Iowa Odor Control Demonstration Project: Solids Separation

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TECHNOLOGY DESCRIPTION

Separating solids from the liquid waste stream shows promise in helping to reduce odor emissions from livestock operations, especially those with anaerobic lagoons. Six cooperators are demonstrating solids separation as part of the Odor Control Demonstration Project.

Manure solids can be separated by settling tanks or mechanical separators. Mechanical separation works well for beef and dairy manure. Settling tanks are better for swine manure. Mechanical separation is less effective for swine because the solid particles are so small. Research shows screen-type separators can remove 30 percent to 60 percent of the total solids from cattle slurry, but only about 20 percent from swine slurry.

As the solids are removed, less manure is loaded into lagoons, resulting in reduced odor. Smaller lagoons (those with less surface area) or those that are more lightly loaded have less odor production potential than larger or overloaded lagoons.

Iowa Department of Natural Resources rules allow slightly smaller lagoons if livestock operations separate solids. The size reduction is proportional to the solids removal effectiveness.
EFFEVTIVENESS

Solids separation, as a method of reducing odors, has not been specifically evaluated. However, researchers studying odors have observed reduced odors from lighter-loaded lagoons. In addition to reducing lagoon surface area, producers using solids separation to reduce odors must handle the separated solids so they do not become an odor source. Composting or immediate land application are the methods recommended by researchers.

COST

Solids separation expenses include the costs of the equipment and some additional utilities. The additional utility costs are incurred in pumping liquid slurry through mechanical separators. Pumps of three to 10 horsepower are typically used. Based on requests for reimbursement for the Odor Control Demonstration Project, the initial fixed costs of mechanical separation are about $135 per dairy cow; initial settling tank costs are approximately $25 per sow, or $7 to $10 per finishing pig space. Utility costs usually would not increase with settling tanks.