TechLink Research Summary #3309

# Humus Content and Quality of Compost Materials

Humus is the stable organic fraction of soil, compost, or any growing media. Humus is the term used for a collection of complex organic compounds that have been decomposed and synthesized by microorganisms to a stable level - or are resistant to further decay or decomposition (Brady and Weil, 1996). Humus is generally dark brown in color, colloidal in nature, and mostly organic carbon - as most nutrients have been mineralized and subsequently made available to plants by microbial decomposition. The benefit of this humus fraction is its ability to increase the physical structure and stability of the soil, to hold nutrients and make them available to plants, to hold water (5 times its weight) and to make it available for plants, and to adsorb pollutants in the soil and water matrix (Brady and Weil, 1996).

Composting is often referred to as an accelerated humification process. Approximately 15 to 35% of the carbon originally used to make compost ends up as humus and approximately 60 to 80% of the stable organic matter content in compost or soil is in the form of a humic substance.

Humic substances are made of humins + humic acids + fulvic acids, while the remaining non-humic fraction, 20 to 40%, is still considered humus and of great benefit to nutrient availability for plants and to aggregate stability (which increases water infiltration, percolation and holding capacity; increases soil biology and reduces soil erosion) of soil particles. Humic substances can be extremely stable with a half life ranging from decades to centuries (Brady and Weil, 1996). Humic acid and fulvic acid is known to enhance seed germination, root establishment and root elongation; however, scientific tests of commercially available humate products have not shown any benefit to plant growth (Brady and Weil, 1996). It is the naturally produced humus fraction of compost that is generally considered to be its most beneficial and valuable component.

Reference:
Brady and Weil, 1996. The Nature and Properties of Soils, 11th Edition. Prentice Hall, Inc, Simon and Shuster Co., New Jersey.

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