

3E AGRICULTURAL PRACTICES

This chapter includes information on the role of the CCWMO in addressing water quality issues surrounding agricultural activities, including feedlot management and rural land use practices.

1. ISSUE: FEEDLOT MANAGEMENT

1.1. Issue

Improperly managed feedlots can lead to contamination of surface water and groundwater.

1.2. Background

Animal agriculture, or the production of livestock and associated products, poultry, dairy products, and other agricultural commodities related to the production of animals, is an important part of the history, environment, and economy of Carver County. The ability to continue to efficiently conduct animal agriculture operations in the future is a critical component of a healthy long term agricultural economy in Carver County. Animal agriculture has changed over the years, and will continue to change to adapt to the world in which we live. Over the years changes have tended toward more intensification and concentration of animals resulting in “feedlots”.

A feedlot is an area of land used for the confined feeding, breeding, raising or holding of livestock. An area shall be considered a feedlot if it is a lot or building or combination of lots and buildings intended for the confined feeding, breeding, raising or holding of animals and specifically designed as a confinement area in which manure may accumulate or where the concentration of animals is such that vegetative cover cannot be maintained within the enclosure. Open lots used for the feeding and rearing of poultry (poultry ranges) shall be considered animal feedlots. Pastures shall not be considered animal feedlots for purposes of these regulations

The family farm dairy operation has historically been the “typical feedlot”. Overall, the number of dairy cows remains relatively stable; however, the number of operations is decreasing while the number of dairy cows at each operation is growing. In addition, potential exists for the development of large confinement operations for swine production as well.

The principal concern regarding feedlots is the potential for contamination of surface water and groundwater. Groundwater concerns include leaching of waste into the groundwater, particularly in areas with soils of high permeability; contamination of aquifers through wastes entering unused, unsealed well; contamination of the groundwater by surface water recharge. Surface water concerns include contamination by open lot runoff into a water body, ditch or open tile inlet. Therefore, proper manure management is both a surface water and groundwater issue. Other concerns not directly related to water quality are odor, traffic, and aesthetics.

1.3. Management Tools

Inventory and Assessment

There are 410 feedlots with 10 or more animal units (AUs) in the county (Figure 3E.1). There are feedlots in virtually every jurisdiction in the county with the heaviest concentrations in the central and western townships. This distribution is to be expected as these are the areas with the most active farming operations. The eastern half of the county has fewer feedlots due to urbanization, consolidation of farms, and changing of livestock or dairy operations to cash crop operations.

1.4. Feedlot Management Goal

Goal AG-1 Manage feedlots so that the quality of surface water and groundwater is not impaired

1.5. Feedlot Management Policy

Policy AG-1 All feedlots shall obtain a permit as required by County ordinance and shall be operated and managed according to County ordinance and current best management practices.

1.6. Feedlot Management Implementation

- Imp Strategy AG-1 **Enforcement.** The CCWMO relies on the Carver County Feedlot Program to regulate and enforce feedlots. Carver County Land and Water Services Division is responsible for the implementation of the program, with contributions from the following departments and agencies:
- a. Carver County Environmental Services – is responsible for the overall operation of the County Feedlot Program and enforcement of the feedlot ordinance. The County Environmental Services Director is the Feedlot Administrator.
 - b. Carver SWCD – provides technical assistance to Environmental Services and the operator in the feedlot permitting process. The Carver SWCD evaluates feedlots, performs survey and design work, and works with operators in identifying and resolving problems.
 - c. Carver County Land Management– processes all applications involving buildings or structures; administers the conditional use permit process for large feedlots or feedlots in shoreland zones.
 - d. Carver County Planning and Water Management – provides educational opportunities to feedlot operators.
 - e. NRCS - provides survey and design work and other technical assistance to operators along with the Carver SWCD.
- Imp Strategy AG-2 **Education.** Provide educational opportunities to encourage feedlot operators to operate in accordance with existing regulations.
- Imp Strategy AG-3 **Enforcement.** If needed, prioritize permitting enforcement based on complaints, proposed changes to existing operations (i.e. additional buildings or expansion), location of feedlot relative to sensitive areas, and feedlots located with subwatersheds that are targeted for TMDL implementation.
- Imp Strategy AG-4 **Financial Assistance.** Provide financial assistance and/or incentives to encourage existing feedlot operations to upgrade to meet current standards, as funding allows. Existing financial resources include:
- a. TMDL grant funding;
 - b. State Cost Share Funds; State Revolving Loan Funds;
 - c. BWSR Natural Resources Block Grant;
 - d. NRCS – EQIP (Environmental Quality Incentives Program) ; and
 - e. BWSR Challenge Grants.

2. ISSUE: RURAL LAND USE PRACTICES

2.1. Issue

Proper management of land can help address water quality and water quantity issues within a watershed. Every landowner should be involved in the effort to solve the unique problems within their watershed. There is financial, technical, and educational assistance from various agencies to help landowners implement conservation practices on private and public owned land.

