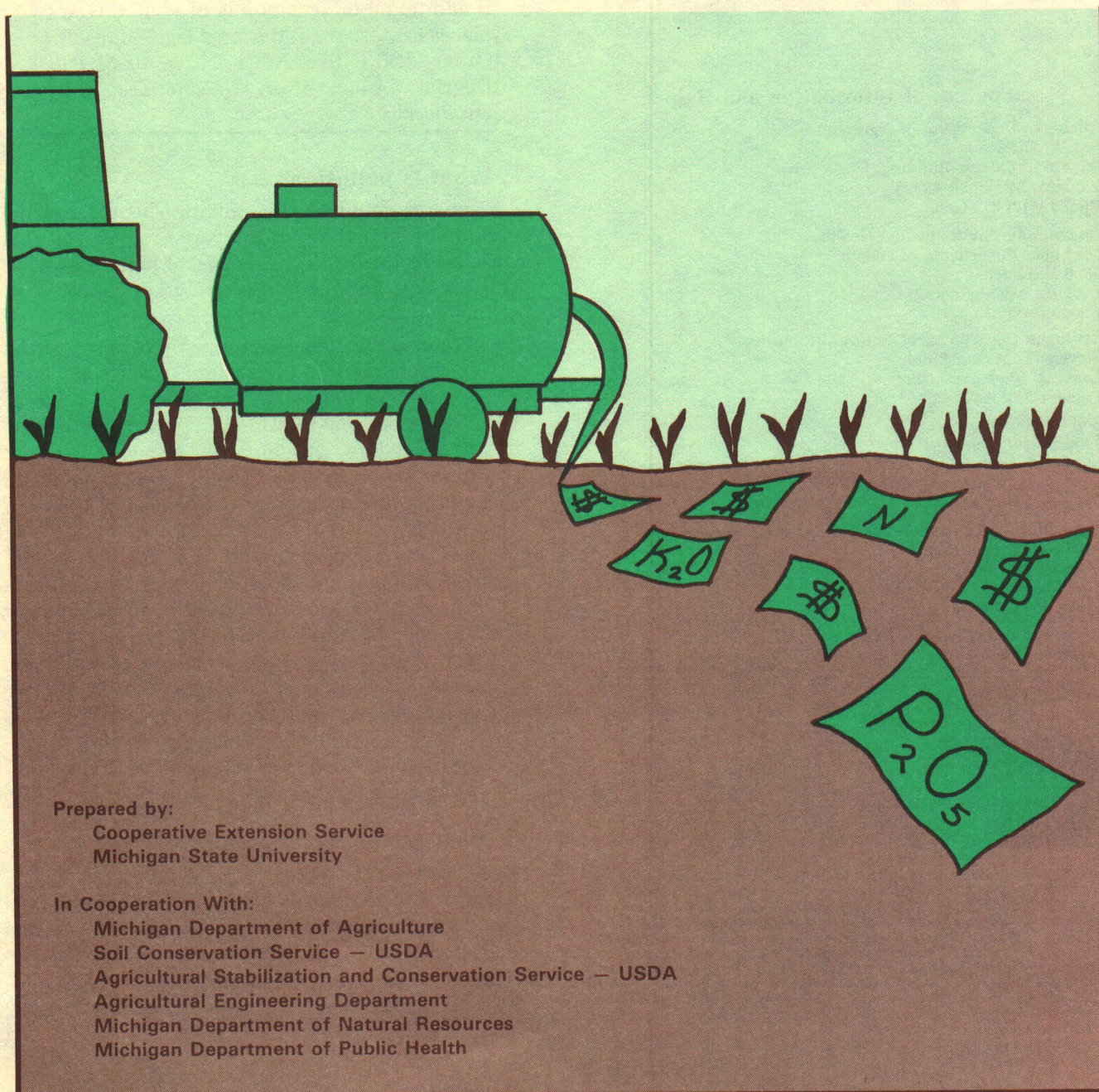


The "Scoop"

