A product of The Premier Green

COMPOSTING PARAMETERS

COMPOST COMPONENTS: consist of (1) nutrients, (2) carbon and nitrogen

Nutrients: Adequate phosphorous, potassium, calcium, iron, boron, copper, etc. are necessary for microbialmetabolism, but they are normally in the compost feedstock.

Carbon and nitrogen: The two basic ingredients in composting are carbon and nitrogen. Ideally the C:N ratio by weight should be 30:1. Too low a carbon ratio will result in excess nitrogen that is lost as ammonia gas that creates odor problems. Too high a carbon ratio inhibits the growth of microorganism populations and the compost will remain cool, and the composting degradation will be slowed. When the compost is finished, the C:N ratio will be 10-15:1 because the microorganisms will convert two thirds of the carbon-to-carbon dioxide. The sources of carbon (generally brown in color) and nitrogen (generally green) are as follows:

Carbon	CN ratio	Nitrogen	CN ratio
Straw	**40-100:1**	**Sewage Sludge (digested)**	**17:1**
Corn Stalks	**60:1**	**Cow manure**	**20:1**
Bark	**100 - 120:1**	**Poultry manure (with littler)**	**13 – 18:1**
Paper	**150 – 200:1**	**Pig manure solids**	**15 – 25:1**
Wood chips and sawdust	**100 – 500:1**	**Horse manure**	**25:1**

MICROORGANISMS: The main microorganisms in composting are aerobic bacteria and fungi. If adequate oxygen is not provided, the compost turns anaerobic (no oxygen), microorganisms die, and the compost generates putrid smells, including hydrogen sulfide.

COMPOST CONDITIONS

OXYGEN: Aerobic microorganisms can survive on 5% oxygen, but >10% is considered optimal. Oxygen is most commonly provided by turning the compost or by compressed air.

MOISTURE: Composting materials should contain between 40-60% moisture.
pH: A pH of 5.5-8.5 is ideal for the microorganisms. In early composting acids tend to accumulate and this promotes the fungi and the consequent breakdown of lignin and cellulose.

TEMPERATURE: The temperature in active compost piles range from 135-160° F which destroys pathogens and weed seeds. Temperature is controlled by turning and the addition of water.

COMPOST MANAGEMENT

TURNING: If the temperature falls below 122°F or rises above 150°F, the compost is turned.

WATER: Additional water can be added during turning if the compost is too dry.

TIME: The composting process occurs within 6-9 months. However, some in-vessel operations take only 30 days.

VOLUME: The loss of carbon dioxide and water may reduce the final volume of the compost by 50% or more.

ODOR TROUBLESHOOTING

ODOR	CAUSE	SOLUTION
Ammonia	Ammonia losses are a result of low C:N ratios. NH3 is at equilibrium with NH_4 at a pH of 9. Ata pH of >9, the ammonium gases to ammonia. Little ammonia is generated at acidic pHs.	Add carbon
Hydrogen sulfide	Hydrogen sulfide odors are generated if the compost becomes anaerobic. Hydrogen sulfide is more difficult to disperse because hydrogen sulfide is heavier than air, and they tend to accumulate in the compost area.	Add oxygen Turn compostto aerate

METHODS

WINDROW COMPOSTING: This is common in fields and is better on a concrete or impermeable surface. The compost can be turned with tractors or compost turners.

IN-VESSEL COMPOSTING: This refers to composting in metal or plastic tanks or concrete bunkers that confine the material in buildings, containers, or vessels which protect groundwater and confine odors. These systems start with anaerobic digestion and finish with aerobic digestion.

CONTACT INFORMATION:

The Premier Source | 100 Franklin Square Dr. Suite 400, Somerset, NJ
08873 732.344.4475 | Fax 732.463.7194 | info@thepremiersource.com
www.thepremiersource.com