2.2. Background

Almost every human activity including transportation, industrial operations, lawn care, farm management, agricultural activities, land use, flood prevention, waste management, and even recreation, affects the quantity and quality of water within a watershed. Proper management can lessen the impact of these activities on water resources.

2.3. Management Tools

Core-4 Rural Conservation Practices

The Conservation Technology Information Center (CTIC) and its agricultural partners in the private and public sectors are promoting a Core-4 approach to farmers. This approach includes 1) Conservation Tillage; 2) Crop Nutrient Management; 3) Insect, Weed, and Disease Management; and 4) Conservation Buffers. Core-4 benefits both crop production and natural resource conservation. These methods are practical and when planned and applied properly they can:

- Reduce runoff and soil erosion
- Increase infiltration;
- Conserve soil moisture;
- Help keep nutrients and pesticides in-place;
- Improve soil, water, and air quality;
- Increase profitability;
- Reduce risk of potential pollution; and
- Improve fish and wildlife habitat.

Conservation Tillage.

Also known as reduced tillage, mulch tillage, trash farming, and crop residue management. Ridge till, mulch till, and no till are the three basic tillage methods of conservation tillage. Ridge till is a system of planting a crop on ridges. No tillage is done prior to planting. During planting, the ridge top is cleared and the seed planted. The ridges are built and then maintained with cultivation as the crop grows. Mulch till is often referred to as full width tillage. It is a system that uses such implements as a chisel plow or disk to till the entire land area of the crop field. No-till systems leave the soil and crop residues undisturbed with the exception of the crop row area where the seed is placed into the ground.

Crop Nutrient Management.

Crop nutrient management is a process that involves education, planning, and recommendations for the farmer in order to minimize off-site movement of nutrients and pathogens from the field. The first step is to increase the farmer's knowledge of nutrient management. Information including aerial photos, soil maps, soil loss calculations, soil test results, size and kind of operations, type and limitations of equipment, soil and manure sampling and analyses, and current procedures for determining fertilizer needs and application rates are assessed. The next step is to provide assistance to help the farmer implement a nutrient management plan agreed to by all parties and to follow-up with sampling to assess the effects of the plan.

Insect, Weed, and Disease Management.

Insect, weed and disease management is a process that manages agricultural pest infestations including weeds, insects, and disease to reduce adverse effects on plant growth, crop production, and environmental resources. The NRCS has several criteria listed below involving general integrated pest management principles that are options to be considered when managing pests.

- Promote tolerance to pests by providing plants with proper nutrients, water, pH, and soil conditions that favor rapid establishment and vigorous growth.
- Select plant varieties resistant to pests and adapted to growing seasons and hardiness in respective areas of the state.
- Adjust planting dates to optimize plant competition with weeds, minimize insect infestations, and help manage other pest problems.
- Scout fields to properly identify pest conditions and beneficial organism activity.
- Assess pest population levels, including information on stages of development and potential for damage.
- Determine stage of crop growth and plant condition when evaluating the need for timing and effectiveness of post-emergence pest controls.
- Observe other conditions such as fertility problems and soil compaction that may influence need for and type of control.
- Consider economic injury levels and economic treatment thresholds when determining if control is necessary.
- Select appropriate control techniques considering effectiveness, cost, and environmental impact.

Conservation Buffers.

Conservation Buffers are areas or strips of land maintained in permanent vegetation to help control pollutants and manage other environmental problems. Buffer zones have a variety of recognized functions including:

- Reduce impacts from different abutting land uses;
- Stabilize soils, along streams, lakes, and wetlands;
- Prevent erosion;
- Filter suspended solids, nutrients, and harmful or toxic substances;
- Moderate the microclimate of the system;
- Support and protect fish and wildlife habitat and diversity;
- Provide migration corridors; and
- Protect adjacent upland vegetative cover.

Some examples of conservation practices that serve as buffers include filter strips, riparian (streamside) forest buffers, contour buffer strips, field borders, windbreaks and shelter belts, herbaceous wind barriers, cross wind trap strips, and alley cropping systems. Other practices considered include hedgerow plantings, grassed waterways, and streambank protection measures. Waterbody buffer zones are those buffers established for the purpose of protecting water resources. They enhance water quality and aquatic habitat by providing the following:

- Stable ecosystem adjacent to the water's edge;
- Soil/water contact area to facilitate nutrient buffering processes;
- Shade to moderate sunlight;
- Stabilized water temperatures;
- Production of beneficial algal forms and unique vegetation;
- Necessary detritus and large woody debris to the stream ecosystem; and,
- Aesthetic visual appearance.

Other Rural Conservation Practices

Other beneficial practices include rock inlets, and wetland restoration.

Rock Inlets.

