Process and Equipment

14th Better Composting School

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Process

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Secure Feedstocks

Determine what is available:

- How Much
- Form
- Location
- Availability
- Stability
- Storage Requirement



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Create Optimal Environment

Feedstocks ⇨ O_2, H_2O, Nutrients ⇨ Microorganisms ⇨ Compost

- Static Piles
- Passively Aerated
- Aerated Static Pile
- Turned Windrows
- In-vessel
- Animal Mortality




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Pile Formation



Recipe – C:N, MC, particle size…
Measure Method – weight or volume
Mixing Method – layer, mixer, tub grinder
Form – loader, manure spreader, conveyor

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Blending Process

Batch Mixing


Layering


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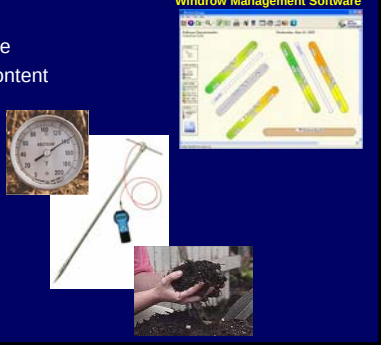
Active Phase

Monitor:
- Temperature
- Moisture Content
- Oxygen
- Odor

Aerate
- Loader
- Turner

Screen

Windrow Management Software



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Equipment

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Equipment

Considerations:
- Types of Material to be Processed
- Quantity of Material
- Processing Needs
- Capacity
- Typical, specialized, multi-use equipment

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Size Equipment to Meet Needs

Operational Needs:
- Method
- Processing
- Optimize Space Utilization

Anticipated Growth

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Volume Calculation

1. **Calculate number of cubic yards/ windrow**
2. **Calculate the capacity of the pad**

Given:

Windrow size: 6' high x 16' wide x 410' long
Aisle: 6' wide
Pad Size: 200' wide x 450' long
Maximum number of windrows on pad at one time: 8
Length of active phase: 17 weeks

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Volume Calculation

1.Calculate number of cubic yards/ windrow

Use low parabolic formula:

$$= \frac{[0.6667][(\text{width} * \text{height})\ (\text{length})]}{27 \text{ cu ft/cu yd}}$$

$$= \frac{[0.6667][(6 * 16)\ (410)]}{27 \text{ cu ft/cu yd}}$$

$$= 971.9 \text{ yd}^3\text{/ windrow}$$

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Volume Calculation

2. Calculate the total capacity of the pad:

Calculate number times pad will turnover in 12 months:

$$= \frac{52 \text{ weeks/ year}}{17 \text{ week active phase}}$$

= 3 times/ 12 months

Calculate capacity of pad:

Capacity of pad = pad turnover * number of windrows
= 3 times/ year * 8 windrows/ pad use
= 24 windrows/ year

Calculate total capacity of pad:

Total capacity = yd^3 / windrow * number of windrows/ year
= 972 yd^3 / windrow * 24 windrows
= 23,328 yd^3

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In-vessel

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Processing Equipment

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Moving Materials

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Attachments

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Mixing

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Turning






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Screening





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Bagging

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