ON LIVESTOCK MANURES AS A RESOURCE—REGULATIONS AND RESPONSIBILITIES



Prepared by:
Cooperative Extension Service
Michigan State University

In Cooperation With:
Michigan Department of Agriculture
Soil Conservation Service — USDA
Agricultural Stabilization and Conservation Service — USDA
Agricultural Engineering Department
Michigan Department of Natural Resources
Michigan Department of Public Health

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THE PURPOSE OF THIS PUBLICATION is to provide some answers to questions on the utilization and management of livestock and poultry waste. No single agency or group can answer all the questions that might be asked. There is, however, a cooperative effort among various federal, state and local agencies to provide information and assistance to farm operators in Michigan. The responsibilities of these organizations in areas of enforcement, service and education are explained in the following questions and answers. The term *livestock wastes* in the following questions and answers also includes poultry wastes.

If additional information is needed, the best places to start are at the local level—the CES Office, SCS Office, ASCS Office, or MDNR District Office. Many questions can be answered locally.

1. What is pollution?

A general definition for pollution would be "the addition of something to the water, air or soil that degrades its quality." The degree of pollution varies with the type and amount of pollutant added.

Michigan Law says:

- **Water pollution:** It is unlawful for any person to discharge into the ground or surface waters (directly or indirectly) any substance which is, or may become injurious to, public health, safety or welfare, will impair or prevent the use of those waters by others, is injurious to plant and animal life, or impairs the value and utility of property.
- **Air pollution:** Air pollution is the presence in the outdoor atmosphere of air contaminants (dust, fumes, gas, mist, odor, smoke, vapor or any combination thereof) in such quantities and characteristics and under such conditions, circumstances and duration which are injurious to human life or property, unreasonably interfere with the enjoyment of life and property, and are reasonably detrimental to plant and animal life in this state.

2. What are common pollutants from agriculture?

Animal wastes and related pathogens, animal odors, agricultural chemicals and soil sediment can be major sources of pollution from agriculture. Other sources of pollution include dead animals, fuels, trash, home sewage systems, garbage, heavy metals, inorganic salts, soil particles, smoke and noise.

3. Do all animal wastes cause environmental problems?

No. Animal waste material must get into surface or ground waters, and animal-related odors into the air to cause pollution. Animal waste, when used properly, becomes a valuable resource by supplying plant nutrients when incorporated into the soil.

4. How do animal wastes cause problems in the environment?

The water pollution potential of animal wastes relates primarily to the following four factors:

- a. **Oxygen-consuming organic substances:** These can deplete stream-dissolved oxygen, resulting in injury and death of fish and aquatic life.
- b. **Bacteriological quality:** High levels of coliform and other bacteria can render surface waters unsuitable for contact recreation. They may also affect surface and groundwater supplies consumed by both livestock and people.
- c. **Suspended solids:** These can create excessive turbidity, discoloration and sludge deposits in a stream, affecting recreational, agricultural and other uses and may be injurious to the fish and aquatic life in the stream.
- d. **Nutrients:** The fertilizing effect of such wastes can enrich surface waters to the point of creating nuisance growths of aquatic plants; nitrogen may injuriously affect water supplies. Nitrate nitrogen levels over 10 ppm (parts per million) can render a domestic water supply unsafe.
- e. **Air Quality:** Odor nuisance can be a problem near livestock operations. Many odor problems arise from anaerobic (without oxygen) decomposition of animal wastes. These odors are most intense when manure is transported and applied to the soil surface.

5. Can any animal waste material enter surface or ground waters without causing some problem?

The answer is generally no. Some streams have the ability to assimilate a limited amount of pollution—however, with today's livestock operations, the only practical and positive approach to water pollution control is to protect surface and ground waters from all animal wastes.

6. What state agency determines when unlawful water contamination is taking place?

The Michigan Water Resources Commission (WRC) has statutory responsibility over the control of pollution of surface and underground waters of the state. It is empowered to issue orders to abate

unlawful waste-water discharges. The Commission's orders are enforceable in the courts.

7. What agency is responsible for protecting and maintaining water quality in Michigan?

The Water Resources Commission is empowered to establish water quality standards for waters of the state in relation to the uses to which they are or may be put. The Commission has authority to make regulations and orders restricting the polluting content of any waste material or pollutinal substance discharged or sought to be discharged to any waters of the state. Sec. 5, 7, and 8b—Act 245, Public Acts 1929 as amended.

