

Manure Management to Protect Water Quality

Manure use can provide an economic return to the farmer and be beneficial to the environment. When manure is applied according to crop demand and at the appropriate times, manure can provide some of the nutrients required by many crops. Manure also increases soil organic matter and improves soil structure.

However, manure can be a pollutant if it reaches surface water (such as streams, rivers or lakes) or leaches past the root zone of crops and into shallow groundwater.

Manure in runoff

Runoff carrying manure adds nutrients, organic matter and micro-organisms to surface water. Nutrients promote the growth of unwanted aquatic plants and algae in water.

Oxygen in the water is depleted when algae or aquatic plants die and start to decompose. The lack of oxygen suffocates fish and other aquatic organisms. Also, extremely high ammonia levels in runoff from manure can kill fish.

Decomposing algae can also generate offensive taste and odour problems in drinking water supplies and can increase water treatment costs. Algae can plug intake pipes and pumps, hampering water delivery. Consuming water with toxins from blue-green algae can be fatal to livestock and wildlife and be harmful to people.

Drinking water from dugouts or other surface water supplies must be treated before consumption. Drinking water should be tested every year.

Manure contains fecal coliform bacteria and may contain other disease-causing micro-organisms such as *Cryptosporidium* and *Giardia*. These organisms can harm livestock and decrease productivity.

Runoff from fields where manure was applied in excess of crop demand, runoff from manure stockpiles and cattle with free access to streams and dugouts can contribute to surface water pollution.

Manure management is not just manure spreading.

Protect water resources

Proper manure storage and handling will protect water quality and both human and livestock health while providing nutrients for crop production.

- **Reduce risk of runoff reaching water sources.** Maximize the distance from manure storage areas and livestock to farm wells and surface waters. Restricted livestock access to a water source can help improve water quality. Contain all runoff from manure in catch basins.
- **Control runoff.** Collect runoff from manure piles in holding ponds. Use earthen berms or ditches to prevent up-slope runoff from reaching manure piles.
- **Store liquid and solid manure.** Store liquid manure in earthen storage basins or anaerobic lagoons. Seal earthen storage basins with compacted clay, or in areas with coarse or sandy soils, seal with a plastic liner to prevent leaching to groundwater. Stack solid manure on a concrete pad or compacted clay that drains to a holding pond to prevent leaching to groundwater.

- **Ensure sufficient holding capacity of manure storage area.** A large storage capacity allows the flexibility to apply manure when the soil is dry and work schedules permit. Manure storage should be large enough to store manure, bedding, wasted feed and all liquids for one year. Liquid manure lagoons must have a reserve capacity to hold runoff from large rainstorms to avoid over-topping.
- **Manage manure application rates.** Apply manure at recommended rates according to soil and manure nutrient content for crop demand. Test soil and manure for nutrient content before application: apply according to crop nutrient requirements. Since phosphorus can build up in soils over time, over-application of manure can increase phosphorus levels in runoff and contaminate water. Ensure that an adequate land base is available for spreading.
- **Do not apply manure on frozen, saturated or compacted soils.** Applying manure on frozen, saturated or compacted bare soils increases the risk of contaminated runoff reaching surface water.

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More information

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