not being built for sand bedded free stalls so there is more field runoff of nutrients in the spring. These nutrients could be saved so dairy farmers would need to buy less fertilizer.

Figure 1. Scraper loading of sand-bedded dairy manure storage.

Figure 2. Shredded bark above chamber waste distribution pipe.