

Sampling lawn and garden soils for analysis



Geoff Siemering, John B. Peters, and Doug Soldat

Why analyze soil?

Soil should be analyzed to determine nutrient levels and fertilizer recommendations, and the presence of elevated lead levels in soil.

Gardening magazines and handbooks and fertilizer product labels make general recommendations for applying fertilizer and other amendments to gardens and lawns. The recommended amounts often are in excess of what is necessary for plant health. Soil nutrient analysis will give you precise scientific information on your soil's ability to supply nutrients to your plants. Since soil analysis is equally useful for telling you what needs to be added and what does not, this knowledge will allow you to develop a tailored plan to maximize potential plant growth and minimize unnecessary costs. You can save money and limit potential water pollution by applying only the nutrients your plants can use.

For people living in housing built prior to 1979 or living near major roadways, soil analysis can also show if yard or garden areas have elevated levels of lead. Lead is naturally occurring in all soils and found at higher levels almost everywhere people live due to its widespread use in paint and gasoline until the early 1980s. Since lead does not move around readily in soil, knowing if parts of your yard or garden have elevated lead levels will help you plan where to garden and how to minimize any possible soil lead exposure to you and your family. UW-Madison Extension publication A4089, *Lead in Home Garden Soil*, discusses soil lead issues more thoroughly, and publication A4088, *Reducing Exposure to Lead in Your Soil*, will help you plan steps to reduce exposure to lead in your soil. Both publications will be helpful if you choose not to analyze for lead, but want to

take precautions. In addition, university or county Extension staff and public health departments can help explain your results.

What will you get with a soil test?

- Soil nutrient content (organic matter, phosphorous and potassium) and pH
- Recommendation of type and amount of fertilizer to add.

When to sample?

You can sample the soil anytime as long as it is not frozen. It is recommended to sample in early spring or late fall to assure that you will have the test results before you need to amend your soil. It generally takes two weeks for the laboratory to complete the soil analysis. It is important to avoid sampling soon after applying fertilizer—this would only tell you how much you just added, not what your soil really needs! Soil nutrient levels do not vary wildly from year to year so checking every three to five years is sufficient.

Since soil lead amounts do not change over time, screening only needs to occur once unless large amounts of soil and compost are added. Adding soil or compost will lower the total amount of lead by diluting it.

Where and How to Sample?

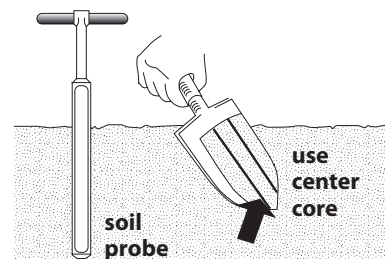
The samples you collect need to be from areas that have been managed similarly in the past or the recommendations will not be correct. In practice this means to sample gardens and lawns separately. If you have lawn areas where the grass grows differently (i.e., front versus back yard) it may be worthwhile to sample each of these areas separately. Soil around homes

can vary. Soil is moved around during construction, and some soil is brought in as fill or topsoil. Because of this, different parts of your yard may have distinct fertilizer needs.

Established gardens and lawns

1. From each area to be sampled separately, remove any overlying mulch, compost or sod. Soil samples should be collected from the top 5-7 inches of soil. Collect approximately one cup of soil with a clean trowel or shovel at four random locations and ten random locations if using a soil probe (see Figure 1).
2. Place the four or ten soil samples collected from a distinct sampling area into a clean plastic container and mix those samples together thoroughly. Samples from different areas should not be mixed together. Remember, the sample should only contain soil and no organic matter (you want to test the soil, not the mulch or sod).
3. One cup of soil from each area to be analyzed should be placed in a heavy-duty plastic or soil sample bag for analysis.
4. Label the bag with your name and contact information and send it to a soil lab.
5. Repeat this procedure for each distinct sampling area or your yard or garden.

