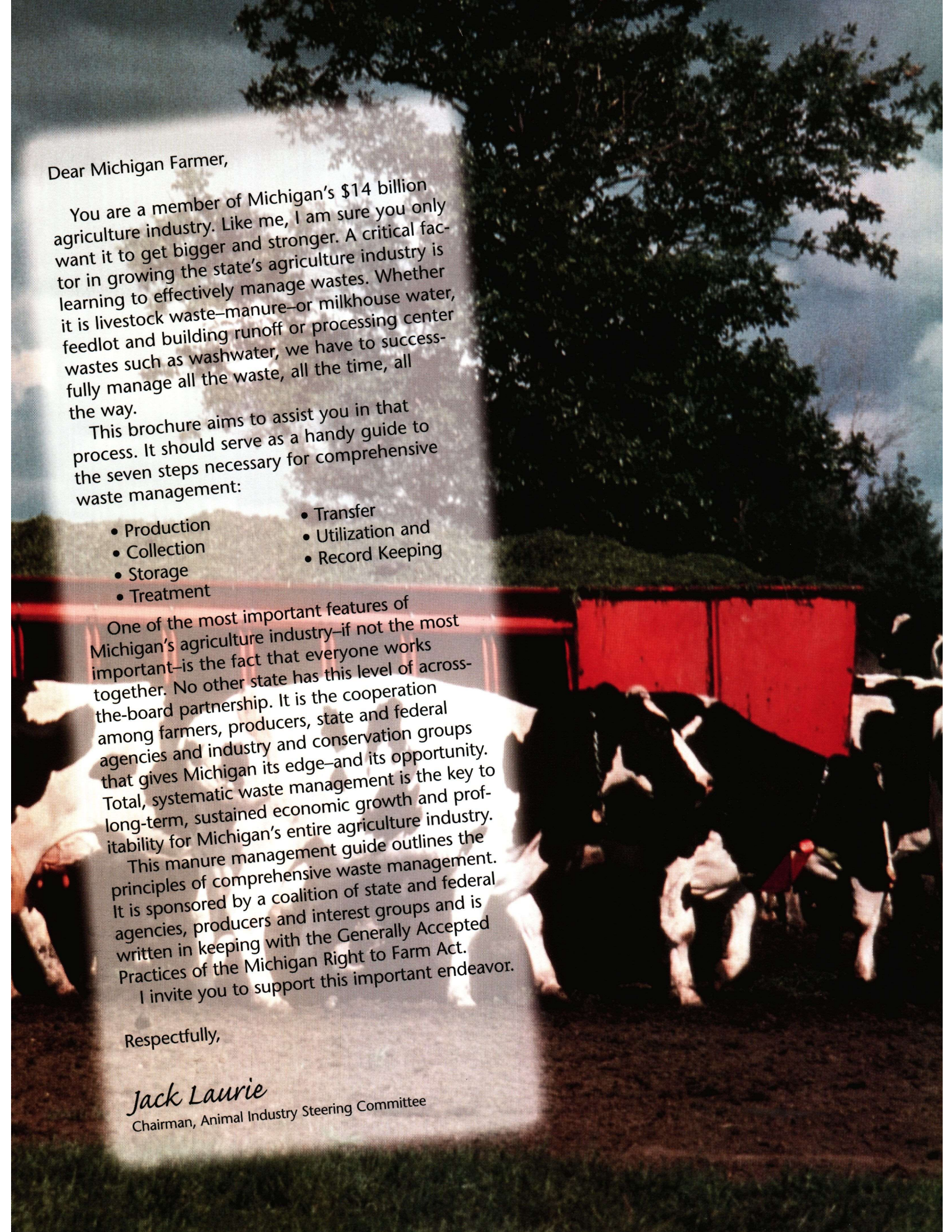


*Your Guide to Managing  
Agricultural Wastes*

**planning  
gets results**

**manure  
management**



Dear Michigan Farmer,

You are a member of Michigan's \$14 billion agriculture industry. Like me, I am sure you only want it to get bigger and stronger. A critical factor in growing the state's agriculture industry is learning to effectively manage wastes. Whether it is livestock waste—manure—or milkhouse water, feedlot and building runoff or processing center wastes such as washwater, we have to successfully manage all the waste, all the time, all the way.