Rock inlets are an alternative surface drainage system to surface tile intakes that reduce the amount of sediment entering the tile intake. Surface tile intakes are extensions of the subsurface drainage, in that, a section of the tile is connected to the subsurface and is installed upright to daylight at or slightly above ground level. This system removes surface runoff in much the same manner as a drain in a sink removes water. Rock inlets, on the other hand, remove surface water in a less concentrated manner by allowing some infiltration to occur at the inlet. This is accomplished by removing the upright tile and replacing it with a trench that is filled with pea rock. Runoff can enter the subsurface drainage system through a larger area. Rock inlets reduce the rate of flow and increase the rate at which sediments drop out. Initial research indicates that rock inlets convey approximately half of the sediment that is delivered through standard surface inlets.

Crop producers that have installed rock inlets have been impressed with the function of these systems. This is, in part, to the ease at which field equipment can be used on, near, and around the structures without harm to the equipment or intake. Crops can be planted on top of these structures and tillage equipment can be run through them, or more ideally for longer functional life of these structures, tillage equipment is run over the top. The drainage function of these systems have also been favorable to crop producers. The rock inlets drain more of the subsurface water between runoff events and during winter months. This allows the crops to experience less stress due to saturated conditions. A cost share practice has been established that will cover 75% of installation costs of replacing an open intake with a rock inlet (up to a maximum of \$200 per intake).

Wetland Restoration.

Another rural practice that will help with water quality and water quantity issues is wetland restoration. With over 80 percent of the wetlands drained in the county there is less storage capacity and residence time for stormwater runoff. Strategically identified wetland restoration areas through hydrologic/hydraulic modeling efforts and a wetland inventory will provide additional residence time and storage to both improve water quality to downstream water bodies and reduce flooding impacts. Please see the Wetland Management Chapter of the plan for more information.

Other Rural Conservation Programs.

- *Conservation Reserve Program (CRP)* is a voluntary program that offers annual rental payments and cost-share assistance to establish long term resource-conserving covers on eligible land. Annual rental payments are based on the agriculture rental value of the land and provides cost share assistance in an amount equal to not more than 50% of the participant's costs in establishing approved practices. Contracts last from 10 to 15 years.
- *Conservation Reserve Program (CRP) Continuous Sign-Up* is similar to CRP, but focuses on management flexibility to farmers and ranchers to implement certain high priority conservation practices on eligible land. CRP is competitive bidding, while CRP Continuous Sign-Up is not.
- *Reinvest in Minnesota (RIM)* is a permanent easement on private land. The landowner gives up the right to farm, graze, cut vegetation, and build, but retains ownership, hunting and access rights and pays taxes. Payment rates are based on a percentage of the market price of the land and sign-ups are competitive.
- *Permanent Wetlands Preserve Program* where permanent easements may be acquired by the State
- *U.S. Fish and Wildlife Service Land Acquisition Program* uses two methods of acquisition. The most suitable and permanent habitat is purchased in fee title and the surrounding wetland areas are protected by easement.
- *Conservation Reserve Enhancement Program (CREP)* – This program is a combination of RIM and CRP and it is a permanent easement. A payment of 40% of the RIM payment is made, and then 15 years of CRP payments are made to the landowner.

2.4. Rural Land Use Practices Goal

Goal AG-2 Encourage public and private landowners to implement conservation practices on the land they are responsible for.

2.5. Rural Land Use Practices Policies

Policy AG-2 **Incentive-based Approach.** Utilize an incentive based-approach to encourage the use of conservation practices and other best management practices in agricultural areas.

Policy AG-3 **Project Prioritization.** Focus implementation using TMDL studies and Implementation Plans.

Policy AG-4 **Landowner Assistance.** Provide technical assistance to rural landowners interested in making improvements.

Policy AG-5 **Financial Assistance.** Provide financial assistance and seek grants from other funding sources in order of priority watersheds and for willing landowners. The funding should be used to implement projects on both private and public property and to assist with educational promotions.

2.6. Rural Land Use Practices Implementation

Imp Strategy AG-5 **Partnership.** The CCWMO relies, in large part, on the Carver County SWCD to implement rural land use practices. The CCWMO will work with the Carver SWCD to prioritize education, technical assistance, and funding for rural practices as described in this section. First priority will go toward promoting buffer strips, nutrient management, and rock inlet construction. Second priority will go toward tillage and pest management practices.

Imp Strategy AG-6 **Provide technical assistance to landowners.** As discussed in this section, there is a wealth of knowledge related to water resource practices that landowners can implement. Getting the word out and providing the technical assistance or experts from outside the County to interested landowners is a key to the program's success.

Imp Strategy AG-7 **Seek funding sources and matching grants.** The CCWMO will seek funding sources relevant to education and implementation of private landowner practices that will help improve the water quality and water quantity issues within a watershed. State and federal agencies such as the BWSR, NRCS, USDA, U.S. Fish and Wildlife, MPCA and non-profit agencies such as the Nature Conservancy and Friends of the Minnesota River offer matching funds to a variety of programs that support and encourage private landowner practices that will improve water resources. More and more matching grants encourage partnerships with the private and public sector and a sound watershed management plan. TMDL implementation funding and Clean Water Legacy funding will be important sources of funding.