

COMPOSTING SERIES



Determination of Compost Maturity

Composting is complex process which involves several cycles such as carbon or nitrogen production. Carbon and nitrogen production is directly affected by how much microbial activity there is in the compost pile. The best time for compost to be used for plant growth and development is once it is mature. A compost is considered mature once it moves from a phase of high microbial activity to a phase of low microbial activity. During this maturity phase most, organic materials will have broken down to useful humus and also carbon and nitrogen production will have been reduced.

Why is compost maturity important?

- Immature compost, can cause phytotoxicity to plants
- Low aeration needs
- Raw materials have broken down
- Low aeration
- Better consistency and smaller particle size

Methods for Evaluating Compost Maturity

Method	How does it work?	Considerations
Chemical Methods	Measures chemical changes in the compost such as; Cation Exchange Capacity (CEC), Carbon and Nitrogen Ratio (C/N Ratio), Nitrification, or pH	May require field equipment that is capable of measuring these parameters or access to laboratory testing services.
Biological Methods	Measures the phytotoxicity of a compost by determining if germination is affected by the compost	Can be done in a household setting, however it may use up valuable seeds.
Microbiological Methods	Measures microbial activity; Immature compost=Microbial activity is high Mature compost=Microbial activity is low	Uses indicators such as; CO ₂ and NH ₃ production or Biological Oxygen Demand (BOD). May need laboratory services however household tests are available (Ex: Solvita Compost Maturity Test)
Spectroscopic Methods	Measures the ability of light to refract through compost samples in order to measure how much humus may be in the compost pile	Does not destroy sample when analyzing, however, there is a need of complex spectroscopic equipment
Degree of Humification	Measures the degree to which organic matter has degraded into humus, which is easily used by plants	Several ways of measuring mathematically, but needs certain measurements such as acid contents or carbon content which need to be measured in a laboratory
Chromatographic	Measures biosynthesis of acid in order to measure indirectly degradation of large compounds in the compost	Need of complex equipment and expertise in how to use them
Physical Methods	Measures physical aspects of the compost such as; temperature, appearance, color, uniformity and odor	Does not need expensive equipment, however, these characteristics can be very subjective and therefore not good indicators at times. Temperature can be very reliable because it is measured, but it must done properly with a compost thermometer.

Solvita Compost Maturity Test:

This easy-to-use maturity test uses microbiological methods but removes the need for laboratory services. Throughout the composting process different microorganisms work at degrading large materials into smaller materials. In the process depending on what type of microorganisms are present, they will increase or reduce the production of two gases: CO₂ and NH₃. Once

microbial activity is low (compost is mature) these two gasses will be reduced. The Solvita test contains two pallets, one measures CO₂ and the other measures NH₃. This is done by taking a small sample of compost, placing it in the provided container along with the two pallets. Then the container is sealed and after one hour the colors that appear in each pallet are compared to a maturity index provided with the kit and the stage of the compost is determined.



Determination of compost maturity using Solvita test kits.

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