8. What services are available from the Water Resources Commission to livestock farmers?

The Commission's technical staff is available for consultation and advice on prevention of water pollution problems arising from livestock operations and explanation of specific requirements applicable to a particular operation. (The technical staff are members of the Surface and Groundwater Quality Divisions, Michigan Department of Natural Resources.)

9. What agency is responsible for determining air pollution and maintaining air quality in Michigan?

The Air Quality Division of the Department of Natural Resources (DNR) performs investigative, technical, scientific and other services, with regard to air quality in Michigan. The DNR Air Quality Division is available to provide guidance to farmers who feel they may have a significant air quality problem.

10. How will I know if I am causing a water quality problem?

If you suspect that any of the animal waste from your operation is reaching, directly or indirectly, ground or surface waters, there is reason for concern. Such concern can be addressed by MDNR, SCS or CES.

11. What assistance can livestock farmers expect from the Soil Conservation Service (SCS), USDA, to prevent pollution?

The SCS can assist farmers through one of two programs. Cooperators of any of Michigan's 84 Soil Conservation Districts may receive technical assistance from the SCS. Likewise, any farmer who makes application for cost sharing under the Agricultural Conservation Program (ACP) is also entitled to the same type of assistance. This assistance will include (1) information on soils, (2) preliminary plans for the waste disposal system, (3) assistance

with the presentation of data to the Water Resources Commission, and in many instances (4) construction drawings.

Preliminary studies provide a review of existing or potential pollution problems to develop broad guidelines for more detailed planning and cost estimates of the proposed work.

The presentation of data to the Water Resources Commission utilizes established forms and procedures which have been jointly developed by the SCS and Water Resources Commission to provide early review and response to the farmer's inquiry.

In many instances, the SCS will prepare complete construction drawings and provide necessary assistance for the proper installation of the various system features. For livestock operations requiring extensive engineering, the farmer will only be provided with preliminary studies and cost estimates.

12. What assistance can livestock farmers expect from Agricultural Stabilization and Conservation Service (ASCS), USDA, to prevent environmental problems?

ASCS, through the Agricultural Conservation Program (ACP), will cost-share with farmers for those practices which abate agricultural related pollution of water, land and air for community benefits and the public. To be assured of cost-sharing, farmers must request the practice before it is started and be approved by their local county ASCS committee. Sufficient funds are not available to approve all practices requested and committees have a limited cost-share per person.

13. What assistance can a livestock farmer secure from the Michigan Department of Agriculture?

The Michigan Department of Agriculture (MDA) represents agriculture and consumers in the state government. The Director of Agriculture is a member of the Water Resources Commission, Air Pollution Control Commission and State Soil Conservation Committee. Michigan Department of Agriculture has jurisdiction over pesticide registration and sale, inter-county drains, food inspection and plant protection. Michigan Department of Agriculture cooperates with the USDA and other federal and state agencies which have jurisdiction over pollution control and can assist farmers in their dealings with these agencies. (NOTE: The Michigan Department of Agriculture has jurisdiction also over milk and milk products production and animal health. The department also assists farmers in their dealings with agencies concerned with control of water and air pollution.)

14. Where can a livestock farmer receive information on zoning?

A farmer with questions concerning the zoning of a livestock operation should contact the county or township government office for details about zoning ordinances in the area.

15. What assistance can a livestock farmer get from Michigan State University with regard to livestock wastes?

Michigan State University has two types of assistance for livestock farmers with regard to livestock wastes.

- a. The Cooperative Extension Service can supply educational information and resources to assist in the planning and management of livestock systems, including housing, collection, transport, storage, treatment and use of livestock wastes. It also provides economic evaluations of alternative systems for managing livestock wastes. Standard plans are available for different types and sizes of livestock facilities, including information on soils, breeding management and livestock nutrition. Your county agricultural agent can call on resource people from Michigan State University in the areas of agricultural engineering, crops and soils, agricultural economics, animal sciences and public policy.
- b. New information is being developed through the Agricultural Experiment Station and other research programs. A number of these research projects deal with animal wastes and water quality.