This brochure aims to assist you in that process. It should serve as a handy guide to the seven steps necessary for comprehensive waste management:

- Production
- Collection
- Storage
- Treatment
- Transfer
- Utilization and
- Record Keeping

One of the most important features of Michigan's agriculture industry—if not the most important—is the fact that everyone works together. No other state has this level of across-the-board partnership. It is the cooperation among farmers, producers, state and federal agencies and industry and conservation groups that gives Michigan its edge—and its opportunity. Total, systematic waste management is the key to long-term, sustained economic growth and profitability for Michigan's entire agriculture industry.

This manure management guide outlines the principles of comprehensive waste management. It is sponsored by a coalition of state and federal agencies, producers and interest groups and is written in keeping with the Generally Accepted Practices of the Michigan Right to Farm Act.

I invite you to support this important endeavor.

Respectfully,

*Jack Laurie*

Chairman, Animal Industry Steering Committee

## Step 1: Production

Whether you are dealing with liquid, slurry, a semi-solid or solid waste, it is best to remember the proverb, *Keep the clean water clean*. The amount and nature of waste generated by an agricultural enterprise is its production. Most likely, production will vary seasonally in terms of the kind, consistency, volume and location of the waste. A comprehensive waste management system accommodates all these factors.

If a strategy is developed to separate the “clean water” from the waste, production of unnecessary waste is kept to a minimum. For example, a large part of the waste associated with many livestock operations includes contaminated runoff from open holding areas. Restricting the size of open holding areas, roofing part of the holding area and installing gutters and diversions to direct the clean water away from the waste can reduce contaminated runoff. Management and maintenance of feeders, watering facilities and associated equipment also reduces contaminated runoff.

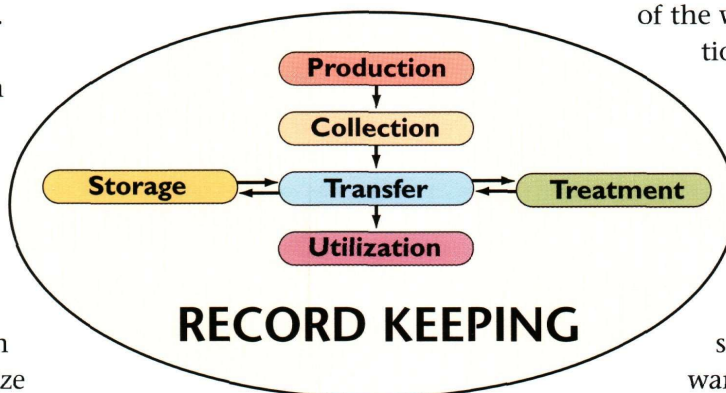


## Step 3: Storage

Storage is the temporary containment of waste. The facility used to store the waste serves as an important tool for the manager for it gives him or her control over the scheduling and timing of each step in a comprehensive waste management system. For example, a manager with adequate storage facilities has the flexibility to schedule the land application of the waste when the spreading operations do not interfere with other necessary tasks, when weather and field conditions are most suitable, and when the nutrients in the waste can best be used by the crop.

It is to your best advantage to develop your utilization schedule first and then “plan backwards” for your storage needs. As you develop this plan, be sure to consider the

length of the storage period, the volume of waste to be stored and the effect of storage on the consistency of the waste. Also plan for the type, estimated size, location and installation costs of the storage facility as well as the management costs associated with the storage process.



## Step 2: Collection

Collection is a critical process that begins with the initial capture and gathering of waste at its point of origin and includes transfer to a designated collection site for treatment, storage or utilization. A comprehensive agricultural waste management system identifies the method of collection, locates the collection points and schedules the actual collections. The system also plans for the labor required to accomplish these tasks, the equipment or structural facilities needed and any installation and management costs associated with the collection activities.

When designing your collection process, be sure to address the effects the process has on the consistency of the waste.

## Step 4: Treatment

Treatment is any step taken to make waste easier to handle or more efficient to use. There are physical, biological and chemical treatments available. Some measures are considered pre-treatment, such as the separation of solids.

When devising your plan, be sure to analyze the characteristics of the waste *before* treatment and determine the desired characteristics of the waste *following* treatment. Carefully select the style, size and location of your facility based on the type and quality of the wastes to be treated and the costs associated with installation and ongoing management. Remember, too, that not all systems require treatment. It is possible to have a successful manure management plan without waste treatment.

