

## UNIT II - HOME AND FARMSTEAD PLANNING

### Lesson 3: Livestock Manure Management Systems

**Competency/Objective:** Describe characteristics of disposal systems for managing livestock manure.

#### **Study Questions**

1. What are the principles of a manure management system?
2. What regulatory agencies are involved in manure management?
3. Where can help be obtained for planning a manure management system?

#### **References**

1. *Agricultural Structures (Student Reference)*. University of Missouri-Columbia: Instructional Materials Laboratory, 1999, Unit II.
2. Activity Sheet
  - a) AS 3.1: Resources for Manure Management



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#### TEACHING PROCEDURES

##### B. *Review*

Lesson 1 of this unit discussed various aspects of farmstead planning. This lesson addresses the need for livestock manure management. Handling manure effectively is vital to prevent surface and ground water pollution.

##### C. *Motivation*

Discuss the importance of manure management with the class. Explain that manure accumulates very quickly in confined areas such as feed lots and poultry houses. Point out that livestock manure contains nitrogen and phosphorous that, in large amounts, can seriously damage the environment. Manure, if not properly managed, can easily contaminate water supplies through runoff or leaching through the soil into the groundwater.

##### D. *Assignment*

##### E. *Supervised Study*

##### F. *Discussion*

1. Discuss the principles of manure management systems with students.

#### **What are the principles of a manure management system?**

- a) The main goal of manure management systems is to prevent surface and ground water pollution.
- b) A manure management system generally consists of some form of manure storage and handling.
  - 1) 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 manure is spread throughout the pasture.
  - 2) When animals are kept on lots or in some sort of confinement system, the manure that they produce must be handled efficiently.
    - (a) To avoid pollution
    - (b) To maintain sanitation
    - (c) To make use of the nutrients in the manure for fertilizer
  - 3) Producers have a number of options for managing manure.
    - (a) Depend on the conditions of the livestock operation
    - (b) Common storage options
      - (1) Pits underneath buildings with slotted floors
      - (2) Storage tanks
      - (3) Lagoons
    - (c) Common methods for applying the manure
      - (1) Pumping it through irrigation systems
      - (2) Applying it using some type of mechanical spreader
  - 4) The exact type of manure disposal system needed will be dictated by many factors.
    - (a) Size and type of enterprise
    - (b) Location
    - (c) Costs
    - (d) Local zoning regulations

- (e) Volume
- (f) Odor considerations
- (g) Proximity of neighbors
- (h) Use of manure as fertilizer for crops

2. Ask students to name regulatory agencies involved in manure management. Discuss their activities.

**What regulatory agencies are involved in manure management?**

- a) Department of Natural Resources (DNR)
  - 1) Monitors natural settings
    - (a) Soil and water quality
    - (b) Effect of pollution
  - 2) Enforces regulations
  - 3) Provides information about designing livestock manure systems
- b) Environmental Protection Agency (EPA)
  - 1) Responsible for the enforcement of federal environmental policies and laws
  - 2) Provides information on the laws and rules governing the use of manure

3. A general discussion of the complexities of manure management is needed here to bring to light the fact that one design will not meet the needs of every operation. As a rule, individual systems must be designed to address specific conditions and needs of a given enterprise. Ask students where they would obtain help if they were trying to choose a manure management system for an operation. Discuss the various sources. Have students complete AS 3.1.

**Where can help be obtained for planning a manure management system?**

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

**G. *Other Activities***

Have the students do research and bring to class some recent news articles concerning livestock manure. Discuss the articles with the class.

**H. *Conclusion***

Livestock manure has the potential to be harmful to people and the environment, so proper management is critical to livestock enterprises. Manure management is an enterprise-specific process, and no one system is appropriate for every operation. Help and guidance is readily available from government agencies, livestock associations, and other sources. These resources should be utilized fully.

**I. *Answers to Activity Sheet***

**J. *Answers to Evaluation***

- 1. b
- 2. a

3. Answers may include any two of the following: the local University Extension office, the NRCS office, the National Cattlemen's Beef Association, or a private agricultural engineering firm.
4. Answers may include any three of the following: size and type of enterprise, location, costs, local zoning regulations, volume, odor considerations, proximity of neighbors, and use of manure as fertilizer for crops.
5. Department of Natural Resources and Environmental Protection Agency
6. A manure management system generally consists of some form of manure storage and handling.



EVALUATION

**Circle the letter that corresponds to the best answer.**

1. Which of the following is a resource for information concerning livestock manure management?
  - a. American Society of Engineers
  - b. University Extension services
  - c. Department of Animal Health
  - d. U.S. Society of Veterinary Practitioners
  
2. The greatest threat to the environment from manure is:
  - a. Surface and ground water pollution.
  - b. Air pollution.
  - c. Chlorate toxicity.
  - d. Insect population explosions.

**Complete the following short answer questions.**

3. What are two sources of information that would be helpful in the planning of a manure management system for an independent beef cattle operation consisting of feed lots supporting 500 head of cattle?
  - a.
  - b.
  
4. What are three factors that will affect the type of manure management system chosen?
  - a.
  - b.
  - c.
  
5. What are two government agencies that are involved in regulating manure management?
  - a.
  - b.
  
6. What does a manure management system generally consist of?





Lesson 3: Livestock Manure Management Systems

Name \_

**Resources for Manure Management****Objective:** Develop research skills and locate sources of information concerning manure management.

**Find addresses, telephone numbers, and web sites (if possible) for one of the following sources of information about manure management. These groups help define the regulations affecting manure management and the acceptable types of management systems.**

- Department of Natural Resources *or* Environmental Protection Agency (national and state level)
- Natural Resource Conservation Service (NRCS)
- University Extension (state and local level)
- Professional associations, such as the Cattlemen's Association (national and state level)

**Conduct research into one of these agencies or associations (obtaining materials from them if possible). Prepare a report discussing their duties and the type of information available from the source of information you have chosen.**

