Foothill Biological
Soil Health Services
(530) 648-0694

Sept. 29, 2020

Soil Food Web Assessment

Client: --
Organization: --

Sample ID: compost
Plants present: --
Plants desired: --

Sample received: 9/22/20
Sample observed: 9/24/20
Observed by: Wes Sander

Fungi-bacteria biomass ratio (F:B):
0.01
very low (see p. 3)

Comments: Mostly organic matter, some mineral component. Moisture est. ~35%. Although improvements can still be made, this material offers significant microbial nutrient-cycling capacity (rare among commercially available products). Nutrient cycling is indicated by presence of nematodes and diverse protozoa. The two individual nematodes we observed are morphologically similar (Fig. 1); also, a second count (not recorded here) yielded no nematodes; these factors suggest populations are still limited. Protozoa are likewise still at low numbers, but with high diversity; nearly all flagellates and amoebae observed (Fig. 2) were of unique morphologies. If this material is stored properly, existing predators will help reduce bacterial populations, allowing the existing fungal biomass (Fig. 3) to proliferate. Diversity among bacterial and protozoan communities should produce a healthy range of soluble nutrients.

Organism group	Est. totals/gram St. Dev. (% of mean)	Notes
Bacteria	2,805 µg 756 (27%)	High bacterial count. Populations appear healthy, active, relatively diverse.
Actinobacteria	0.2 µg 0.1 (50%)	Limited presence. Good.
Fungi	26 µg 34 (131%)	Diverse fungi have gained a foothold. Improvement recommended.
Oomycetes	2.3 µg 4 (174%)	Low numbers. Good.
Protozoa	0 -- (--%)	
Flagellates	35,513 29,928 (84%)	Strong numbers, but still limited (see high St. Dev. value). Diversity high.
Amoebae	20,293 15,719 (77%)	(Same as flagellates)
Ciliates	5,073 12,427 (245%)	Estimate derived from single observed individual. Improvement recommended; however, limited presence suggests underlying problems are not significant.
Nematodes	100	
Bacterial-feeding	100	Observed individuals exhibited same morphology, therefore limited diversity
Fungal-feeding	0	Increase recommended
Predatory	0	Increase recommended
Root-feeding	0	Optimal
Microarthropods	0	Increase recommended

Figure 1. "Compost" – Bacteria-feeding nematode, 400x

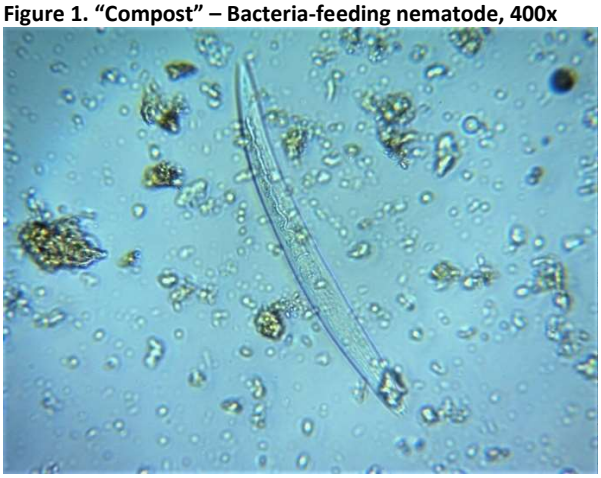


Figure 2. "Compost" – Testate amoeba, 400x

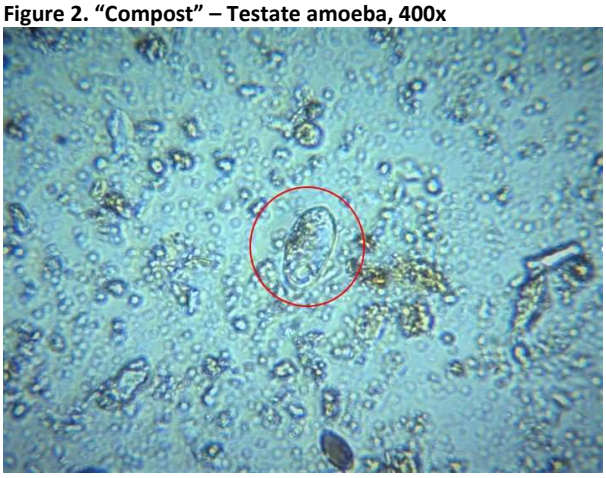
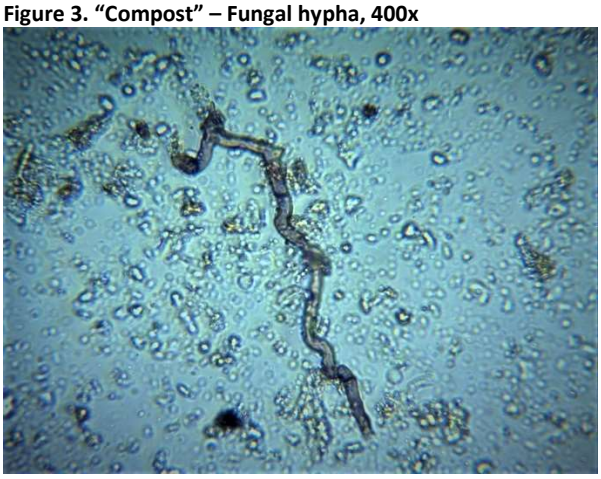


Figure 3. "Compost" – Fungal hypha, 400x



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General Guidelines

Grasses grow best with at least:

- **200** µg beneficial **fungi**/gram soil
- **300** µg **bacteria**/gram soil

Grasses grow best in soil containing a fungal-to-bacterial (F:B) biomass ratio of 0.2-1.0. Shorter grasses thrive at lower F:B values; taller grasses thrive at higher values.

Vegetables grow best with at least:

- 200 µg beneficial **fungi**/gram soil
- 300 µg **bacteria**/gram soil

Vegetables grow best in soil containing a fungal-to-bacterial (F:B) biomass ratio of 0.3-0.8.

Trees grow best with at least:

- 1,000 µg **fungi**/gram soil
- 200 µg **bacteria**/gram soil

Trees grow best in soil containing a F:B ratio of at least 5. **Deciduous** trees grow well in a wide range of F:B ratios, between 5 and 100. Most **conifers** typically favor much higher F:B ratios.

Protozoa numbers should always be at a minimum of 100,000 active individuals/gram soil.

Beneficial nematodes should total at least 100 active individuals/per gram soil.

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If a **Standard Deviation** value equals or exceeds its associated population count, that count could be much lower (or much higher) than the value we observed. We employ reasonable methods to reduce the standard deviation, thereby increasing accuracy. However, a high SD value generally reflects low organisms numbers – because, as a population shrinks, its members show up in statistical surveys with decreasing consistency.