Maintenance and Application Records

- Records to be kept by field:
  - Soil test reports
  - Date(s) of manure/wastewater application(s)
  - Source and rate of manure/wastewater applied
  - Date and rate(s) of other nutrients applied
  - Method of application (e.g., surface applied, injected, incorporated, irrigated)
  - Acres used and area of field applied on
  - Weather conditions during application
  - Field conditions during application of manure (wet, dry, frozen, etc.)
  - N-credit from previous year's manure application
  - Previous crops grown and yields
  - Recommended nutrient application rates, including procedures used to determine
  - Plant tissue sampling and testing reports (where applicable)
  - Pre-Sidedress Nitrate Test (PSNT) reports (where applicable)
- Other records:
  - Manure/wastewater quantities produced and nutrient analysis results
  - Inspection and maintenance records
  - Agreements for application of manure/wastewater on land not owned by the producer
  - Record of manure/wastewater sold or given away to other landowners
  - Location of drainage tile vents, streams, etc. with respect to spreading areas

Inputs to Animals

Describe the formulation and management of animal diets Ideally, this should result in:

- Optimum production and/or animal health
- Best economical use of feed materials
- Reduced nutrient excess
- Minimized amount of (excreted) nutrients contained in manure

Alternative Utilization Activities (where applicable)

- Transport and off-site utilization
- Power generation (e.g., methane production, combustion for energy)
- Conversion to value-added products (e.g., compost, energy)

Inspections, Operation & Maintenance, Training

- Schedule used for inspection of structural and vegetative practices and equipment
- Operational and maintenance activities planned
- Schedule for review of animal production management practices/activities by a qualified third party to ensure proper implementation of CNMP
- Specific plans for training farm employees how to follow CNMP, including when training will be provided, such as procedures for:
  - New employees
  - New processes, procedures or equipment
  - Employee responsibilities

Schedule of CNMP Implementation

- Plans for annual review and update of the CNMP
- New components that are planned and the implementation scheduled for each component
- Plan for addressing water quality concerns identified in the plan

Emergency Action Plan

- Actions to take in the event of a spill, discharge or failure of a collection, storage, treatment of transfer component
- Telephone numbers to report and seek assistance in the event of an emergency
- Show anticipated flow paths in the event of a spill, discharge or failure on a site map
- Plan should be readily available to all employees

References and Appendices

- Any publications or sources used for calculations or decisions made in the CNMP. Crop advisors, engineers, and nutritionists, as well as some private business and agricultural agencies, may be certified to assist in writing and developing a CNMP.

About this Publication

This publication was funded by USDA Special Needs, Purdue University, and Michigan State University.

It was adapted in part from the Livestock and Poultry Environmental Stewardship project funded by the U.S. EPA, coordinated by the University of Nebraska-Lincoln, and published by the MidWest Plan Service, 122 Davidson Hall, Iowa State University, Ames, Iowa 50011-3080 and from "Developing a Comprehensive Nutrient Management Plan (CNMP) (published by the Michigan Agriculture Environmental Assurance Porgram, Fall 2001). See <www.lpes.org> or <www.maeap.org> or call (800/562-3618) to obtain access to this and other lessons.

Publications in this series:

- Land Application Records and Sampling
- Emergency Action Planning for Livestock Operations
- Mortality Management
- Inspecting Your Confined Feeding Operation
- Feeding Strategies to Lower N&P in Manure
- Building Good Neighbor Relationships
- Disposal of Farm Medical Wastes
- Manure Nutrient Recycling
- Environmentally Sensitive Field Characteristics
- Manure Applicator Calibration
- Odor Control Options for Confined Feeding
- Comprehensive Nutrient Management Plans

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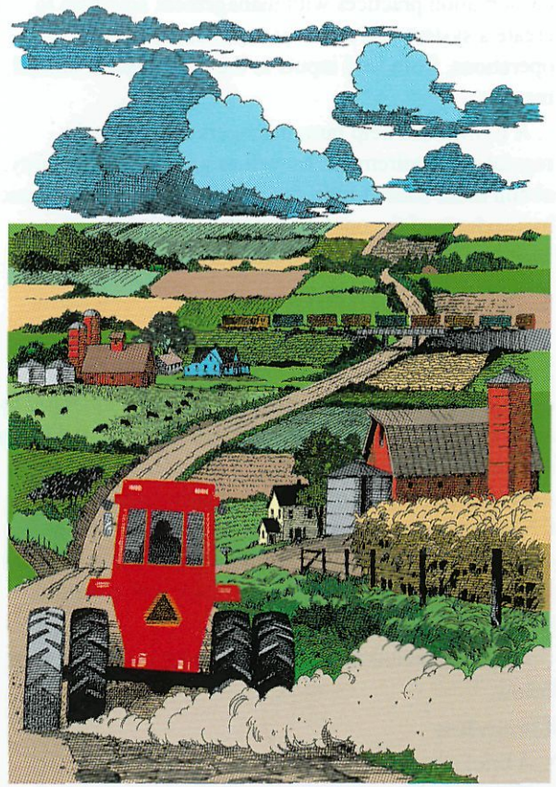
Best Environmental Management Practices

Farm Animal Production

Comprehensive Nutrient Management Plans (CNMP)

Don Jones, Al Sutton, Purdue University, and Charles Gould, Michigan State University



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Farm Animal Production

Comprehensive Nutrient Management Plans (CNMP)

Don Jones, Alan Sutton, Purdue University, and Charles Gould, Michigan State University

What is a CNMP?