The most direct and closest source of information is the County Agricultural Agent and the County Cooperative Extension Office. Information is also available from various subject matter departments on the M.S.U. Campus.

16. Have agencies of the state established regulations for control of wastes for different types and sizes of livestock operations?

Surface Water Protection Program

The Federal Clean Water Act requires National Pollution Discharge Elimination System (NPDES) permits for the discharge of wastes to surface waters from concentrated animal feeding operations provided that:

1. More than the number of animals specified in Category A, below, are "stabled or confined" and "fed or maintained" for more than 45 days over any 12 month period, and this is done on a lot not used for growing feed ("crops, vegetation forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility"); or
2. More than the number of animals specified in Category B are "stabled or confined" and "fed

or maintained" for more than 45 days in any 12 month period, and this is done on a lot not used for growing feed ("crops, vegetation forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility") and polluted waters are discharged to the waters of the United States through a pipe, conduit, or a man-made ditch; or

3. If the Water Resource Commission (WRC) decides that the discharge needs permitting.

Under the Act, an animal feeding operation is "a lot or facility where the following conditions are met:

1. Animals have been, are, or will be, stabled or confined and fed or maintained for a total of 45 days, or more, in any 12 month period, and
2. Crops, vegetation, forage growth or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility".

A concentrated animal feeding operation is an operation which meets the criteria as shown below:

Category A	Category B	
1,000	300	slaughter and feeder cattle
700	200	mature dairy cattle (whether milked or dry cows)
2,500	750	swine each weighing over 25 kilograms (approx. 55 lbs)
500	150	horses
10,000	3,000	sheep or lambs
55,000	16,500	turkeys
100,000	30,000	laying hens or broilers (if the facility has a continuous overflow watering)
30,000	9,000	laying hens or broilers (if the system has a liquid manure system)
5,000	1,500	ducks

Animal numbers in Category A are equal to an animal unit equivalent of 1,000 and those in Category B are equal to an equivalent of 300. The animal unit equivalent is used to equate different animal types.

Groundwater Protection Program

The Water Resources Commission Act, Act 245, 1929, authorized the Commission to issue a permit for any discharge of waste into the waters of the state. The Act contains language which makes it clear that concentrated animal feeding operations **must** obtain a permit. Regulation 323.2104 declares a concentrated animal feeding operation to be a "point source discharge." Regulation 323.2104 includes agricultural wastes in the definition of "wastes." Regulation 323.2105 requires that "a person discharging wastes

into the surface or groundwaters of the State or on the ground as a point source discharge . . . shall . . . obtain from the Commission a valid national or state permit.

Act 245 does not define what constitutes a concentrated animal feeding operation. P.L. 92-500 defines a "concentrated animal feeding operation" in terms of the number and types of animals confined. However, P.L. 92-500 does not make allowances for the number of acres the animals occupy. This has resulted in too many animals being placed on acreage not large enough to assimilate the waste produced and consequently the groundwater has been polluted in many cases.

Michigan Right to Farm Act

The Michigan Right to Farm Act states that agricultural practices conforming with generally accepted agricultural and management practices shall not be found to be a public or private nuisance.

17. Are there circumstances in which animal wastes greatly increase the potential for environmental problems?

Yes. These situations include:

- High concentrations of livestock or poultry.
- A livestock facility located very close to an open waterway or with a direct slope to a waterway.
- A livestock facility with residences nearby.
- The major expansion of a livestock facility.
- A livestock facility which does not have sufficient land disposal areas.
- The spreading of manure on frozen soil.

18. Should livestock wastes be applied to the land?

Yes. Livestock wastes are rich in nutrients and organic materials, making land and crops the best choice for their utilization. Properly applied, animal waste increases soil fertility, improves soil tilth, and increases water and nutrient holding capacity. This reduces runoff, soil erosion and improves aeration and growth of beneficial soil organisms. However, remember that manure should only be spread at times and locations where it will not wash into streams or waterways.

