

The background of the slide features a blue-tinted image of a lion's head sculpture, likely the Nittany Lion at Penn State University. The lion is shown in profile, facing right, with its mane and facial features clearly defined.

The Business of Composting

15th Better Composting School
October 22 - 24, 2008

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Penn State University

**Organic Materials Processing and Education
Center**

How much does it cost to compost?

It depends on the situation

Can you make money composting?

Maybe



Types of Costs



Operating Costs:

- Moving Materials
- Monitoring Windrows/Piles
- Site Maintenance
- Equipment
- Equipment Maintenance
- Pad Cost

Administrative Costs:

- Record Keeping
- Public Relations
- Securing Feedstocks
- Marketing Product

**Account for
everything**

How to Determine Costs

Need to know:

- Hours of productivity in a work day
- Labor rate
- Type of equipment required to meet needs of operation
- Equipment rate
- Pad rate

Maintain a Log for Every Task:

- Include labor, equipment and supplies

Enterprise Accounting:

- Compost production, mulch manufacturing, soil blending

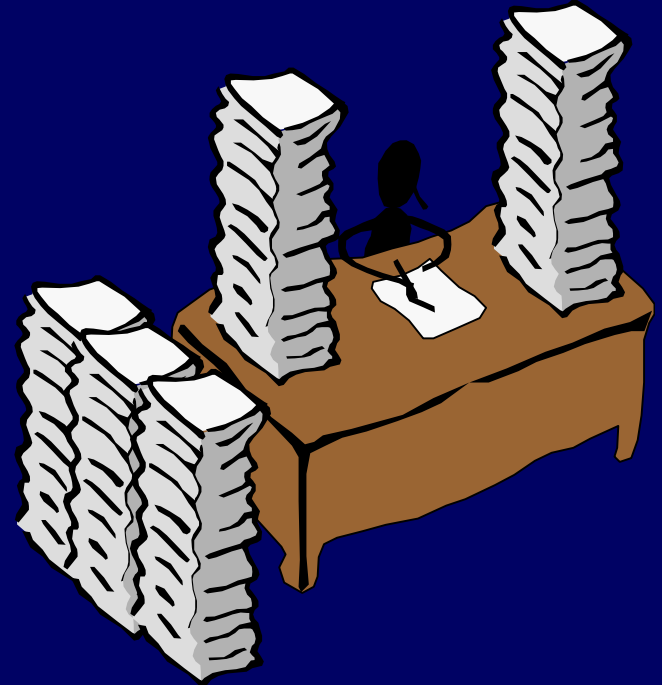
Estimate Future Costs

Labor Productivity

Scenario:

8 Hour work day:

- Travel to site – 15 minutes
- Morning break – 15 minutes
- Lunch – 30 minutes – (unpaid)
- Afternoon break – 15 minutes
- Return travel – 15 minutes
- Start up and end day – 30 minutes



Available Hours for Productive Work – 6.5 hours

Equipment Needs

Consider:

- Feedstocks Processed
 - required preprocessing and quantities
- Method of Composting
 - static pile, windrow, in-vessel
- Method of Turning
 - loader, turner
- Available Space
 - pad and stockpile area



Determine Equipment Rate

Cost

Financing

Routine Maintenance

- frequency and cost of oil change, greasing...

Repairs

- tires, engine overhaul...

Hours of Operation

Fuel



Loader

Cost: \$100,000.00

Interest: \$27,278.00

– finance 10 years @ 5%

Oil Change: (per service) \$150.00

Grease: \$12.50

– .5 hour/ every 10 hours of operation

Hours of Operation/ year: 500

Fuel: (gallons/hour) 1.5

Repairs and Maintenance: ??

Potential Loader Costs



Engine Overhaul	\$5000.00
Tire Puncture (/tire)	\$450.00
Transmission	\$10,000.00
Hydraulic System	\$1,700.00
Key (overnight shipping \$45)	\$52.00
	<hr/>
	\$17,202.00

Average cost/hour = \$1.72

(Life of loader = 10,000 hours)



Loader Cost/ Hour

Scenario: Life of loader 10,000 hours

– Principal and Interest	\$127,278
– Routine Maintenance	\$20,500
• oil change 40 @ \$150/, greasing 1,000 @ \$12.50/, cutting edge 10 @ \$200/	
– Tires	\$3,200
• 2 sets @ \$1800/	
– Fuel	\$41,250
• 15,000 gallons @ \$2.75/	
– Repairs	\$20,000
	<hr/>
	\$212,228.

Cost/ hour \$21.22

Windrow Cost Analysis

Scenario:

- Process ~ 12 tons feedstocks/day
- Windrow size: 5' H x 10' W x 150'L
- Pad size: ~ 1 acre concrete surface

Need to Know:

- Tons/ windrow and length of time to construct
- Number of times turned
- Hours labor and equipment
 - mixing, monitoring, trash pick-up, turning, screening

Account for Labor and Equipment

Name/Operator: _____

Enterprise: _____

Date: _____

Total Time: (HOURS) _____ Overtime: (HOURS) _____	Labor	Loader	Mixer	Tractor	Mower	Truck	Turner	Fleece Roller	Screen	Passenger Vehicle	Other: _____	Other: _____
	HOURS											
Travel												
Detach/Attach Equipment												
Mixing												
Fleece Covers												
Turning												
Screening												
Loading/Hauling												
Temperature Recording												
Watering												
Site Maintenance												
Equipment Maintenance												
Data Entry												
Other:												
Other:												

