

Management Article

Simple Ways To Check The Health Of Your Soil

By Adam Hayes

As humans, many of us try to look after our health and go to the doctor regularly for a check up. Farmers take soil samples from their fields to check the fertility status every three years. Those who have implemented best management practices for their soil often wonder if their efforts are paying off. Good soil management can pay off in more consistent and higher yields. But, how do you know how healthy your soil is?

Cornell University in New York State has developed a Soil Health Assessment and set up a lab to do the analysis. OMAFRA is currently evaluating this for Ontario conditions and commercial viability. However, there are some simple assessments that can be done on-farm by the farmer or an agronomist. Ten easy soil health assessments include - soil structure, soil compaction, soil organic matter, soil colour, soil life, drainage, water-holding capacity, plant growth, root growth and nutrient levels.

Soil Structure

Soil structure is an important indicator of soil health. A well structured soil allows water and roots to move through it easily and facilitates good air exchange. A simple way to check soil structure is to cut a square of soil the width of a shovel and about 15 cm (6 in.) deep. Pick it up and drop it from waist height. If the soil breaks into many small aggregates or particles (about 12 mm or $\frac{1}{2}$ inch or less) then it is well structured. If it doesn't break down much and there are a lot of larger chunks of soil, then it has poor soil structure.

Soil Compaction, Organic Matter & Colour

Detection of soil compaction has been discussed a lot, so it will not be covered here. Soil organic matter can be analyzed from samples that are taken for nutrient analysis. Samples from fence rows or neighbouring woodlots can be used for comparison. Soil colour is a fairly easy visual assessment to do. Soil colour should be relatively uniform across the field. If moisture levels are the same, darker soils will generally have higher organic matter levels. Areas that have experienced erosion or tillage that has mixed in subsoil will usually be lighter in colour.

Soil Life, Drainage, Water Holding Capacity

Soil life plays an important role in organic matter breakdown and nutrient cycling, as well as several other functions. Counting the number of earthworm holes (middens, small piles of soil and residue) found in a square metre is an easy way to estimate soil life. Ten or more per square metre is a good population. The smell of the soil is also an indicator of soil life. A sweet forest smell is good, while a swampy smell indicates a less than ideal situation. Good soil drainage is essential to a healthy soil and for good crop production. The soil has an adequate water holding capacity if the crop does not suffer during moderate dry spells.

Plant Growth, Root Growth, & Soil Nutrients

The crop should be a dark green colour. Growth should be rapid and relatively uniform. Yield maps are a good indicator of differences in crop growth in the field. Crop roots can tell a lot about the soil and crop growth. Carefully dig up the plant roots. There should generally be a uniform distribution of the roots. Roots that take a sudden turn likely encountered a compacted area or a soil texture change. Nutrient levels can be assessed with a standard soil test and can be corrected with nutrient applications.

Basic Soil Health Assessments

It is fairly easy to get some basic assessments of soil health. They can be done any time of the year, although certain times may be easier than others. Adequate soil moisture will make it easier to do some of the assessments. The newly

revised OMAFRA Publication 811, Agronomy Guide for Field Crops, has more information on these assessments and on other aspects of soil management. It is available for purchase, or on the web at www.ontario.ca/crops.