TechLink Research Summary #3336

Understanding and Identifying Compost Filter Media used in Compost Filter Socks

What is Compost?

Compost is the product resulting from the controlled aerobic, microbiological decomposition process of organic materials that have undergone mesophillic and thermophillic temperature phases, that sanitize and stabilize the recycled organic materials to the point that it is beneficial to plant growth. Compost bears little physical resemblance to the raw material from which it originated. Compost is a carbon and biologically based source of organic matter that has the unique ability to improve the chemical, physical, and biological characteristics of soils or growing media. It contains plant nutrients but is typically not characterized as a fertilizer (US Composting Council 2008; Risse and Faucette, 2000).

Most federal and state agencies require compost to meet the 40 Code of the Federal Register (CFR), Part 503, Appendix B, Process to Further Reduce Pathogens (PFRP) to ensure safe use. This states that compost must undergo either the in-vessel composting method or the static aerated pile composting method, and maintain temperatures over 131 degrees F for 3 consecutive days; or use the windrow composting method and maintain temperatures over 131 degrees F for 15 consecutive days with a minimum of 5 turnings of the windrow.

How is Compost Produced?

Compost is produced through the controlled activity of aerobic (oxygen- requiring) microorganisms. These microbes require oxygen, moisture, and food in order to grow and multiply. When these factors are maintained at optimal levels, the natural decomposition process is greatly accelerated. The microbes generate heat, water vapor, and carbon dioxide as they transform raw organic materials (waste) into a stable soil conditioner (compost). Active composting is typically characterized by a high-temperature phase (thermophilic) that sanitizes the product by killing weed seeds, plant and human pathogens, and allows a high rate of decomposition; followed by a lower-temperature phase (mesophilic) that allows the product to stabilize while still decomposing at a lower rate. Compost can be produced from many "feedstocks" (the raw organic materials, such as leaves, manures or food scraps). State and federal regulations exist to ensure that only safe and environmentally beneficial composts are marketed.

Why use Compost?

Organic materials that have undergone the composting process typically exhibit many benefits including, but not limited to: weed seed destruction, plant and human pathogen destruction, degradation of toxic materials, methane gas prevention, neutral pH suitable for plant growth, carbon to nitrogen ratio suitable for plant growth, stabilization of nutrients, stabilization of carbon, carbon sequestration, beneficial microorganisms, sorption of pollutants in soil and/or water, biofiltration of pollutants in runoff, soil erosion control, plant disease suppression, water absorption, and water conservation.

What is Compost Filter Media?

Compost filter media is organic material that has undergone the composting process and has had the small particles removed through a screening process. The large particles, often termed "overs", are the material used and described as compost filter media. This screening process is required to meet applicable federal and state particle size distribution specifications, typically 99% < 2 inch, 60 > 3/8 inch (although this may vary slightly from state to state).

Federal and State Specification Requirements

At the current time 6 federal agencies and most state environmental protection agencies and/or state departments of transportation have a standard specification or required guidelines for compost filter media applications. While these vary substantially in their level of detail and requirements, most include parameters for 40 CFR Part 503 PFRP compliance, and content ranges or threshold levels for heavy metals, pH, organic matter, moisture, soluble salt, biological stability, maturity, human made physical inerts, toxic materials, particle size distribution, pathogens, and physical appearance (Archuleta and Faucette, 2011).

References:

Archuleta, R. and B. Faucette. 2011. Utilization of Compost Filter Socks. US Department of Agriculture, Natural Resource Conservation Service. Technical Note No. 4.

USCC Fact Sheet: Compost and its Benefits. 2008. United States Composting Council.

Risse, M. and B. Faucette. 2000. Food Waste Composting: Institutional and Industrial Applications. Department of Biological and Agricultural Engineering, The University of Georgia. Bulletin 1189.