ORGANIC AMENDMENTS

- Compost
- Biosolids “Class A and B”
- Animal manure “raw”
- Vermicompost or worm casting
- Compost or worm casting teas
Compost
WHAT IS COMPOSTING?

‘it’s a biological decomposition process where microorganisms convert raw organic materials into relatively stable humus-like materials’
COMPOSTING IS AEROBIC

Aerobic

Anaerobic

Vermicomposting

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MATERIALS FOR COMPOSTING

Poultry  
Dairy  
Horse  
Feedlot  
Gin trash  
Mushrooms  
Yard waste  
Biosolids  
Municipal solid waste  
Food waste
Regulations

1. Government (EPA)
2. State (DEP)
3. County and City
EPA REQUIREMENTS

**Biosolids Only:** Clean Water Act 40 CFR Part 503.

**Windrow:** The EPA requires compost to hold a temperature of 131 °F for 15 days and be turned 5 times.
DEP REQUIREMENTS
PERMITTED FACILITIES

State (DEP), Chapter 62-709, F.A.C. (Criteria for the Production and Use of Compost made from Solid Waste)
The DEP requires compost to hold a temperature of 131 °F for 15 days and be turned 5 times (No yard waste).

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“Normal Farming Operations”

- **State (DEP), Chapter 62-709, F.A.C. (Criteria for the Production and Use of Compost made from Solid Waste)**

- Normal Farming Operations are Exemption
  - Expanded to allow receipt of yard trash or manure
  - Policy memo SWM-01-8 clarifies this exemption
Under USEPA regulation 40 CFR Part 503 windrow composting

Temperatures of 131 °F or 55 °C for the first 15 days and turned 5 times will eliminate human and plant pathogen and kill weed seeds.
- Usually 130-150°F
- Heat should be controlled
PASSIVE AIR MOVEMENT IN A COMPOSTING WINDROW OR PILE
Temperatures below 113°F

Microorganisms multiplying and breaking down easily available carbohydrates begin to heat up pile.

pH begins to drop as acids are produced
Growth of actinomycetes and fungi which digest hemicelluloses
Appears to be critical for developing disease-suppressiveness of composts
PARAMETERS USED TO MONITOR WINDROWS

- Temperature and turning records
COMPOST RECOMMENDATIONS
CONVENTIONAL PRODUCTION

- Florida requires EPA 503 all materials.
- Florida yard waste (YW): No EPA 503 requirement:
  1. Obtained YW compost from a facility that follow EPA 503.
  2. Test pathogens such as Salmonella and E. Coli.
  3. Apply material 90-120 days before harvest the crop or with cover crop (NOP).

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The National Organic Program (NOP) requires organic material must be composted or apply material 90-120 days before harvest the crop or with cover.
Under USEPA regulation 503 windrow composting: temperature of 131°F for 15 days and turned 5 times will eliminate pathogen and kill weed seeds.

Bag 1 - Average temperatures per day over a three month period. Composting product meets with part 503 recommendations for pathogen and vector control. Material composted above 55°C from July 12th through 24th, a total of 18 days.
Biosolids
Biosolids, also known as sewage sludge, are a byproduct of treated, stabilized and disinfected waste water and human waste that originate from household wastewater, industrial wastewater, and storm water runoff.

1. Pre-treatment regulations require that plants treat or remove any contaminants from waste water before it is discharged to a municipal treatment plant (plastics, rags, rocks, etc.). The raw materials (sewage sludge) from the previous stages must be processed more to produce biosolids.

2. The treatment objectives are to kill disease-causing organisms such as bacteria and viruses, and reduce odors.
THE MOST COMMON PROCESS TO SIGNIFICANTLY REDUCE PATHOGENS CLASS “A” AND “B”

1. **Anaerobic digestion**: involves the use of a sealed, oxygen-free container (the digester) and anaerobic bacteria (methane-rich biogas, fiber and waste water).

2. **Aerobic digestion**: is similar to anaerobic digestion, but it is in an oxygen rich environment such as a tank or lagoon.

3. **Composting**: USEPA 503

4. **Heat treatment**: uses active or passive dryers to remove water from biosolids.

5. **Lime**: is added to the biosolids to raise the pH to acceptable soil amendment levels after 2 h of contact.

6. **Air-drying**: biosolids may be dried on sand beds or in paved or unpaved area. Biosolids dry for a minimum of 3 months with an ambient average daily temperature above 32 °F.
BIOSOLIDS TYPES

Class A:
- Can be land applied without any pathogen-related restrictions at the site.
- < 1,000 MPN.g⁻¹TS (Fecal Coliform or < 3 MPN 4g⁻¹TS Salmonella spp).
- Pellet or granular can be used as a commercial fertilizer.

Class B:
- Requirements ensure that pathogens have been reduced to levels that protect public health and the environment.
- < 2,000 MPN.g⁻¹TS.
- Include restrictions for crop harvesting.
Aerobic digestion
Air-drying
1. Biosolids “A” no restrictions.

2. Biosolids “B” crops with harvested part that touches the biosolids/soil mixture shall not be harvested for 14 months after application of biosolids. Crop with harvested part that does not touch the biosolids/soil mixture shall not be harvested for 30 d after application of biosolids (plastic beds can be the physical barrier for vector attraction reduction).

3. Apply materials 90-120 days before harvest the crop or with the cover crop (NOP).
Sewage sludge or biosolids under the National Organic Program (NOP) is prohibited (P) in organic production.
Animal Manure “Raw”
ANIMAL MANURE “RAW”

Poultry broiler house litter
Poultry stockpiled litter
Poultry layer-deep pit
Poultry layer-under cage
Horse (with and without bedding)
Dairy (with and without bedding)
Swine (with and without bedding)
Beef (with and without bedding)
Rabbit (with and without bedding)
Goat (with and without bedding)
No laws or regulation!

Suggestions:
1. Test pathogens such as Salmonella or/and E. Coli.
2. Apply materials 90-120 days before harvest the crop or with cover crops (NOP).
1. Prohibited the used of raw manure for at least 90 (crops with non-contact with the soil) and 120 days (crops with contact with the soil) before harvest of crops grown for human consumption.

2. Composted!
Vermicompost or Worm Casting
Suggestions:
1. Vermicompost should be made from materials that have maintained a temperature of at least 131°F for 15 days and 5 turning (USEPA 503).
2. Test for E. coli or/and Salmonella.
6. Apply material 90-120 days before harvest the crop or with the crop (NOP).
Vermicompost or Worm Casting
Compost or Worm Casting Teas
1. Use only potable water to make compost tea or to dilute it.
2. Sanitize all equipment used to prepare compost tea.
3. Make compost tea only from compost that has maintained a temperature of at least 131°F for 15 days and 5 turning (USEPA 503).
4. Avoid additives when fermenting compost tea, as these can promote the growth of pathogens. In particular, simple sugar sources, like molasses, should be avoided.
5. Additives can be used if sample batches of compost tea are tested before using to make sure it meets the EPA’s recreational water quality guidelines for F. coliform.
6. If compost tea is made with additives but is not tested, or if it doesn’t meet water quality guidelines, then food crops may not be harvested until 90–120 days after the compost tea has been applied.
CONTROL LABORATORIES
http://www.controllabs.com/compost.htm

Woods End Laboratories
http://woodsend.org/