

MANURE

farming & healthy fish habitat

Issue 3



A complete nutrient management plan will ensure crop nutrient needs are met over the long-term and will protect the aquatic environment.

The Livestock Manure Pollution Prevention Project develops approaches to reduce manure spills and runoff from livestock operations, in order to protect aquatic habitat and water quality, as well as prevent fish kills.



A RESOURCE ON THE LAND

Over 35,000 livestock farms produce manure in Ontario. This resource may be used profitably in the production of many crops to:

- improve crop yields,
- reduce the potential for runoff and soil erosion by improving soil structure,
- add organic matter that improves the soil's capacity to hold water and nutrients,
- encourage the growth of beneficial soil organisms,
- enhance soil porosity for better aeration and drainage.

The nutrient value of manure may vary greatly and should be determined on a regular basis by chemical analysis. Careful management of manure nutrients can significantly reduce fertilizer costs, putting money in the farmer's pocket.

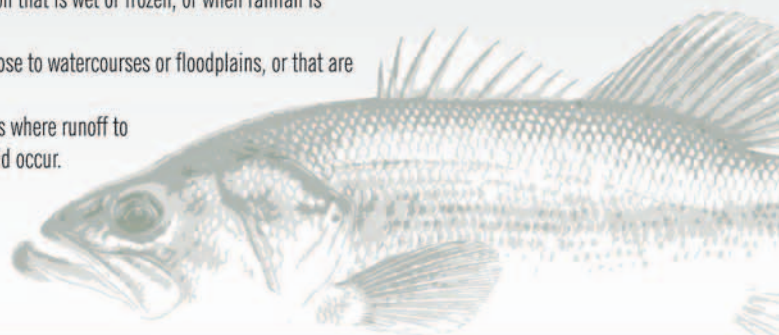
When manure is not properly handled it can result in a spill, polluting surface water and groundwater. Problems may occur during any of the steps of manure management, including collection, transfer, storage and application. If a manure spill reaches a stream it can create serious problems for aquatic life as well as for people and livestock.

Most manure spills are due to:

- manure tanker overflowing during loading,
- over-application with manure irrigation systems,
- overflowing, failed or leaking manure storage,
- improper transportation,
- manure irrigation pipes leaking or being disconnected.

Most spills occur during manure application. To prevent manure from contaminating watercourses, it is important to consider the following:

- pre-cultivate when soil is dry and tiles running,
- apply at low to moderate rates when the land is dry,
- apply at rates that meet the nutrient needs of both crop and soil,
- use leak-proof irrigation connections and shut-off equipment,
- do not apply on soil that is wet or frozen, or when rainfall is forecast,
- avoid locations close to watercourses or floodplains, or that are flood-prone,
- avoid sloped areas where runoff to watercourses could occur.



UTILIZE THE NUTRIENTS!

The Counties of Huron, Middlesex, Oxford, Perth and Waterloo produce enough manure to provide 65% of the nitrogen needed to grow their corn crop. (OMAF 1995)

Apply manure when the crop can best utilize the nutrients.



88 MILLION
LBS REQUIRED



57 MILLION
LBS PRODUCED

This brochure was produced by:
Livestock Manure Pollution Prevention Project,
a sub-committee of the Ontario Farm
Environmental Coalition.

Working Group Members:

Agriculture and Agri-Food Canada
Christian Farmers Federation of Ontario
Dairy Farmers of Ontario
Environment Canada
Fisheries and Oceans Canada
Ministry of Agriculture and Food
Ministry of the Environment
Ministry of Natural Resources
Ontario Cattlemen's Association
Ontario Federation of Agriculture
Ontario Pork
Ontario Soil and Crop Improvement Association
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For more information visit ManureNet at
<http://res2.agr.ca/initiatives/manurenet/>

Printed 2003

ONTARIO ON-FARM RESEARCH

Look for the P3 Ontario On-Farm Research brochure coming soon, with information on current research and demonstration projects, websites and contacts.



Clean water is everyone's responsibility.

DATA

ANALYSIS

The P3 Working Group has been monitoring the data collected from the provincial Spills Action Centre. The data indicates that poor manure management is the leading cause of manure spills in Ontario.