A Comprehensive Nutrient Management Plan (CNMP) is a total planning tool that details the animal production related activities for a specific farming operation. A CNMP describes a farm's production practices, as well as the equipment and structure(s) used. It combines conservation practices with management activities to create a system that addresses animal production operations, from feed inputs to the utilization of animal manure.

A CNMP can help farm managers comply with regulatory requirements as well as protect water quality, obtain more benefit from the animal manure and organic by-products of the operation, and minimize negative impacts to the environment and public health.

CNMP Components

A CNMP is a confidential document that allows livestock producers to develop a custom plan for the operation while complying with regulatory guidelines by addressing items such as manure management, field crop nutrients, and storm water runoff in a coordinated manner. Producers evaluate their whole farm through a CNMP, taking a comprehensive look at their entire operation. Producers can confidently make management decisions tailor-made for the operation with a well-documented plan in place.

A CNMP includes a number of components, detailed below.

Overview

- A brief statement describing the overall farm operation, including enterprises, goals, and long-term plans for resource management.

Farm Headquarters Map

A site map showing the location of farm buildings, animal housing, manure storage structures, other sources of manure and wastewater, feed storage, farm house(s) and any other relevant physical features.

Production

- Species, weight, production level, etc. of livestock (herd/flock inventory)
- Amount, location and characteristics of all wastewater generated and any existing water control devices:
  - Manure and wastewater nutrient content and volume
  - Milkhouse and parlor wastewater
  - Water from milk plate coolers/ supplemental cooling systems
  - Runoff from feedlot/barnyard and stored manure areas
  - Leachate from silage storages
- Animal mortalities management - i.e., compost, render, burial, incineration, etc.
- Veterinary waste management
- Volume of stored manure

Manure Collection

- Manure and wastewater collection method(s)
- Location of manure collection points
- Schedule of manure collection
- Equipment and/or structural facilities used for collection

Manure Storage

- Type, location and size (dimensions) of storage facility(s)
- Storage capacity:
  - Volume
  - Storage time available
- Site suitability for storage (existing and planned)
- Method of measuring freeboard, where applicable, for storage

Manure Transfer

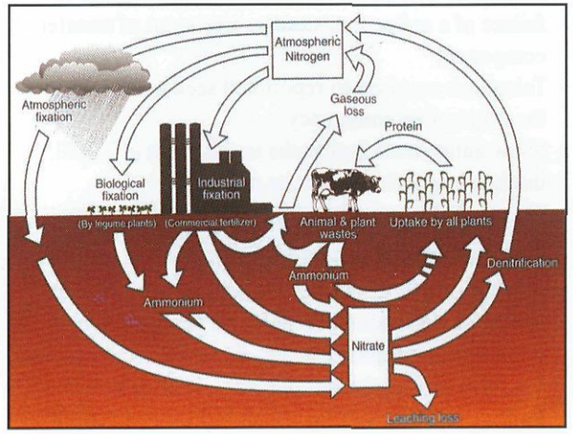
- Method, frequency/schedule, structures, and equipment used for the movement of manure and wastewater between collection, storage, and utilization locations.

Manure Treatment (where applicable)

- Type, function, capacity and location of any treatment facility or equipment

Conservation Practices in Manure Application Areas

- Evaluation of potential for nitrogen or phosphorus transport to surface and/or ground water. Provide a complete description of the following:
  - Soil in application areas
    - Soil hydrologic group
    - Soil management group
    - Percent slope
    - Topography
    - Soil test P value (Bray P1 in lbs/ac)
    - Nitrogen leaching index for soil hydrologic group
  - Water quality issues
    - Location of concentrated runoff flows or surface inlets to tile lines
    - Location of risers and outlets and monitoring outlets during and after manure application
    - Setback requirements from surface water, wells, etc.
    - Divert clean runoff from upslope areas and roof gutters to reduce the volume of contaminated material
  - Surface cover in application areas
    - Residue cover/cover crops
    - Vegetative buffer width available



  - Crop and soil needs for manure nutrient application
    - Manure P application rates
    - Manure N application rates
    - Manure K application rates
    - Manure application method(s)
- Sensitive areas near application areas (sinkholes, streams, water bodies, wells, gullies/swales, tile inlets, drinking water sources, property boundaries, etc.)
- Conservation and management practices used for soil erosion control and drainage to control offsite transport of N, P, and other contaminants
- Maps of each field, showing sensitive areas, setbacks, and locations of specific practices/activities, and the areas where manure will be applied

Land Application Management

- Nutrient budget for nitrogen, phosphorus, and potassium from all sources (include form, source, amount, timing and method of application)
- Calibration procedures for equipment
- Application schedule (estimated dates)
- N, P and K levels in the manure to be applied. Take samples from storage at the time of application, and account for losses due to method of application used.
- Manure application rates, for each field, based on:
  - Crops to be grown
  - Realistic crop yield goals
  - Crop nutrient needs
  - Soil test results (within last three years)
  - Previous year's crops and manure application to estimate N nutrient credits
  - Manure and wastewater nutrient content
  - Is N or P the limiting nutrient
  - Winter spreading may require special provisions to control runoff. Check state requirements for applying manure on frozen or snow-covered areas
- At the time of application, consider field-specific conditions (wet, dry, frozen, etc.) and adjust application rates accordingly
- P build-up or removal, acres of land needed for sustainablility