Composting: Some Basic Requirements

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Given large amounts of trash we generate every year (1.6 million tons in 2009 for O'ahu, about one fourth of which was green waste), and limited land-fill facilities, we as concerned citizens should do something about our garbage. One of environmentally friendly ways is to make compost out of these discarded materials, particularly of green waste.

Figure 1. Green waste

In composting, the first step is sorting to separate plastic, metal, and glass from biomaterials, such as grass clipping or tree trimming. The latter will then go through a grinder to reduce their size to approximately 1 – 3 inch pieces, so that microbes can easily "work" on them. In fact, composting is a controlled process based on the biological decomposition of organic residues into partially humified materials. During composting the temperature of the compost pile would increase to around 55 – 65 °C (130 – 150 °F). Such elevated temperatures help kill most pathogens and weed seeds.

Since composting relies on microbial activities, temperature, moisture, pH and nutrients should be controlled and optimized. It is recommended that the initial ambient temperature be between 10 and 25 °C (not a problem in our state), moisture of the pile be around 40 – 60%, O_2 be 10% or more (frequent turning may be needed), pH ~ 7 - 8, and the initial carbon-to-nitrogen (C/N) ratio of the feed stock be between 20 and 40. It is not uncommon that feed stock for composting can vary widely in terms of C and N contents. For example, animal manure or grass clipping may have rather high N (3-5%) and low C (< 40%), yielding a C/N ratio of less than 15. On the other hand, saw dust, wood chips or tree trimmings may have less than 1% N, giving a C/N ratio as high as 200. So, when making compost, these materials should be mixed together, if possible, such that a C/N ratio of 20 – 40 is attained.

Figure 2. Mature compost