Why is HotRot Different?

HotRot is a uniquely designed high-efficiency composting system. Composting can be referred to as a biological oxidation process that takes unstable, putrescible waste, and produces stable compost; it can also be thought of as biological "combustion". Like any combustion or any oxidation process it relies on energy (waste) and oxygen (air). It also produces heat through the microbial oxidation process. It is imperative that one understands that heat is a function of the process not an input (heat is NOT added). Since the composting process is biological, moisture is also important. A thorough discussion of these topics is outlined in three reports available from Global Composting Solutions:

Part 1 – Composting context report.pdf

Part 2 – HotRot system summary.pdf

Part 3 – Understanding HotRot.pdf

Temperature is a poor indicator of compost performance – much like the temperature gauge in a car is a poor indicator of engine performance, the gauge (temperature) does not change between driving round town in traffic to driving down the highway but the rate of combustion and the rate at which energy is converted is vastly different. HotRot is a composting system driving down the highway.

During the composting process moisture, carbon dioxide (CO_2) and heat are generated. If any of these are allowed to accumulate, they will become inhibitory. The unique tine-bearing central shaft within a HotRot unit redistributes heat and moisture as it rotates. Excess heat, moisture and CO_2 are removed in the exhaust air stream. In traditional composting systems, excess moisture reacts with CO_2 and other volatiles and forms complex acids. This acidic moisture lowers the pH of the material that is composting and inhibits microbial growth. In addition, the excess moisture percolates down through the mass removing suspended solids and soluble nutrients and can accumulate as leachate. Because excess moisture and CO_2 are removed from a HotRot system in the exhaust air, acidic conditions do not develop, pH levels are higher, as are microbial numbers, and the composting process is therefore more efficient. In addition, excess moisture does not strip or leach nutrients from the material; nutrients remain in the compost where they belong.

The tines on the central shaft also physically "erode" or scrape the surface of the material as it composts, this exposes fresh material to the action of the composting microbes, further speeding up the composting process. HotRot is a continuous process, waste is added frequently (and automatically) in small amounts, which means fresh material is rapidly inoculated with actively composting material already in the unit – there is no "lag-phase", again speeding up the process. All these advantages allow the HotRot system to produce compost[1] in as little as 10 days. The

[1] Compost material discharged from the HotRot unit should still be stored for 2-4 weeks for complete maturation, especially if it is to be bagged.

relatively stable compost can be used in broadacre situations without further maturation, significantly reducing the land area required for the composting facility.

The efficiency of the HotRot system is clearly demonstrated by the following photos. The first two photos show the degradation of “compostable” tableware: one inside a HotRot unit with a residence time of 10 days and the other showing comparable degradation in a traditional static aerated container over the same time period.

Compostable tableware after 10 days in a HotRot composting unit (left) and after 10 days in aerated container (right).

The next photos show input material in a HotRot feed hopper (a mixture of food and garden waste – source separated organics) and the resultant compost and screen oversize after only a period of 5.5days; while this material will not be fully composted the photos serve to indicate the rapidity of the process.

Day 0 – Waste in feed hopper(left). Day 5.5 – Product from HotRot screened.