

Phosphorus and the Green Scum

Mounds View

50 girls at Pinewood Elementary School 4-5 Grade Summer Math and Science Academy studied water quality for two weeks. Speakers from Rice Creek Watershed District and Minnesota Pollution Control Agency told students that excess phosphorus in water causes green algae scum. The girls canvassed neighborhood causes of water pollution and collected soil samples to test for nutrients. Their findings? Area soils are already high in phosphorus, yet homeowners still add it in fertilizer. So the girls made and handed out leaflets to tell homeowners how to prevent phosphorus pollution.



dissolves easily in water. Yet phosphorus does not dissolve easily. It binds to plants and soils, and in water, it sinks to the bottom. So most phosphorus in water comes from human activities.

What Is the Problem?

Algae Blooms

The element phosphorus is necessary for plants and animals to grow. (DNA and RNA require it, for instance.) Yet too much of this nutrient in lakes or rivers causes explosive algae growth (called “algae blooms”)—also known as, green scum. (The scientific name for such rapid plant growth in a lake is “eutrophication,” which is like the lake getting old too quickly.)

Algae blooms are icky to swim in, and they clog boats and drinking water intakes. They also block light from reaching other plants. Then when algae blooms die, masses of bacteria break them down, using up all the oxygen in the water. When oxygen gets low, fish and other aquatic animals die.

Phosphorus is the “limiting factor” for algae blooms because the other nutrients algae need are already in fresh water. Nitrogen, for example,

Where Does Phosphorus Come From?

- **Too Much Fertilizer** - Fertilizers containing phosphorus and nitrogen help grass, flowers, vegetables, and crops grow strong. Yet some soils already have enough of these elements. When Hennepin Parks tested 181 suburban lawns, all but five had high phosphorus levels. (See Figure 1.) Yet three out of four homeowners fertilized with phosphorus at least twice a year. This shows that most households add phosphorus even though it does no good. When it rains, the extra fertilizer washes into lakes and streams.
- **Leaves and Grass** - Grass clippings and leaves on driveways and streets wash into storm drains and then directly into lakes and streams. There they decay, releasing much phosphorus.
- **Human and Animal Waste** - Animal wastes contain lots of phosphorus as well as bacteria. Manure and pet waste can wash into waterways.

Even after going through a sewage treatment plant, waste water still contains lots of phosphorus.

- **Eroded Soils** - When soil erodes and washes into lakes and streams, it releases phosphorus bound to the soil.

Fig. 1: Fertilizer Study

Phosphorus Level	Number Sites	Phosphorus Fertilizer Application
Low	0	0-1 Applications per Year 25%
Medium	5	2-more Applications per Year 75%
High	55	
Very High	+ 121	
Total Sites Tested	181	

Data in chart is from Hennepin Parks.

Artwork by Hopkins North Junior High 9th Grade Commercial Art Class.

What Can We Do About It?

Test Soil: Report Results

Do a study like the one in Figure 1 on the back of this page. Collect soil samples from a neighborhood—possibly from student homes—using sample bags from the University of Minnesota Soil Testing Laboratory. (See “Mo’ Info.”) Send in bags to find out phosphorus levels. Graph and examine results. Report to homeowners. (See “Educate Others” below.)

Compost

Build bins for leaves and grass clippings, then help homeowners get compost started. Research composting at the library or on the World Wide Web, then create an instruction booklet for your community. Putting compost on gardens keeps away weeds. So it also cuts the need for pesticides.

Educate Others

Organize a campaign to tell homeowners why phosphorus pollution is important. Then explain what they can do to prevent it:

- Compost, mulch, or bag leaves and grass clippings to keep them out of streets and waterways.
- Test soil before fertilizing. Then use phosphorus-free fertilizer.
- Use lawn mowers that chop up grass clippings and leave them on the lawn. These “mulching mowers” also reduce the need for fertilizer.
- Mulch bare dirt before rain compacts its surface. Then plant grass, shrubs, or trees as soon as possible.
- Replace lawns with native grasses and flowers. These plants need less fertilizing and do not need mowing. After a few years, their roots go deep into the soil, so they also help soils absorb rain, which prevents flooding.

“Keep Phosphorus Out Of Our



Mo’ Info.

Step-by-step instructions on how to organize service projects: *Pollution Prevention Project Guide*; Call Minnesota Office of Environmental Assistance for a copy (651) 215-0232. In the *Guide*, see:

- Soil Testing: pages 17-18
- Public Education: pages 8-11

Other Resources:

University of Minnesota Soil Testing Laboratory, 1903 Hendon Ave., St. Paul, MN 55108 (612) 625-3101 <http://soiltest.coafes.umn.edu> Contact for soil testing kit. Includes sample bag and directions. Cost of analysis of each sample is \$7. Allow several weeks.

Minnesota Extension Service: Contact for instructions on how to compost. At their Web site (www.extension.umn.edu) click “Gardening & Horticulture,” then “Yard Waste.”