Lesson 8: Operations – Curing and Post-processing

Learning Objectives:

- Understand the importance of curing to compost quality
- Know the difference between “stability” and “maturity”
- Comprehend proper curing procedures

Controllable Variables

- Pile size and mechanics
- Temperature
- Aeration
- Moisture
- Porosity
- Residence time

When Is Compost Finished?

- In general, when it:
  - Does not re-heat when the pile is turned
  - Has little or no recognizable raw material in it
  - Has a pleasant earthy smell
  - Has a rich brown color
- Specifically, when it:
  - Is properly cured

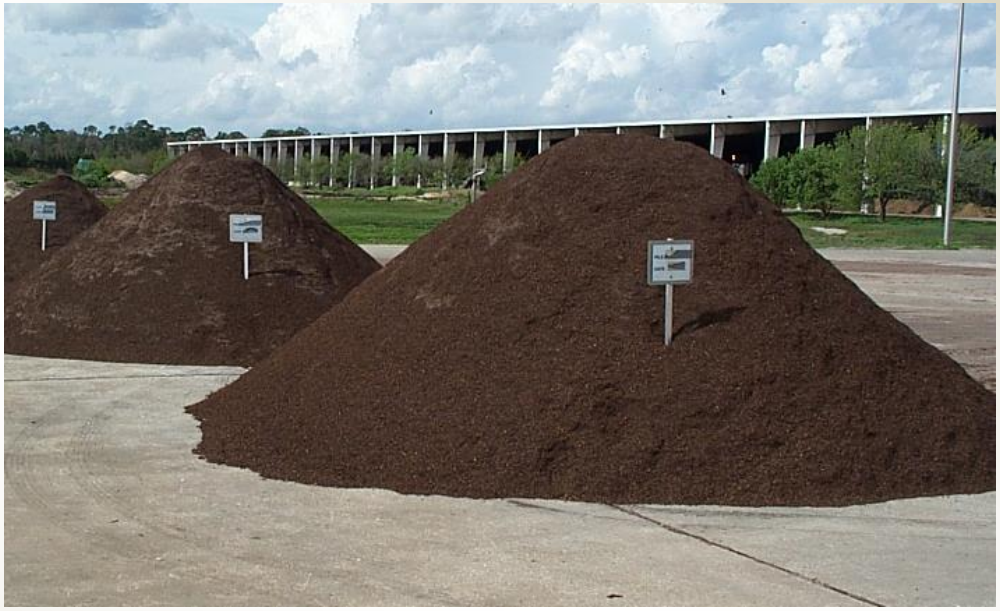

Photo source: FORCE Reedy Creek

Cured versus Uncured Compost

- “Cured” means aged, seasoned, not fresh, etc.
- Cured compost can be safely applied to plants and the soil without risk of harming plants or binding-up soil nutrients
- Uncured compost may be phytotoxic or suppress healthy plant growth while binding soil nutrients

Stability and Maturity

- Stability is a measure of biological activity:
  - Stable means low biological activity
  - Unstable means high biological activity
- Maturity is a measure of the decomposition process:
  - Mature means decomposition is complete
  - Immature means decomposition is not complete
- Well-cured compost is stable and mature

Measures of Stability

- Respirometry (O_2 or CO_2)
  - Measures level of microbial breathing by O_2 consumed or CO_2 released
- Dewar Self-Heating Flask
  - Measures heat generated by microbes
- Solvita®
  - Measures CO_2 with colorimetric strip
- Plastic Bag
  - Assesses malodor generation

Measure of Maturity

- Bioassay
  - Measures seed germination & growth
- Ammonium:Nitrate Ratio
  - Measures amount of unstable / reactive nitrogen
- Solvita®
  - Measures NH_3 with colorimetric strip

Combined Assessment: C:N Ratio, Stability and Maturity

- Some materials may be stable but not mature; some may have low C:N but unstable
- USCC TMECC Compost Quality Index:
  - C:N ratio ≤25:1
  - Stable or very stable (commonly measured by CO_2 evolution)
  - Mature or very mature (commonly measured by bioassay or NH_3 concentration)

Curing Procedures

- Large windrow dimensions are appropriate up to 8 ft high
- Curing time can range from 30 to 60 days
- Compost should be turned occasionally to provide oxygen (2 to 3 turnings)
- Monitor temperatures 2x weekly and after turning
- Allow compost to dry somewhat but maintain adequate moisture (35% - 45%)

Post-processing Procedures

- Screening is optional depending on end use of compost
- Screen compost to:
  - Produce fine-textured, uniform product
  - Remove undecomposed woody particles and contaminants
- Typical screen size is ¼ to ½ inch

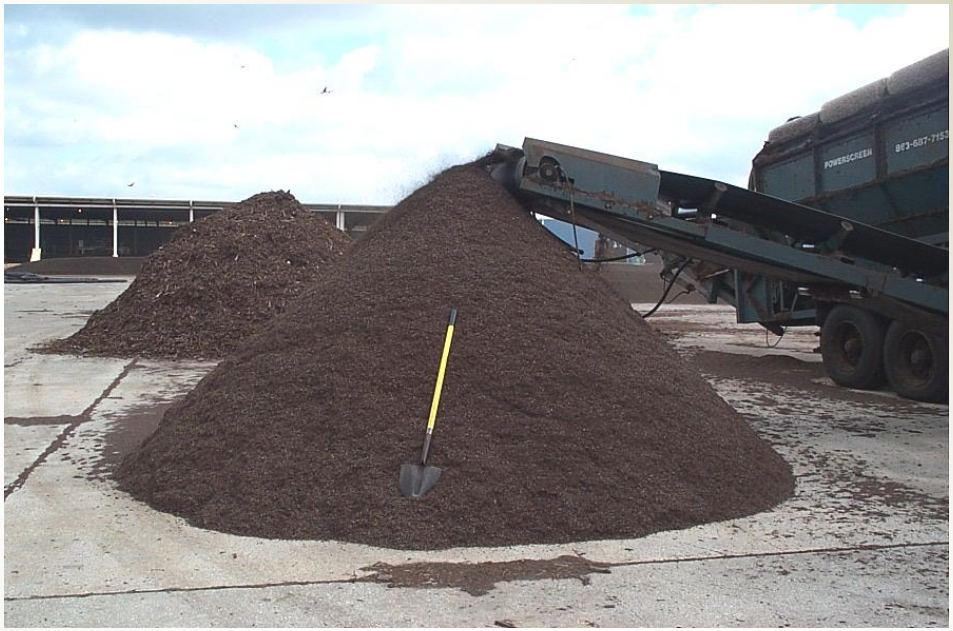

Photo source: FORCE Reedy Creek

Preventing Cross-contamination

- Do not re-inoculate curing or finished compost with pathogens from fresh materials
- For larger operations: utilize separate buckets for curing & post-processing
- For smaller operations: wash and air dry bucket prior to handling curing or finished compost