

Choosing A Manure Treatment System: Questions to Ask

Introduction

There is a wide array of manure treatment systems being promoted to agricultural producers by different companies and individuals. Learning about the different treatment systems is an excellent first step in solving manure-handling problems. This fact sheet describes some of the important questions to ask when discussing treatment systems with vendors and reviewing a manufacturer's literature.

Odor Control

Will odors be reduced? If not, how will they be controlled? Find out which gases will be emitted by the system, and their concentrations.

Management and Labor Requirements

How much management and labor are required for proper maintenance and operation? How complex are the equipment and the processes? Treating manure means more will be done to it than simply transporting it to storage, then out to the fields.

Mass and Moisture Content

What is the flow of mass through the system? Where does the material go, and in what form? Find out where the solids are, what forms they are in, and their moisture content. Knowing the solid content of the material is required to determine the best way to handle it. Separated solids that are 18% solids are a much greater problem to deal with than separated solids that are 40% solids and ready for composting. Beware of promises of a dischargeable liquid. Discharging a treated liquid into surface water will require a permit and extensive continuous testing.

Nutrients

Where do the nutrients go? They also have to go somewhere. If phosphorus (P) removal is involved, find out where the P goes and how much is left. If

nitrogen (N) removal is proposed, it is important to find out what form the N will be in. The preferred form for removal is N_2 gas, which has no environmental concerns. On the other hand, ammonia (NH_3) and nitrous oxides (NO_x) do have negative effects on the environment, and federal law regulates emissions of these gases.

Find out the form of the nutrients. While some processes convert the nutrients into forms more available to plants (soluble P, nitrate, ammonium), soluble nutrients can be lost to the environment more easily than organic forms. Find out the concentration of nutrients in any material to be applied to cropland.

Since treatment systems vary greatly in the amount of nutrients they remove from manure, it is essential to know if there is enough cropland for spreading a farm's manure, as determined by a Comprehensive Nutrient Management Plan. Make sure the plan includes the New York Phosphorus Runoff Index, a risk assessment tool that evaluates the potential for each field to lose P. The P Index may set limits on the amount of manure that can be spread on certain fields. Some fields may not be allowed to receive any more manure.

Pathogens

Are pathogens reduced by the treatment system? If any material is applied to cropland, find out if there is a significant reduction in pathogens. If solids are sold, consumers may need the same information.

Heat Generation

Can "waste" heat be utilized? Some treatment systems give off heat. Can this be used on-farm? How much heat will be available during each season of the year and what temperature will it be?

Energy Requirements and Generation

What will the energy requirement be to operate the system? Will energy be produced? How much and how will it be used? Who will deal with the utility?

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Pretreatment Requirements

Will the manure supplied to the treatment system need to be modified in any way? Temperature and solids content are often important to the treatment system. This may require modifications in the bedding used and the amount of wash-water included. There may be limits on the amount of chemicals allowed (such as used in footbaths) and the ability to handle shock loads, such as a load of dumped milk.

Additives and Amendments

Are there any materials that need to be added during the treatment process? Precipitating and flocculating compounds to remove P may need to be purchased on a continual basis. Amendments needed to increase the solids content for composting can be budget busters. Other additives to increase digestion efficiencies may require permits, and may place the operation outside of agricultural and into industrial regulations.

Storage

Will the treatment process be continuous? If the treatment system is shut down, where will the manure go? Is storage included? Significant amounts of untreated manure may need to be handled, and even the treated manure may have to be stored. There may be changes in the nutrient content and form of the treated manure as it is stored.

Site Requirements

How large an area will be needed? Some processes have a small footprint, while some are very large and can take up tens of acres. If considering earthen structures, does the site have the right soils?

Design and Service

Who will design the system, provide startup assistance, and continuing support and advice over the

life of the project? How much time per day will be required to operate the system?

Finances

What are the costs of each component as well as the overall system? Who pays for what? Who is responsible for operation and maintenance costs? What is the projected revenue from by-product sales, and who is responsible for marketing? What is the life expectancy of the equipment? Involve lenders early in the selection process for their input on which systems are financially feasible.

Experience of Other Farmers

Perhaps the most important question to ask is whether a given treatment system has been installed on a farm like yours. If the answer is yes, contact the farm and find out whether or not they are satisfied with the system. (Make sure to have permission from the owner before sharing information about the operation with others.) How long has the system been operating? If they could do it over again, what would they do differently, and what would they do the same? If no farm can be found that uses the proposed treatment system, then let the buyer beware.

Further Information

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Available from the Natural Resource, Agriculture and Engineering Service (607-255-7654):

2005. Dairy manure management: treatment, handling and community relations. NRAES-176.

2001. Dairy manure systems: equipment and technology. NRAES-143. <http://www.nraes.org>

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