

Lesson 3: Livestock Manure Management Systems

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Everyone involved in farmstead planning for livestock operations needs a basic knowledge of manure management. Acceptable management practices are dependent on factors such as the size and type of operation and soil conditions. Research into the requirements for the use of manure is therefore imperative for each livestock operation.

Principles of a Manure Management System

Animal manure contains materials, including nitrogen and, to a lesser degree, phosphorus, that can be harmful when concentrated in large quantities. Effective manure management is required for any operation to manage these substances, but with the development of larger operations, particularly in the beef, dairy, swine, and poultry industries, the complications of dealing with large amounts of manure have increased. The potential for manure to enter surface and ground water is, in most circumstances, the greatest threat, and the main goal of manure management systems is to prevent this type of pollution.

A manure management system generally consists of some sort of manure storage and handling. For livestock operations in which the animals are kept on a well-maintained pasture, manure storage and handling is generally not an issue, because the livestock manure is spread throughout the pasture. However, when animals are kept on lots or in some sort of confinement system, the manure that they produce must be handled efficiently to avoid pollution, maintain sanitation, and make use of the nutrients in the manure for fertilizer. Producers have a number of options for managing manure; the methods chosen will depend on the conditions of the livestock operation. Common storage options include pits underneath buildings with slotted floors, storage tanks, and lagoons. Common methods for applying the manure to fields as fertilizer include pumping it through irrigation systems and applying it to the land using some type of mechanical spreader.

The exact type of manure disposal system needed will be dictated by many factors, such as the size and type of enterprise, its location, costs, local zoning regulations, the volume, odor considerations, proximity of neighbors, and use of manure as fertilizer for crops. While the type of system or practices that will be required to operate successfully will vary, most systems are strictly regulated to protect the environment.

Regulatory Agencies Involved in Manure Management

The number of agencies and specific divisions of agencies that are involved in livestock manure management is growing and evolving as the issue of handling manure effectively becomes more critical. Help can be obtained from the following agencies at the federal, state, and local levels; referrals from these agencies will lead to answers for most questions. Most of these agencies also make information available on the World Wide Web.

Department of Natural Resources (DNR) - The Missouri Department of Natural Resources is a state agency that monitors natural settings, evaluating soil and water quality and the effect of pollution. They enforce regulations concerning pollution. This department may provide information about designing manure management systems.

Environmental Protection Agency (EPA) - The EPA is a federal agency responsible for the enforcement of federal environmental policies and laws. The agency provides information on the laws and rules governing the use of manure. This information would be especially useful when designing the system.

Planning a Manure Management System

Farmstead planners should carefully research the different types of manure management systems available and obtain professional help as needed. This aspect of the farm plan should not be taken lightly; whatever system is chosen, it must work properly for the enterprise to be successful. The regulatory agencies listed above will be of some assistance in choosing a manure management system. The following sources of information may be able to supply specific designs and referrals to other sources. These sources can be located through phone

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directories, library reference services, or Web searches.

- Natural Resource Conservation Service (NRCS) offices
- Associations for a particular species of livestock (such as the National Pork Producers Council and National Cattlemen's Beef Association)
- Private agricultural engineering firms
- For producers with contracts with large corporations, engineers who assist with design that are hired by the corporation

Summary

The main goal of manure handling systems is to prevent the pollution of surface and ground water. Depending on the type of livestock enterprise, manure management can be very involved. Planning for an appropriate system may require

- University Extension offices

research involving government agencies, livestock associations, and other sources of information.

Credits

Animal Waste Regulations for Livestock Producers in Missouri (WQ200). University Extension Agricultural Publications, 1993.

Ensminger, M. E. *The Stockman's Handbook*. 7th ed. Danville, Ill.: Interstate Publishers, 1992.

Steele, Kenneth. *Animal Waste and Land Water Interface*. Boca Raton: Lewis Publishers, 1995.