19. How much livestock waste should be applied to cropland?

Optimal use of nutrients from livestock waste can be achieved by applying the wastes to supply the nutrients required as suggested by soil tests and crop needs. Specific recommendations will depend upon the waste management system in use, crop types and yield goals. However, excessive application of manures to land as a means of disposal is *not* recommended, as this will increase runoff and the leaching of nutrients (which are considered contaminants in water). For further information, contact the

Cooperative Extension Service office in your county.

20. What methods can be used to reduce the land area required for waste application?

Various treatment processes can be used to decompose organic matter and reduce the nutrient content of materials applied to the soil. Such methods include:

1. Aerobic Lagoon:

This process will decompose organic materials to CO₂ and water, leaving a stable, solid residue. This is not practical, however, for livestock wastes because of the large surface area required.

2. Extended mechanical aerations:

Such processes decompose organic material without creating objectionable odors and reduce the nitrogen content of the waste. It does *not*, however, reduce the phosphorous. This method has limited application because it is energy and maintenance intensive.

3. Anaerobic lagoon:

Waste treatment in an anaerobic lagoon decomposes the organic material and reduces the nitrogen and phosphorous content of the waste, thereby minimizing the land area required. However, even with good management, odors are likely to be a problem with this process. It is not recommended as a general practice in Michigan.

4. Composting:

Control of temperature and moisture of material is too critical for satisfactory farm use under Michigan weather conditions.

Any type of lagoon system requires a permit for surface or ground water discharge. Contact the DNR for permit requirements.

21. Whose responsibility is it to make sure that environmental problems do not result from a farming operation?

It is the responsibility of each farm operator, just as it is the responsibility of a processor of products, the management of a manufacturing plant, or the governmental unit of a county or city, to develop the systems and methods of waste handling to prevent pollution from occurring.

22. What should I, as a livestock farm operator, do to minimize odors from my operation?

Good housekeeping and judgement in spreading livestock wastes will contribute most to the prevention of pollution. Buffer strips of grass or trees between a road, drainage way or residences improve appearances and can reduce erosion. Avoid spreading manure on hot, humid days, late in the afternoon or when there is danger of it washing and accumulating in low spots or ditches. Also, make sure site conditions are appropriate for manure spreading practices.

Except in low density grazing situations, livestock should not be permitted access to a flowing stream.

23. What should I, as a livestock farm operator, do to avoid environmental problems if I plan a major expansion or plan to build a new facility?

Site selection and land area for waste disposal are two important considerations. A good plan for the total livestock facility is very desirable. If expansion is being considered, a written statement may be required. Contact state agencies, local government or the Cooperative Extension Service for information.

The Water Resources Statute requires all persons desiring to make a new or substantial increase in use of the surface or ground waters of the state for disposal of waste water to file a written statement with the Commission setting forth the proposal. Sufficient detail should be included to permit the Commission to make a determination as to what, if any, restrictions may be necessary to prevent unlawful pollution. Data as to the type and number of head, site size and location, and a sketch showing the location of residences, drainage ways and streams should be included. Sec 8b—Act 245, Public Acts 1929.

24. Can I, as a farm operator, be sued by a private citizen for pollution?

Yes. Act 127, Public Acts of 1970, permits any person or group to bring an action to the circuit court for declaratory and equitable relief against any other person or legal entity for protection of air, water and other natural resources from pollution, impairment or destruction. The court may grant temporary and permanent equitable relief, or may impose conditions on the defendant that are required to protect the air, water and other natural resources. **Any** operation that pollutes offsite surface waters and/or groundwater is in violation and is **not** operating in accordance with generally acceptable practices.

25. Will every farm be inspected for pollution practices?

No. Inspections are made on a request basis or complaint referral basis by the DNR Water Quality and Air Pollution Control Divisions, County Health Department, or Michigan Department of Agriculture, depending upon the nature of the inquiry.

26. Are there other regulations — local, state or federal — that apply to livestock waste disposal?

There may be. The best sources for this information are your local offices—Cooperative Extension Service, (CES), Soil Conservation Service (SCS), Agricultural Stabilization and Conservation Service (ASCS), Michigan Department of Agriculture (MDA), Michigan Department of Natural Resources (MDNR), and other city and township government offices.