

3.0 PREVENTING WATER POLLUTION

Pesticides, organic animal wastes or inorganic fertilizers used in horticulture operations have the potential to affect water quality in several ways:

- ! they can directly contaminate surface or groundwater through direct spraying or drift;
- ! they can leach from soils into water sources; and/or,
- ! field runoff from sloping or improperly drained areas can carry them into surface water.

Growers must ensure that no production practice has any adverse effects on water quality. This section provides guidelines to reduce the risk of water pollution from horticulture operations. Proper field drainage and farm practices aimed at minimizing the potential for water pollution in greenhouse operations are also discussed.

3.1 Pesticides

You can avoid contaminating water sources during pesticide use by:

- ! never storing pesticides near wells, ditches or bodies of water;
- ! choosing a mixing site away from water sources when outdoors;
- ! only mixing or applying pesticides in still or low wind conditions not stronger than a gentle breeze or no more than 15 kilometres per hour (for example, in the early morning or early evening);
- ! never applying pesticides just before a heavy rain;
- ! leaving a buffer zone when the spraying area is next to sensitive crops or water bodies (30 metres [100 ft] around drinking wells and 30 metres [100 ft] for field boom sprayers along fish-bearing waters);
- ! rinse water that cannot be added to the sprayer tank can be applied to a non-crop area which is on your property and which is at least 200 metres (656 feet) from waterbodies and wells;
- ! using an anti-backflow device on the pump used to fill the sprayer; and,
- ! keeping an air gap between the filler hose and the top of the spray tank.

3.2 Manure

Animal manure from livestock farms or poultry farms is used in some horticulture operations as a source of plant nutrients and soil organic matter. You must ensure that land spreading is performed at proper rates so that water sources are not polluted.

For more information on guidelines for proper manure storage and handling, see the documents, Farm Practices Guidelines for Livestock Producers in Newfoundland and Labrador or Farm Practices Guidelines for Poultry Producers in Newfoundland and Labrador.

Buffer Areas for Manure Spreading

A buffer area is necessary to protect water supplies from contamination during manure spreading. Guidelines exist for both spreading near surface water and sensitive groundwater areas.

Surface Water

It is important to consider the slope of the land in the absence of buffer areas to reduce runoff when spreading manure. As the slope increases, so does the chance that manure may run off. On steeply sloping land (greater than 15%), extra caution must be used when applying manure. It is recommended that the spreading be supervised at all times to ensure that run off is not occurring. Sloping land must be maintained with a reasonable amount of crop cover to provide additional protection against erosion.

A buffer area is necessary to absorb the runoff and prevent it from traveling down a slope, thereby reducing the risk of runoff entering surface waters. The effectiveness of a buffer depends on factors such as land use conditions, vegetation and slope. Good judgment must be used in all cases to ensure runoff cannot enter water sources.

Private Water Supplies

A general guideline for spreading manure is to not spread on land situated less than 75 metres (250 ft) from the source of supply of water used for drinking purposes. When the draining of the land is towards the water supply, a buffer of 75 metres (250 ft) has to be maintained. Consequently, a buffer of less than 75 metres (250 ft) may be acceptable depending on the topography of the area.

Public Water Supplies

Draft guidelines for agricultural operations and associated activities such as manure spreading within protected water supplies do not permit development within the buffer zones as follows:

- ! intake pond/lake: a minimum of 150 metres (500 ft);
- ! river intake: a minimum of 150 metres for a distance of 1 kilometre (0.62 miles) upstream and 100 metres (328 ft) downstream;
- ! main river channel: a minimum of 75 metres (250 ft);
- ! major tributaries/lakes/ponds: a minimum of 50 metres (160 ft); and,
- ! other water bodies: a minimum of 30 metres (100 ft) along and around water bodies.

Buffer zones may be broadened or imposed around sensitive areas such as steep or unstable slopes, bogs, marshes or any other areas as deemed necessary by the Department of Environment. For further interpretation of these guidelines contact the Land Management Specialist, Agrifoods Branch or the Water Resources Officer, Department of Environment.

To protect watercourses (non-water supply), manure must not be spread:

- ! within a distance of 15 metres (50 ft) plus 1.5 times the percentage of the slope; and,
- ! on newly cleared land within 30 metres (100 ft) of a watercourse.

Manure may only be spread on land between 15 and 30 metres (50 and 100 ft) of a watercourse if there is a naturally vegetated buffer within 0 to 15 metres (50 ft) of the water course.

Salmon Rivers

Buffer requirements may be greater along salmon rivers. The Environmental Assessment Act requires all development within 200 metres (660 feet) of a salmon river to be registered under the Act. Farmers must consult with the Department of Environment if contemplating expansion within 200 metres (660 ft) of a salmon river.

Sensitive Groundwater Areas

Both soil and groundwater conditions can be sensitive to agricultural practices which involve the application of either inorganic or organic (manure) fertilizers. Summer-fallowing is another agricultural practice that has the potential to influence surface and groundwater quality. The degree of sensitivity depends on:

- ! the type and depth of the overburden above an aquifer; and,
- ! the type of vegetation at the soil surface.

In order to prevent groundwater pollution during manure spreading, you must be careful to consider the following practices:

- ! care should be taken when spreading manure where the water table in shallow aquifers is near the ground surface;
- ! care should be taken when spreading manure in areas where very permeable soils such as coarse sand or gravel and sand are found at the surface and the water table is close to the surface;
- ! do not spread manure where the overburden above an aquifer is very shallow; and,
- ! care should be taken when spreading manure in areas where shallow bedrock occurs.

Nutrients applied to the soil surface may leach rapidly downward beyond crop rooting depths and eventually reach the aquifer. Since areas with the above noted characteristics tend to be well drained, crop vegetation is often relatively sparse and plant uptake of nutrients is low.

Where such sensitive groundwater conditions exist, manure applications must be avoided or manure must be applied at greatly reduced rates. Consult a professional Agrolgist for site specific recommendations in these sensitive areas before applying manure.

Field Drainage

Horticultural operations in this province must ensure adequate drainage during periods of high precipitation. This is important since soils in Newfoundland and Labrador are generally shallow (approximately 0.5 metres or 20 inches of topsoil), most agriculture areas have a high water table throughout the year and any soil compaction can increase the potential for subsurface drainage problems. Inadequate drainage systems increase the risk of water pollution.

Drainage ditches must be properly maintained and kept free flowing. Properly installed and maintained drainage tiling will help to minimize drainage problems. Ensure that:

- ! drainage is adequate and repair or replace tiles that do not work;
- ! tile outlets are protected to prevent damage to ditchbanks; and,
- ! header tiles are used to reduce the number of outlets entering a ditch to prevent ditch damage and reduce the loss of field areas due to slumping.

Greenhouses

There is the potential for groundwater contamination from greenhouse fertilizers, pesticides, wash-down waters and roof shading cleaning. Several practices will help to reduce the potential for water pollution from your greenhouses. These are:

- 1) **Minimize Leaching.** Plastic sheets or troughs can be used to collect and hold excess water and fertilizer needed by the plant. Fertilizer diluters must be equipped with an anti-siphon valve to prevent fertilizer or pesticides from returning to water sources.
- 2) **Adjustment and Recirculation.** Once collected, the solution is recirculated immediately or held for later recirculation. In both cases, the solution may have to be reconditioned in various ways for re-use.
- 3) **Solution Disposal.** In some instances, reuse will not be possible. This may be due to salt imbalances, end of a crop cycle, disease or contamination. Do not discharge this liquid into tile drains or surface water. You must dispose of this in a sewage disposal system or apply it to land in consultation with advice from crop specialist.

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