

Soil Testing

Phosphorus is often the limiting nutrient that controls the growth of algae in lakes. Too much phosphorus, and green, foul-smelling algal blooms can occur. (One pound of phosphorus in a lake can yield 500 pounds of algae.) Grass clippings, leaves, and moderate to high levels of phosphorus in fertilizer are major sources of phosphorus entering local water bodies. Many established lawns do not need additional phosphorus. Youth can help protect water quality by taking soil samples and reporting the results to homeowners. They may also report local soil profiles to the public.

Note that properly applied phosphorus binds to the soil. It becomes a pollutant when carelessly applied onto pavement, through spills, when soil washes away, or when leaves or grass clippings are carried away by runoff.

The University of Minnesota Soil Testing Laboratory tests soil samples for \$7 each and reports the results back. Students can analyze these results and inform the community.



ACTION STEPS

1. Identify study area

- Identify your watershed or sub-watershed. (See page 2 for methods.)
- Ask your city, county, conservation district, or watershed district to what degree phosphorus is a problem for waterbodies in your watershed. (See "Directory" inside back cover.) They may monitor water quality in area lakes.

- Choose sites to sample.
 - School: Select various sites on school property.
 - Student homes: Students collect from their own yards, possibly from neighbors' yards.
 - Random sampling: Take one sample per block throughout an area.
- Plot sites on a map. Discuss whether to add sites to better represent the overall neighborhood or sub-watershed.
- Get prior permission to sample any site. A letter explaining the reason for the tests also helps educate the community.

2. Order kits

- Call your county University of Minnesota Extension office (See "Directory.") for soil sampling kits. Allow a week or more for delivery.
- For more than six kits, call the University of Minnesota Soil Testing Laboratory directly: (612) 625-3101.
- Each kit includes a Soil Sample Bag and detailed instructions.

3. Collect samples

- Read instructions in the kit.
- Youth practice proper collection technique. **Accuracy** is extremely important.
- Make a list of all sample sites. Assign a unique four-digit/letter code to each site.
- Write code numbers on each bag.
- Write other identifying information on each bag, including name of collector and site. (You may want to do this step in the field so samples don't get mixed up.)
- Youth collect samples, bring them to class or group meeting.
 - Each collector needs:
 - Soil Sample Bag, from kit
 - Soil Sample Information Sheet, from kit
 - Each collector needs access to (share if possible):
 - Trowel, spade, sampling tube, or soil auger
 - Bucket in which to mix five separate samplings from each site



4. Submit samples

- Cross check information on bags and code numbers with list of sites.
- Complete Soil Sample Information Sheets together in class. Note: Give your school/organization address under, "Firm Submitting Samples," *unless* you want results and bill sent directly to property owners.
- Submit samples to University of Minnesota Soil Testing Laboratory. (Address is in kit instructions.)
- Enclose \$7 with each. Possible sources of funding include:
 - City, county, conservation district, or watershed district
 - Lake homeowners association
- Allow two weeks or more to get results.

5. Analyze and report results

The Soil Testing Laboratory will evaluate the makeup of the soil and give fertilizer recommendation for each site. Depending on students' understanding and capabilities, chart and plot actual phosphorus levels from results.

- Chart results for all sites. Categorize sites according to amount of phosphorus in soil. (i.e. Low, medium, high, very high.) You may also wish to mark new lawns, since they need more phosphorus than established ones.
- Assign a color to each category. Color sites on map.

- Write a report summarizing your findings. Ask questions such as: What percentage of sites are in each category? Do any patterns appear on the map? Can some areas use fertilizer and others not? Can you explain why? What would happen to lawns if property owners stop fertilizing with phosphorus? To lakes? What time of year will this have the greatest impact?
- Communicate results to property owners and public through articles or fliers. (See "Public Education," pages 8-11.)
- Submit results to local soil and water conservation district and to city.
- Tell how to get the free, laminated "Application Guide for Lawn and Garden Products" from the Department of Agriculture and Minnesota Extension Service. Call (612) 296-1161; fax (612) 297-2271; e-mail Rick.Hansen@state.mn.us Univ. of Minnesota Extension has many excellent publications on low impact lawn care.

An alternate project would be to identify, map, and publicize soil types. Choosing plants appropriate to soil type can eliminate pollution problems such as over-fertilizing and watering. Local agencies likely have much of this information already. "Wonders of Wetlands" includes simple tests students can do to determine if soil is clay, sand, loam, etc. Contact Environmental Concerns Inc. (410) 745-9620 or on the Internet www.wetlands.org/wow.htm