



*If we understand a soil,
we can improve it*

Why Test Your Soil?

When you look at the soil beneath your feet, you are seeing at a unique mini-universe. Your soil is probably supporting some type of plant life, either something growing because it is naturally suited and adapted to that soil and climate, or a species that developed elsewhere and may not be naturally suited to the local conditions. For the crops we plant, we cannot assume that the soil we have chosen to plant them in is optimally suited to support them. Instead, we must determine the soil's strengths and weaknesses before we can improve it, to ensure our plants have the best opportunity to thrive. The questions we ask as we explore our soil: Does it have good structure that allows passage of air, water, and roots? Does it have enough organic matter to support diverse and healthy microbiological populations? Does it contain the nutrients needed by the plant, and are they available to the plant in sufficient quantities?

Before we can improve a soil, we must first understand it. How do we go about understanding our farm's soil if it is really a mini-universe? Truthfully, we cannot hope to *fully* understand the complex interactions that take place in the soil. But modern soil analysis allows us to know much more about our agricultural soils and to be able to answer the questions that help us maintain fertility by testing for parameters such as organic matter, pH, calcium, magnesium, potassium, phosphorus, iron, boron, copper, zinc, manganese and electrical conductivity.

Most small farmers in the world are very aware of their soil, but do not actually test it. They observe it closely, they care for it, they monitor it after a storm and see whether it absorbed the rain or was eroded by it, they smell it, they walk it thousands of times and as they eat their crops, they are made of it. But without testing, they may be unaware that the soil's productivity is being held back by a deficiency in one or more nutrient. The result: the farmer suffers reduced yields that might be improved with a modest application of locally available organic fertilizer that contains the correct amount of the missing nutrient(s), and the soil becomes more depleted with each harvest. If farmers manage the soil with sustainable closed-loop methods such as GROW BIOINTENSIVE®, the soil can retain added nutrients over time without the need for constant applications of expensive fertilizers, and farms can maintain or even improve soil fertility and yields for many years to come, adding only the nutritionally balanced compost produced from the crops grown on the farm.

What is required to test your soil?

1. *Locate a suitable soil testing laboratory*, hopefully one that is of high quality. Select a local lab, to avoid having to export a soil sample which can require complex permits, and make sure it

provides tests for a wide variety of soil parameters. Suggestions can be found at www.growyoursoil.org/steps, and please contact Grow Your Soil if you need additional help in locating a laboratory.

2. *Take a sample of the soil that is representative of your growing area and reflects the conditions that your plants will encounter as they grow.* To do this, dig a hole 1 foot (30cm) deep, scrape a small amount of soil from the sides of the *entire depth* of that hole (since the top 12 inches (30 cm) has the largest effect on the health of most plants), and put that small sample into a bucket.
3. *Repeat this digging and sampling process* with many holes around your growing area, combining all the small samples into the same bucket.
4. *Mix the bucket of combined samples thoroughly and take one sample from it to send to the soil testing laboratory* you selected. You may want to retain another sample as backup, and you may want to create and submit more than one composite sample if the soils vary greatly on your farm. For more complete instructions, see www.growyoursoil.org/sample.

What if sending your soil to a laboratory is not possible? Another approach to understanding your soil and determining what it needs to support your crops is to observe the crops that it grows for signs of nutrient deficiencies. *Test Your Soil With Plants* (Ecology Action, 2014 http://growbiointensive.org/publications_main.html) is a unique resource for this approach that enables farmers to not only identify nutrient deficiencies but also to develop their own organic fertilizer recommendation to overcome these deficiencies.