Description of work performed: _____

Windrow Cost Analysis

Tons/ windrow = ~100

Length of time to construct = 6 days

Number of times turned = 5

Hours labor and equipment:

- mixing = 2 hours labor, tractor and mixer/ day.
1.5 hours loader/day.
- monitoring and trash pick up = 0.25 hours 3x/week
- turning = .5 hours labor, tractor and turner/ turn
.25 hours loader
- screening = 3.5 hours labor, screen, loader and
truck

Windrow Cost Analysis

Mixing (\$163/day) **\$978.00**

Monitoring/Maintenance (\$17/week) **\$250.00**

Turning (\$41/turn) **\$205.00**

Screening (\$100/hour) **\$350.00**

Pad Use Cost (concrete surface) **\$325.00**

Misc. - (lab fees, administrative) **\$350.00**

Cost/ windrow **\$2,458.00**

Cost/ yd³ (finished compost) ~\$27.50

Net Income/ Windrow

Tipping Income: (ave. tipping fee/ ton \$40) **\$4,000.00**

Finished Compost: (yield 90 yd³ @ 15/yd³) **\$1,350.00**

Cost of Production: **<\$2,458.00>**

Net Income/ Windrow: \$2,892.00

Account for Inflation

Calculate production costs and compound forward by selecting an inflation rate and period of time

Future Cost = FC

Present Cost = PC

Inflation (%) = i

Number of Years = n

$$FC = PC(1 + i)^n$$

Cost in 10 years

Present Cost/ windrow = \$2,458.00

Inflation = 2.75%

$$FC = PC(1 + i)^n$$

$$FC = \$2,458(1+.0275)^{10}$$

$$FC = \$2,458(1.3117)$$

Cost/ Windrow in 10 years = \$3,224.04

Additional Factors

Weather

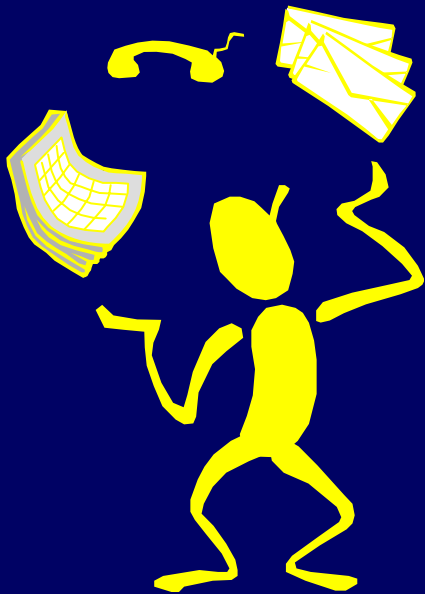
Odor

Quality

Down time

Skill of operator

Opportunity Cost



Remember

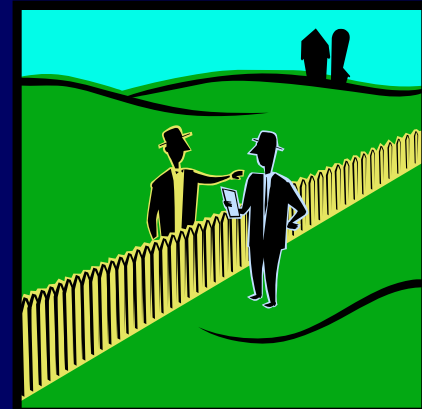


Account for everything

Product has value

Receive a tipping fee for feedstocks

Be a good neighbor





Costs are specific to operation

apply cost analysis methods to each situation

**Cost information is essential to
determining profitable endeavors**

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Calculate the Cost of a Windrow

Calculate:

1. Hours of labor and equipment required for windrow
2. Total cost of production associated with windrow

Given:

Tons/ windrow: ~200

Length of time to construct: 5 days

Number of times turned: 5

Length of active composting: 10 weeks

Labor and Equipment

Rates:

Labor: \$23.00
Tractor: \$25.00
Mixer: \$15.00
Turner: \$50.00
Screen: \$30.00
Truck: \$20.00
Loader: \$27.00

Time and Equipment:

Mixing: 3 hours labor, tractor and mixer/ day
2 hours loader/day
Monitoring and maintenance: 0.25 hours 3x/week
Turning: .75 hours labor/ turn
.5 turner/ turn
.25 hours loader/ turn
Screening: 5 hours labor, loader, screen and truck

Steps

- 1. Determine total hours for labor and each piece of equipment for mixing, monitoring, turning and screening**
- 2. Add individual totals to get total cost of production**



Solution

Task	Labor & Equipment						
	<i>Labor</i>	<i>Loader</i>	<i>Tractor</i>	<i>Mixer</i>	<i>Turner</i>	<i>Screen</i>	<i>Truck</i>
<i>Mixing</i>	15	10	15	15			
<i>Monitoring...</i>	7.5						
<i>Turning</i>	3.75	1.25			2.5		
<i>Screening</i>	5	5				5	5
Total Hours	31.25	16.25	15	15	2.5	5	5
Rate/ hour	\$23.00	\$27.00	\$25.00	\$15.00	\$50.00	\$30.00	\$20.00
	\$718.75	\$438.75	\$375.00	\$225.00	\$125.00	\$150.00	\$100.00
Total Cost of Production	\$2,132.50						