

Prolific Earth Sciences

TECHNICAL DATA SHEET

microBIOMETER® Test Kit for determination of soil microbial biomass and fungal: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. Microbial biomass (MB) 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 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 does not measure dead microbes. The method has been validated against both a patent applied for digitized microscopy method $r = 0.96$ and carbon fumigation $r = 0.82$.

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 average percentage carbon in the dried soil microbial population. This method of reporting was selected because it is how the literature generally reports MB. The results for fungal and bacterial are reported as fungal:bacterial ratio, % fungal, and % bacterial.



Safety:

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

Starter Kit Components:

10 Test tubes

10 Extraction Powder packets

1 x 9.5 ml measuring cup for water

2 Sifters for sifting soil

1 Modified 3 ml syringe for measuring out 0.5 ml of sifted soil

2 Spatula for breaking up clay soils that are dense

1 Whisker, for mixing soil with extraction fluid includes batteries: batteries should be replaced every 6 months or as soon as whisking speed starts to decrease.

10 Pipettes for applying extraction fluid to Test Card

10 Test Card for capture of colored soil microbes

1 Platform for positioning test card for cell phone photo

1 Box for storing kit supplies with holes for standing tubes during whisking and settling

Additional reagents/supplies needed

Clear tap water

Smart phone

Standard Refill Kits

10, 50 or 100 Test tubes

10, 50 or 100 Extraction Powder packets

10, 50 or 100 Pipettes for applying extraction fluid to Test Card

10, 50 or 100 Test Card for capture of colored soil microbes

Plunger replacement for the modified 3 ml syringe for measuring out 0.5 ml of sifted soil

Probe replacement for whisker

Platform for positioning test card for cell phone photo

Storage:

Room Temperature, or between 50F- 95F

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.

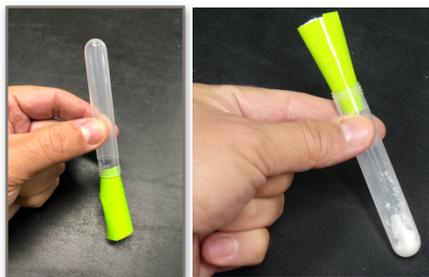
INSTRUCTIONS



1

microBIOMETER® App

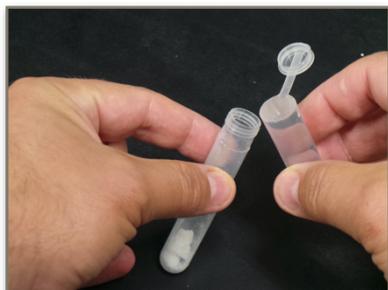
Create an account and log in to save data to the cloud as well as your device. (<https://www.prolificearthcloud.com>)



2

ADD EXTRACTION POWDER

Tear the powder packet open and place the extraction vial upside down on top of the open packet. Invert and tap to empty the contents into the vial.



3

ADD WATER (or compost tea or extract)

Use the small capped measurer to add **9.5 ml** of water or compost tea/extract to the extraction vial.



4

COLLECT SOIL & SIFT

Obtain a composite sample of **MOIST** soil from the top 2 to 5 inches. Using the included sifter, shake to remove debris and collect the sifted soil in the provided plastic bag.



5

MEASURE SOIL

Fill the soil sampler syringe to ~1ml with sifted soil. Compress against your finger to **0.5 ml**, remove any excess from the end, and eject into the extraction vial.

The accuracy of your readings depends on the consistency of the soil volume and compaction.



6

MIX

Compacted soil (especially clay) must be broken up using the included metal spatula. Allow the tube to rest in the hole in the kit, insert the whisker, turn on, and allow to mix for **30 seconds**. You do not need to touch the whisker while mixing.



7

SETTLE

This occurs in **2 stages**. After mixing, allow the liquid to rest for **5 minutes**. Tap the bottom of the tube on a hard surface to coax floating debris to settle. Allow to settle for an additional **15 minutes**. Soil particles will settle to the bottom, creating a microbial suspension above.



8

SAMPLE MICROBES

Use a small pipette to draw up liquid from about half an inch below the surface. Squeeze the pipette before entering to avoid blowing bubbles. Avoid any floating debris and foam at the edges.

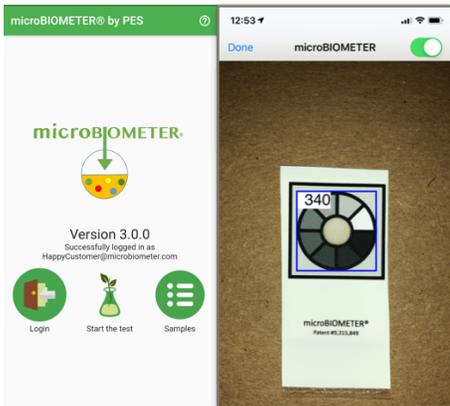


9

PLACE DROPS ON TEST CARD

Carefully apply **3 drops** to the sample window. Allow each drop to soak in fully before applying the next.

Analyze with the app within **2 minutes**.



10

ANALYZE WITH THE APP

Place the testcard on the appropriate spot on the backing card included in the kit. The app will first ask you to name the sample. Then it will automatically image the testcard and provide a reading. Align the blue square on the screen with the square on the testcard. When correct imaging is occurring the blue square turns green. A sample details screen will appear allowing you to enter sample specific information for your records.

Prolific Earth Sciences, Inc. | microBIOMETER.com

Customer Support: 201.732.6677 or info@microbiometer.com