Composting Ingredients

Municipal Yard Waste Composting Operator's Fact Sheet #2 of 10

Tom Richard
Cornell Cooperative Extension
Cornell University

Yard waste consists of a variety of different materials, each of which has its own characteristics and requirements. When combining different materials such as leaves and grass clippings to make compost, the concept of carbon to nitrogen ratios (C:N) is critical. The ideal proportion of these two elements is about 30 parts carbon to 1 part nitrogen by weight, although this ratio may need to be adjusted based on the bioavailability of carbon and nitrogen.

If carbon and nitrogen are too far out of balance, the microbial system will suffer. When there is little nitrogen, the microbial population will not grow to its optimum size, and composting will slow down. In contrast, too much nitrogen allows rapid microbial growth and accelerates decomposition, but this can create serious odor problems as oxygen is used up and anaerobic conditions occur. In addition, some of this excess nitrogen will be given off as ammonia gas that generates odors while allowing valuable nitrogen to escape. Therefore, materials with a high nitrogen content, such as grass clippings, require more careful management, with adequate aeration or frequent turning as well as thorough blending with a high carbon waste.

Waste materials can be blended to improve the carbon-nitrogen balance and hasten decomposition. For example, leaves are typically in a ratio of 40-80 units of carbons to 1 unit of nitrogen. Although leaves will compost slowly by themselves, they can benefit from additional nitrogen. Mixing leaves with a high nitrogen waste, such as grass clippings, manure, or nitrogen fertilizer will accelerate the decomposition process. Adding one part grass clippings to three parts leaves, or two pounds of nitrogen fertilizer to a cubic yard of leaves, will balance these nutrients and help composting proceed in the shortest possible time. The table below presents estimates of the C:N ratios of various compostable materials.

Carbon to Nitrogen Ratios

High Nitrogen Materials:	**C:N**
Grass Clippings	19:1
Sewage Sludge (digested)	16:1
Food Wastes	15:1
Cow Manure	20:1
Horse Manure	25:1
High Carbon Materials:	
Leaves and Foliage	40-80:1
Bark	100-130:1
Paper	170:1
Wood and Sawdust	300-700:1

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Dept of Soil and Crop Sciences
Bradfield Hall, Cornell University
Ithaca, NY 14853-5601
cwmi@cornell.edu