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# Prolific Earth Sciences

## TECHNICAL DATA SHEET

microBIOMETER® Test Kit for determination of soil microbial biomass and fungal to bacterial ratio

### Description:

**Prolific Earth Sciences** has developed a field test that measures microbial biomass for soil, compost, and compost teas/extracts and provides the Fungal to Bacterial Ratio in soils and composts. Microbial biomass (MB) is the acknowledged single best determinant of soil health as levels are indicative of the chemical, biological and structural characteristics of soil that are required for healthy plant growth.

The patented microBIOMETER® test overcomes the biggest problem with measuring soil microbes, separating them from the soil, by means of an extraction solution, whisking and settling procedure. The extracted microbe-filled solution is deposited on a membrane that retains them on the surface. The microbes are pigmented and are quantitated by measuring the light they absorb. The test can differentiate between fungi and bacteria by detecting the slight differences in color of each microbe type. The test only measures active and dormant bacteria and fungi, not dead microbes. Our method has been validated against both a patent applied for digitized microscopy method  $r = 0.96$  and carbon fumigation  $r = 0.94$ .

The results reported for MB are ug microbial biomass carbon/gram of soil. The estimated microbial biomass as determined by microscopy was multiplied by 0.5, which is the generally accepted value, showing 50% of the dry weight of soil microbes is carbon. This method of reporting was selected because it is how the literature generally reports MB. The results also show as a fungal:bacterial ratio, and the estimated percentage of total fungi and total bacteria.



## **Safety:**

The only chemicals in the kit are sodium chloride and calcium chloride in the extraction powder packets. There are no safety hazards associated with these components in these quantities.

## **Starter Kit Components:**

- 10 Extraction Tubes for creating soil solution
- 10 Extraction Powder Packets
- 10 Pipettes for applying extraction solution to Test Card
- 10 Test Cards to capture solution
- 2 Sifters for sifting soil
- 1 Capped Measurer for water
- 1 Soil Syringe for measuring out sifted soil
- 1 Spatula for breaking up dense, clay soils
- 1 Whisker for mixing soil with extraction fluid
- 1 Set of Batteries for whisker
- 1 Magnet for precipitating iron particles in clay soil
- 1 Testing Platform for positioning for Test Card for app imaging
- 1 Box for storing kit supplies with holes for standing tubes during whisking and settling

## **Additional Supplies Needed:**

- Tap Water
- Smartphone

## **Refill Kit Components (10, 50, 100):**

- 10, 50, or 100 Extraction Powder Packets
- 10, 50, or 100 Test Cards
- 1, 5, or 10 Extraction Tubes
- 1, 5, or 10 Pipettes
- 1 Testing Platform

## **Reusable Bundle**

- 10 Extraction Tubes
- 10 Pipettes
- 1 Soil Syringe
- 1 Capped Measurer

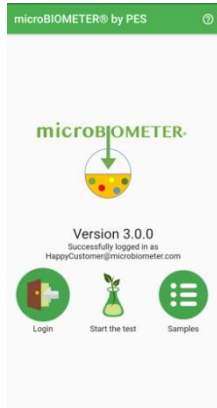
## **Storage:**

Between 40°F and 95°F

## **Disposal:**

Dispose of plastic supplies in accordance with your local ordinance. Extraction fluid and soil should not be disposed of in a sink, may be disposed of in a toilet or other method for disposing of larger waste products.

# microBIOMETER® Soil and Compost Testing Procedure



1

## microBIOMETER® App

Create an account on the app and log in. Click the Start the Test button. Choose which medium you are measuring (soil, container soil, or compost). Click the Start the test from the beginning button.



2

## SIFT SOIL

Sift soil into the plastic bag provided or in a container of your choice. Pick out any large organic matter such as rocks or twigs.



3

## ADD WATER

Fill the capped measuring tube to the top with water and add it to an extraction tube.



4

## ADD EXTRACTION POWDER

Tear open the extraction powder packet and empty the contents into the extraction tube. Whisk for a few seconds, mixing the powder into the solution.



5

## MEASURE SOIL

Fill sampler syringe with sieved soil to 1ml mark. Press your finger against the tip of the syringe and compact the soil to the 0.5ml mark, removing any excess from the tip of the syringe. Add the measured soil into the extraction tube.



6

## MIX SOLUTION

If your soil is very compacted due to a high clay content, use the metal spatula to break up before whisking. Let the whisker rest in the mouth of the tube. No hands are needed. Mix the solution for 30 seconds using the timer provided. The rotating motion of the whisker aids in the extraction process.



7

## SETTLE SOLUTION

Let the extraction tube settle for 5 minutes. After the time has elapsed, tap the bottom of the tube 3-4 times on a hard surface to settle floating debris. Let the extraction tube settle for an additional 15 minutes. Use the timer provided.



8

## SAMPLE SOLUTION

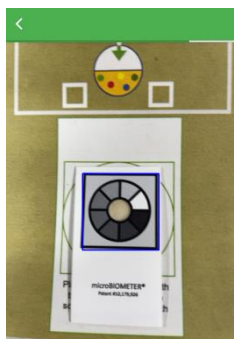
Use a small pipette to draw up solution from about 1 inch below the surface, avoiding any debris.



9

## PLACE DROPS ON TEST CARD

Apply 3 drops of the solution onto the sample window. Allow each drop to completely absorb before adding the next drop. Avoid wetting the printed grayscale surrounding sample window.



10

## ANALYZE WITH THE APP

Center the test card on the white region of the supplied background. Start analysis 2 minutes after applying drops. Align the blue square on the screen with the black square on the sample card. The blue square is a guide – it will turn green when the app is successfully reading the card.