## Step 5: Transfer

The transfer process is the movement of wastes—solids, liquids or slurry—from one step in the waste management system to the next. Most systems have three key transfer points:

- transfer of the waste from the collection point to the storage facility,
- transfer of the waste from the storage facility to the treatment facility (if treatment occurs) and
- transfer of the waste from the treatment facility or the storage facility to the utilization site.

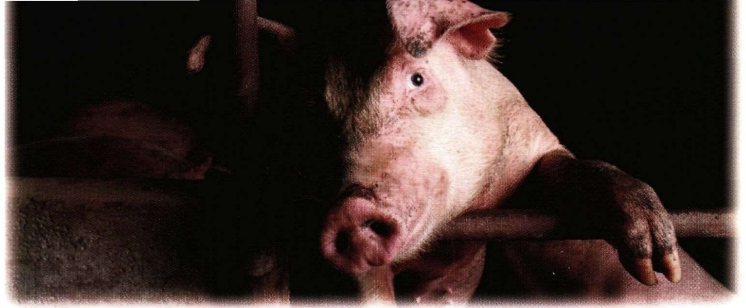
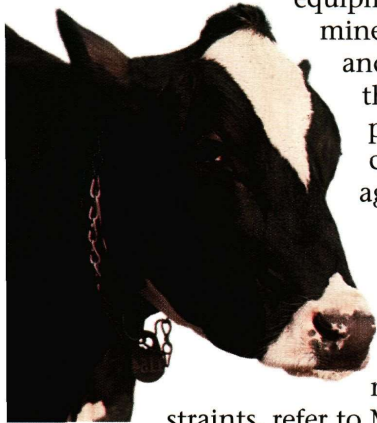
To simplify the transfer process of your waste management system, take the time to analyze all facets of the operation including the consistency of the waste to be moved, the method of transportation, the distance between points, frequency and scheduling, necessary equipment and the costs associated with installation and management of this phase of the operation.

## Step 6: Utilization

When managed properly, waste products are a valuable commodity. The goal of any comprehensive agricultural waste management system is to use wastes for environmental and financial gain.

Wastes make an ideal energy source or may be used as bedding, animal feed, mulch, organic matter or as nutrients for plants. One common practice is to recycle nutrients in waste products through land application. To develop a process for land application, select the fields to be fertilized, schedule applications, design a distribution system, select the equipment you will need and determine appropriate application rates and volumes. Be sure to calculate the overall value of the recycled products as well as the costs associated with installation and management of the utilization process.

Be aware there are four constraints to land application: setback distance, slope, cover (crop residue or ground cover), and soil/nutrient test levels. For more information on these constraints, refer to Michigan's Right to Farm Generally Accepted Agricultural and Management Practices for Manure Management and Utilization.



## Step 7: Record Keeping

Routine record keeping puts the farmer in control of his or her operation. Keep track of the kind, consistency, volume, location and timing of the waste produced. Use this information to develop a comprehensive, cost-effective waste management system for your operation. Consistent record keeping will save you time and money. It also will serve as important documentation of your proper handling of agricultural wastes.

### Points to Consider:

When designing your comprehensive agricultural waste management system, take into account your existing systems and work to integrate waste management into your farm's overall operation. Consider the following:

- Cropping system
- Livestock management system
- Irrigation and drainage system
- Nutrient management system
- Pest management system
- Resource conservation system
- Equipment maintenance and replacement system
- Produce storage, transport and marketing system
- Financial management system

For more information on designing, integrating or implementing a comprehensive agricultural waste management system, contact your local conservation district, USDA service center or county extension agent.

**Planning Ahead Pays: Your Guide to Managing Agricultural Wastes** was developed by R.D. von Bernuth and C. Shaw. It is sponsored by the Michigan Agricultural Environmental Assurance Program with representatives from: Michigan State University, Michigan's animal industries, Michigan Association of Conservation Districts, Michigan Department of Agriculture, Michigan Department of Environmental Quality, Michigan Farm Bureau, Michigan Integrated Food and Farming Systems, Michigan United Conservation Clubs, USDA/Farm Service Agency and the USDA/Natural Resources Conservation Service.

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