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Effects of Organic Farming on Water Quality

Reducing the effect of agricultural pollution on Lake Champlain of 0 (Res)Tc 0.2sEm /C2_0 1 4Gh0lt.5 0

- All organically raised animals must have access to the outdoors, including access to pasture for ruminants. They may be temporarily confined only for reasons of health, safety, the animal's stage of production, or to protect soil or water quality.
- Dairy animals must be managed organically for at least 12 months in order for milk or dairy products to be sold, labeled or represented as organic. (Dairy producers may use land that is transitioning during its third year of transition to organic certification to provide crops and forage for dairy animals during this 12 month period prior to the sale of dairy products as organic.)²

How Pollutants Form and Enter Waterways

The major pollutants from dairy farms that affect water quality are nitrogen and phosphorous based. These materials are produced both from fertilizers and from waste produced by livestock. When this waste is exposed to oxygen, nitrates, nitrites, and phosphates are formed. In addition, ammonia is created when nitrogen and hydrogen combine. These organic chemicals are then carried to bodies of water by runoff caused by erosion and rain water.³

As these nutrient levels increase within a water body, excess

Methods for Reducing Agricultural Water Pollution

Reduction through Conventional Farming

According to Laura DiPietro, ARMES Deputy Director at the VT Agency of Agriculture, one of the ways in which conventional farms are managed may help to reduce pollution. In conventional farming, cows are kept "under roof," meaning they are under the shelter of a barn more often than the cows on organic farms. One of the requirements of organic farms is that the livestock remain outside and graze on the land already provided. When cows are under roof, the manure remains in one place and is protected from precipitation events, which enables the farmers to collect the manure and transport it to a single storage unit. It can then be "land applied" at the appropriate time and in appropriate quantities for crop uptake.

The key is to ensure that this manure is land applied appropriately regardless of the type of farming operation, as the risk of nutrient losses to surface water increases when spreading bulk manure at the wrong time. On an organic **Z•**

equally important in reducing outputs. For instance, having a barnyard where animals are temporarily held is common on many small farms, conventional or organic, if uncovered and without proper diversions to collect dirty water, there is a potential that a discharge to surface waters could occur during a precipitation runoff event if a stream is nearby.¹²

A 1993 United Nations Food and Agriculture Organization (UN FAO) report concluded that the following farming practices would be most effective for reducing nitrogen and phosphorous outputs:¹³

- Rational nitrogen application: To avoid over fertilization, the rate of nitrogen fertilizer to be applied needs to be calculated on the basis of the "crop nitrogen balance." This takes into account plant needs and amount of N in the soil.
- Vegetation cover: As far as possible, keep the soil covered with vegetation. This inhibits build up of soluble nitrogen by absorbing mineralized nitrogen and preventing leaching during periods of rain.
- Manage the period between crops: Organic debris produced by harvesting is easily mineralized into leachate.

strip cropping or contour planting (planting hay between rows of other crops also to prevent erosion), crop rotation (alternating crops in different seasons), and vegetated buffers (plants grown to collect farm field runoff).¹⁵

Reduction through State Action

As Vermont attempts to control and reduce agricultural pollution statewide, other actors have enacted methods to regulate pollution of different waterways. The Environmental Protection Agency has initiated a program in order to increase awareness of nutrient management in the states. Since that program began, 25 states have implemented "numeric nutrient standards" for at least one of their water bodies.

Outside the United States, countries have used various control methods to reduce the problem of water contamination from agricultural runoff. "The nature of these measures varies by country; however the United Nations' Food and Agriculture Organization and the Economic Commission for Europe (1991) has summarized the types of voluntary and mandated control as:

- Maximum numbers of animals per hectare based on amount of manure that can be safely applied per hectare of land.
- Maximum quantities of manure that can be applied on the land is fixed, based on the N and P content of the manure.
- Holdings wishing to keep "P" "A"

Regulations¹⁷, as well as The C

