

Yard Waste Composting Process Subcommittee Meeting.  
October 17, 2005

The subcommittee met on October 17, 2005. Jeff Deats and I (Subcommittee Chairman Stephen Lange) were in attendance. At the meeting we discussed the various processes that exist throughout the region for composting yard "waste". We also discussed the current regulations, 503, the standard that has been developed for proper composting. We feel the need to continue the 503 standard in all processes in order to comply with state regulations, odor control, human health, and environmental concerns.

**The process:**

There are four levels of composting that are currently being utilized: "Minimal" Technology, "Low-Level" Technology, "Intermediate-Level" Technology, and "High-Level" Technology composting.

**"Minimal" Tech.** It is not recommended for communities unless they have large and well buffered composting areas. This process can take as many as three years to complete and has a high potential for odor issues and other environmental concerns.

**"Low-Level" Tech.** This is the most commonly used process for most communities. It is characterized by modest operating and maintenance requirements and limited equipment needs. This method utilizes windrow composting systems. Leaves and yard "waste" are formed into long narrow piles (windrows) and periodically turned, based on temperature and time, (averaging every 3-4 weeks), by a front-end bucket loader. The turning serves to mix and break up material, aerate the windrow, and release excess moisture. Proper periodic turning will insure uniform decomposition and result in a good quality product. Odor is still a concern, as are environmental issues with water run-off or contamination of the run-off water. This method, used effectively, will allow leaves and yard "waste" to be composted and moved off the composting area into curing piles in 10-12 months, allowing the following year's leaves and yard "waste" to be composted in the same area. This approach balances time, space, and fiscal considerations, and can produce a useable stabilized product in one year.

**"Intermediate-Level" Tech.** This type of operation also involves windrow composting, as in the "low-level" method, but utilizes more sophisticated and expensive windrow turning machines instead of front-end loaders for aerating and turning the windrows. Front-end loaders may be used to initially form the windrows, but a windrow-turning machine is used to shred, turn, and aerate the leaves and yard "waste", resulting in a more thorough and efficient blending than a front-end loader can achieve. This results in a more rapid decomposition of the organic material, requiring turning every week or two to maintain sufficient oxygen in the windrows. Leaves and yard "waste" can be composted in 4-6 months, approximately half the time of the "low-level" approach. This method is appropriate for large-scale operations (i.e., 4,000 tons or more) where it can be more cost effective given the greater efficiency of the windrow turning machines. Odor control and

environmental concerns such as water run-off and ground contamination remain present in this type of process.

**“High-Level” Tech.** There are several different systems that constitute a “high-level” technology method. These require less space and provide greater operation control, and usually result in shorter composting time than the composting methods described above. However, given the greater capital investment in equipment and higher operation and maintenance requirements, these methods are not usually considered appropriate for leaf and yard “waste” composting alone, and therefore, are not recommended. However, if leaf and yard “waste” are being used as a bulking agent for sludge or manure composting, then this method is appropriate.

The static aerated pile is an example of a higher technology approach. In static aerated pile or forced aeration composting, piles of organic material are aerated from below by blowers. These are controlled by timers or temperature feedback, moving the air through perforated pipes. Turning is required periodically to exchange inner and outer material. This process maintains near optimum levels of oxygen and temperature to maximize the rate of decomposition. The composting process can be complete in 2-4 months, depending on the degree of aeration and the concentration of green or high-nitrogen waste being composted. Odor and environmental concerns are greatly reduced in this type of process.

In-vessel composting is the highest technology approach. It consists of different proprietary systems that usually involve mechanical agitation and forced aeration, as well as being enclosed in a building or bag system. These are the most capital-intensive processes, and result in the greatest level of process and odor control, as well as the shortest time required for decomposition. This process is best suited for high population areas. Private operators of composting facilities would be better able to comply with local permitting, zoning, and land use requirements with this technology than any other method of composting. Once the composting process is complete, the product is moved to a curing area to be distributed or sold as a premium finished compost. It can then be bagged or sold in bulk quantities, fulfilling the market needs. There are also technologies that can recover the energy produced by in-vessel composting systems, thereby adding to the environmental benefit of using yard “waste” as a complete resource with little or no waste created.

It is the opinion of the processing subcommittee that “Intermediate” or “High Level” technology should be encouraged, as they will provide high quality products and the highest degree of human health and environmental protection.