FIGURE 1. Sampling tools



New gardens in neighborhoods developed before 1979

If you live in an area developed before 1979 and are starting a new garden please consult UW–Madison Extension publication A4089, *Lead in Home Garden Soil*, for guidance on garden site selection. Studies have shown that high soil lead levels are frequently found in soil next to painted structures (houses, garages, etc.). It is strongly recommended that gardens not be placed within 20 feet of any painted structure built before 1979. UW–Madison Extension publication A4088, *Reducing Exposure to Lead in Your Soil*, details a variety of options you can take if you prefer not to analyze your soil for lead.

Ideally, at each new garden sampling location, samples should be collected at the surface (removing any surface vegetation) and at a depth of 10 inches. This would reveal the extent of contamination through the root depth of most garden plants. In urban areas, frequent soil relocation through landscaping, repurposing of sites and aerial deposition over time has contributed to lead being found up to two feet below the surface. Surface samples alone are not sufficient to determine if a site can be considered hazard free.

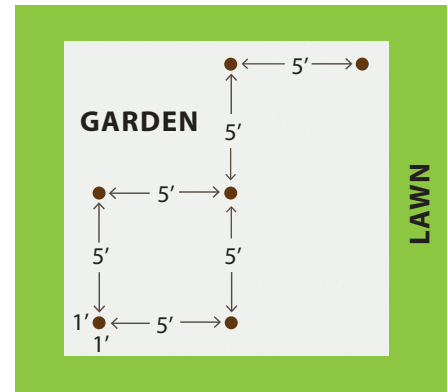
Once you identify where you want to garden;

1. Mark off the borders (using stakes and string for example).
2. Collect samples from a grid of sites starting one foot from the inside corner of your garden and additional samples separated by about five feet in each direction inside the garden (Figure 2).
3. After removing surface vegetation or mulch, collect about one measuring cup of soil from just below the vegetation layer and from 10 inches below the soil surface with a clean trowel or shovel. Place each of these samples into individual clean plastic or soil sampling bags.
4. Label the bags so that you know where in your yard they were collected. Then if the lead levels are high in a particular sample, you will know which part of your yard to avoid when building a garden.

Where can I get my samples analyzed?

The University of Wisconsin has a laboratory available to analyze your soil and will be most convenient for gardeners and homeowners. County Extension offices have contact information for private soil testing laboratories. Outside of Wisconsin, contact your state Extension office for a list of labs.

FIGURE 2. Example Garden Site



Analytical laboratories

The University of Wisconsin Soil and Forage Analysis Lab

4702 University Avenue
Madison, WI 53705

(608) 262-4364

soil-lab@mailplus.wisc.edu

Samples sent to the UW lab will be analyzed for soil nutrients. Lead analysis is available at additional cost.



Extension

UNIVERSITY OF WISCONSIN–MADISON

Copyright © 2024 by the Board of Regents of the University of Wisconsin System doing business as the University of Wisconsin–Madison Division of Extension. All rights reserved.

Authors: Geoff Siemering, Outreach Specialist; John B. Peters, former Director, UW Soil and Forage Analysis Lab; and Doug Soldat, Assoc. Prof., Extension Turfgrass and Urban Soil Specialist, all with the Dept. of Soil Science, UW–Madison. Division of Extension publications are subject to peer review.

University of Wisconsin–Madison Division of Extension, in cooperation with the U.S. Department of Agriculture and Wisconsin counties, publishes this information to further the purpose of the May 8 and June 30, 1914, Acts of Congress. An EEO/AA employer, University of Wisconsin–Madison Division of Extension provides equal opportunities in employment and programming, including Title VI, Title IX, the Americans with Disabilities Act (ADA), and Section 504 of the Rehabilitation Act requirements. For communicative accommodations in languages other than English, please contact oaic@extension.wisc.edu. Persons with disabilities who require alternative means for communication of program information (braille, large print, audiotape, etc.) should contact Heather Lipinski Stelljes at heather.stelljes@wisc.edu.

Visit counties.extension.wisc.edu to find your county Extension office.

Sampling Lawn and Garden Soils for Analysis (A2166)