



## Soil Foodweb Oregon, LLC

1750 SW 3rd St Suite K  
Corvallis, Oregon 97333-1796  
Tel: (541) 752-5066 Fax: (541) 752-5142  
info@oregonfoodweb.com

# Assay Descriptions

## Soil Foodweb Assays

Our primary service is microbiology testing, using assays developed by Dr. Elaine Ingham and her staff to analyze the microorganism groups most essential to the health of any soil. These include:

### **TB: Total Bacteria: (total biomass of all bacteria, active or dormant)**

Bacteria promote plant health in many ways. They digest soil nutrients plants cannot, the first step of converting these nutrients into plant available forms. Optimal range varies according to crop, climate and season; if the value is not within this range, bacterial inocula or foods may be required.

### **TF: Total Fungi: (total biomass of all fungi, active or dormant)**

Fungi process nutrients from forms that plants could not access directly. Fungal filaments transport nutrients to where they are most needed. The optimal range of biomass varies according to crop, climate and season. Fungal foods can help increase this biomass if it is too low.

### **AB: Active Bacteria: (total biomass of active bacteria)**

When all the bacteria are dormant, their ecosystem services will not provide the full potential benefit to the plants. When too many are active, they may compete with plants for soil nutrients. The right range of activity varies by season in soils. In mature compost, 10% or lower activity is desired.

### **AF: Active Fungi: (total biomass of active fungi)**

Fungi recover from disturbance more slowly than bacteria. Excessive tilling of soil, excessive turning of compost, or use of many synthetic chemicals can devastate beneficial fungi. Active fungal biomass in the right range is a good sign of overall soil health. If activity is low and the local environment is free of physical and chemical disturbance, the dormant part of the fungal population may only need feeding.

### **Prots: Protozoa: (numbers of individual Flagellates, Amoebae, and Ciliates)**

These single-celled organisms eat bacteria and release plant available nitrogen and other nutrients, making them essential to healthy plant growth. One subgroup, the Ciliates, prefer anaerobic bacteria. A high ciliate population may indicate anaerobic conditions which need to be addressed.

### **Nem: Nematodes: (numbers of individuals and identification to genus and function)**

A very large group of very small worms, found everywhere on Earth. Some soil-dwelling species cause crop damage, some prey on other nematodes, and most graze on bacteria and fungi, boosting natural soil fertility. Diverse nematode activity is a sign of healthy soil, and beneficial to any plant because they cycle nitrogen and other nutrients into plant available form.

### **MC: Mycorrhizal Colonization: (percentage of root sample colonized by beneficial fungi)**

Over 90% of all plants on Earth form symbiotic relationships with mycorrhizal fungi. These fungi increase the nutrient uptake capacity of the plant and protect it against pathogens. They are also sensitive to many toxins in chemical pesticides and inorganic fertilizers, making them a valuable indicator of overall soil health. This assay determines what percentage of the plant's roots are colonized, and can also detect signs of disease and other damage.



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### **QA: Qualitative Assessment: (Bad, Poor, Adequate, Good, Very Good, or Excellent)**

In this fast evaluation, a visual scan of populations determines whether or not bacteria and fungi are present, and provides the approximate range of numbers seen. It can also detect the presence of protozoa and nematodes, although it does not verify their absence if not detected. Does not provide precise counts or calculate biomasses of organisms. It is mainly used to assess the progress of efforts to remedy problems identified in earlier, more thorough testing.

### **E. coli: *Escherichia coli* bacteria: (number of Colony Forming Units detected)**

These common intestinal bacteria have some disease-causing strains, and can indicate other harmful bacteria may be present. We evaluate the number of Colony Forming Units per gram of compost or milliliter of compost tea, to let you know if levels are within or above accepted limits for agricultural fertilizers.

## **General Assays**

### **EC: Electrical Conductivity: (high conductivity indicates high salt levels)**

This test indicates the salinity of soils and composts, to let you know if salt levels are acceptable or potentially harmful.

### **pH: Acidity or Alkalinity: (low pH indicates acidity; high pH indicates alkaline conditions)**

Different crops have different requirements for soil acidity or alkalinity, and the pH is influenced both by the mineral content and the biology in the soil. This test allows us to advise you on how to supplement your soil to correct the pH for best growth of your crops.

### **Leaf Organism Assay:**

This test determines the effective coverage of organisms on the leaf surface, very useful for before and after comparisons of foliar applications of Compost Tea. Adequate coverage of leaf surfaces with beneficial bacteria and fungi helps to reduce disease and pests.