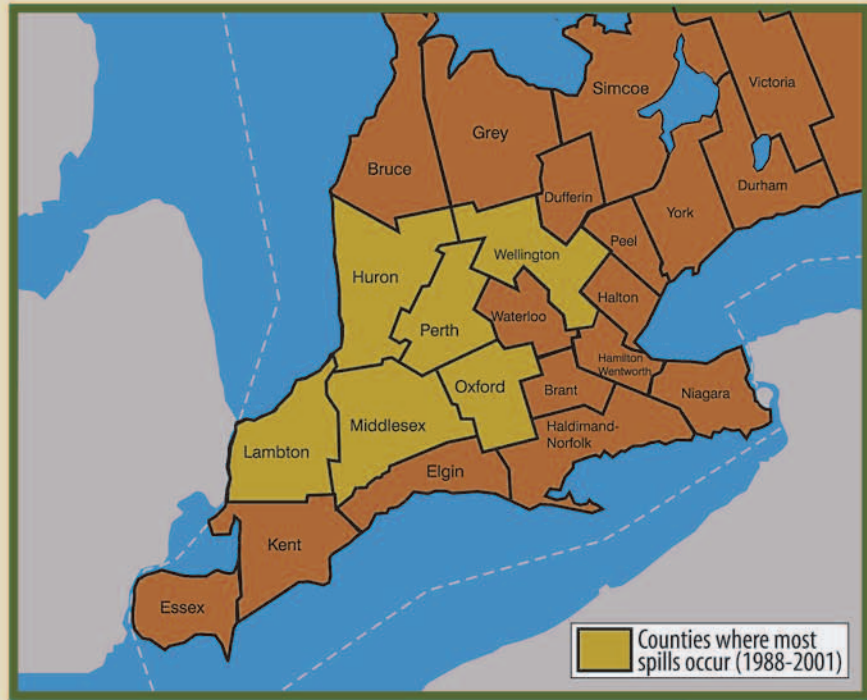
Spills Action Centre: 1-800-268-6060

TRENDS

A total of 278 manure spills were reported in Southwestern Ontario from 1988 to 2001. Of these spills:

- 39% were linked to high level spray irrigation
- 55% involved tile drains
- 18% were observed to result in fish kills
- most spills occurred in April, August or November

An additional 80 spills occurred elsewhere in the Province in the same time period.



MANURE SPILLS DATA FOR SOUTHWESTERN ONTARIO, 1988 TO 2001

Year	Total Spills Reported		Fish Kills Southwestern Ontario	Route to Water			How Spill Occurred			
	Across Ontario	Southwestern Ontario		Field Tile	Overland Runoff	Storage Related	Application by Irrigation	Application by Tanker	Equipment Failure	Transport Related
1988	26	23	6	21	2	1	21	2	2	2
1989	31	19	2	8	4	3	6	1	6	1
1990	35	29	2	22	5	3	15	5	3	2
1991	31	21	1	12	4	2	10	3	5	2
1992	29	22	4	11	6	1	11	2	3	2
1993	19	14	3	9	3	4	4	0	0	0
1994	19	15	2	9	3	3	2	3	4	2
1995	17	15	6	5	3	3	2	0	3	2
1996	24	20	4	7	2	0	3	2	4	3
1997	25	23	7	14	12	10	7	4	0	0
1998	18	13	5	9	4	4	6	2	1	1
1999	21	19	4	5	9	1	5	2	1	0
2000	32	25	0	10	11	2	5	2	2	0
2001	31	20	3	10	11	0	6	5	3	0
Totals	358	278	49*	152	79	37	103	33	37	17

*An additional 17 fish kills occurred outside Southwestern Ontario for a total of 66.

A BUG'S WORLD

Think of a healthy stream as a conveyor belt carrying nutrients. The aquatic plants and animals are able to process limited amounts of these nutrients. If a manure spill occurs, stream life is destroyed and the system shuts down. The excess nutrients build up, affecting water quality.

WHEN MANURE ENTERS A STREAM

- Fish Suffocate - Fish often suffocate when manure enters a watercourse. This occurs because bacteria consume all available oxygen as the manure is broken down. The nutrient-rich manure causes excessive growth of aquatic plants. When algae and plants die and decompose, even more oxygen is used up.

- Poisoning - Manure in a watercourse can temporarily make the water toxic to fish, due to high levels of ammonia. Even at low concentrations, ammonia will kill fish and other aquatic organisms. Manure may also harbour bacteria, parasites and viruses that can harm aquatic life and jeopardize the health of downstream water users.

- Lasting Impact - A large spill may completely destroy all aquatic life. Over time, frequent smaller spills or runoff from barnyards may have an even greater impact on a stream. These types of discharges can change a healthy stream, with a broad diversity of aquatic life, into an unhealthy stream dominated by large populations of only a few organisms.

Streams with poor water quality cannot support most species of fish or the aquatic insects they need for food.

Dragonfly



Damselfly



Dragonfly nymph

Smallmouth Bass



Flying insects emerge from the streambed where they begin their life cycles as nymphs.