



# Making Organics Work for You

*Integrating Composting into Waste Management Plans*



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# Why Compost?



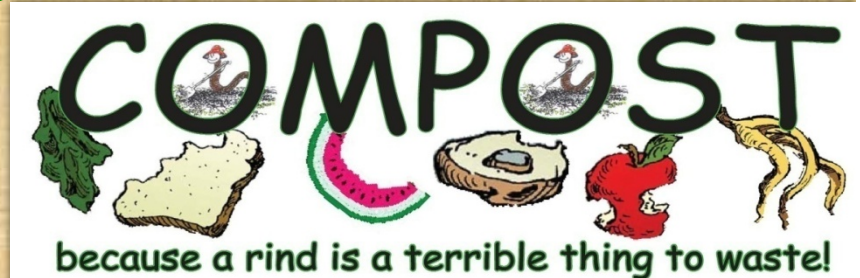
**Managing Organic Waste through Composting Reduces Volume by 50%**



- ❑ Reduce the yuk factor of organics
- ❑ It does not burn well
- ❑ Fills up Landfills
- ❑ Convert organics into a soil like product
- ❑ Holds soil moisture during dry seasons
- ❑ Helps to Suppress Plant Disease
- ❑ Improves soil quality
- ❑ **Clean Compost = Healthy Soil = Good Food = Healthy People**



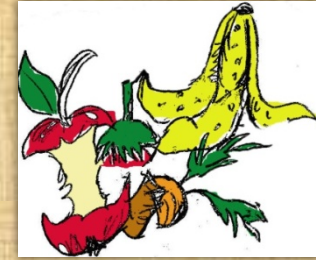
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# Feedstock



Food waste



Food processing



Manure

Weeds

Garden residuals



Leaves

Yard waste



Pond weeds

Fish/meat

Biosolids

Dairy Waste

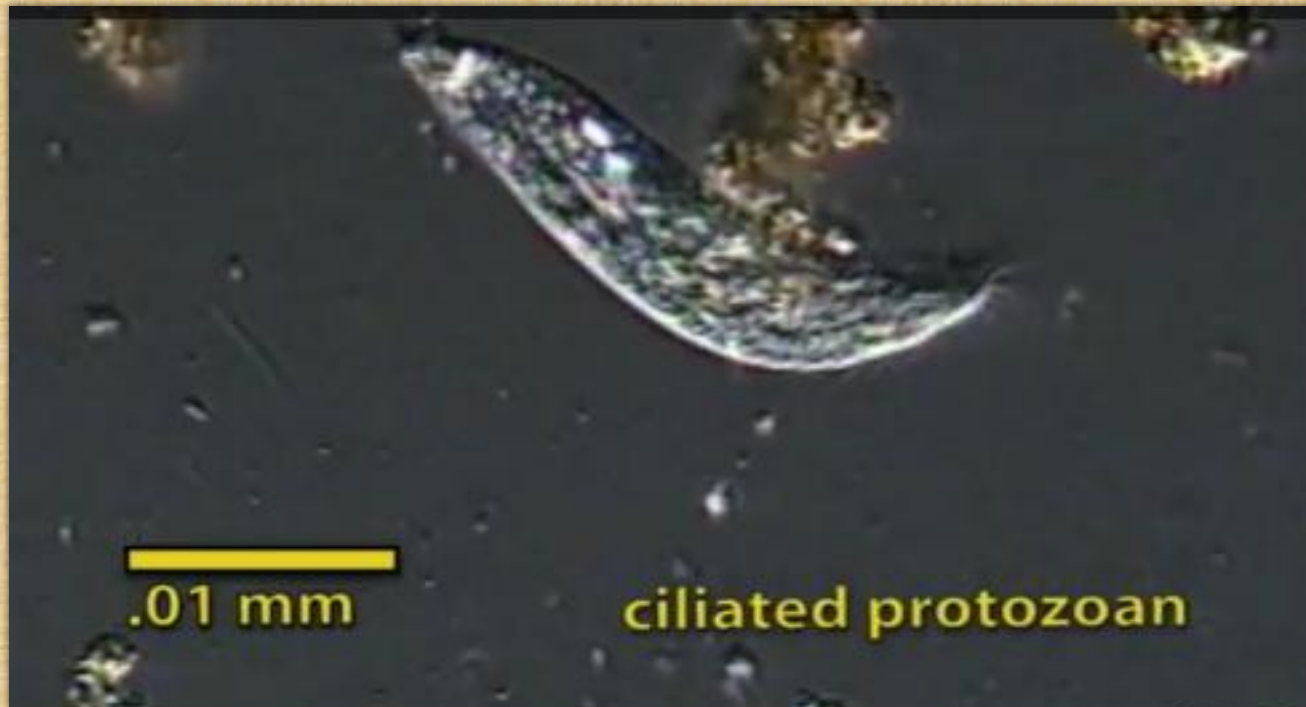




Fungi and molds are also important. This *Meripilus giganteus* (giant polypore fungi) appears on stumps and at the base of some living broad-leaved trees.



# Organisms Involved in the Compost Process



Source: Vermicompost: A Living Soil Amendment video by Allison Jack



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*Springtails*



Rove Beetle



*Mites*

All decomposers are bound together in a complex feeding web. They turn organic wastes into a beneficial soil conditioner.



Snail



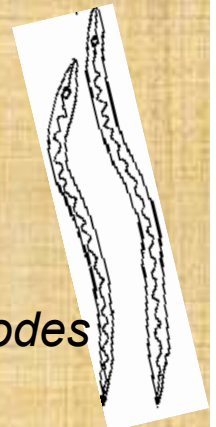
*Spiders*



Sowbug



*Earthworms*



*Nematodes*



# What Makes the Compost Process Work?

**Micro and macro organisms are key....**

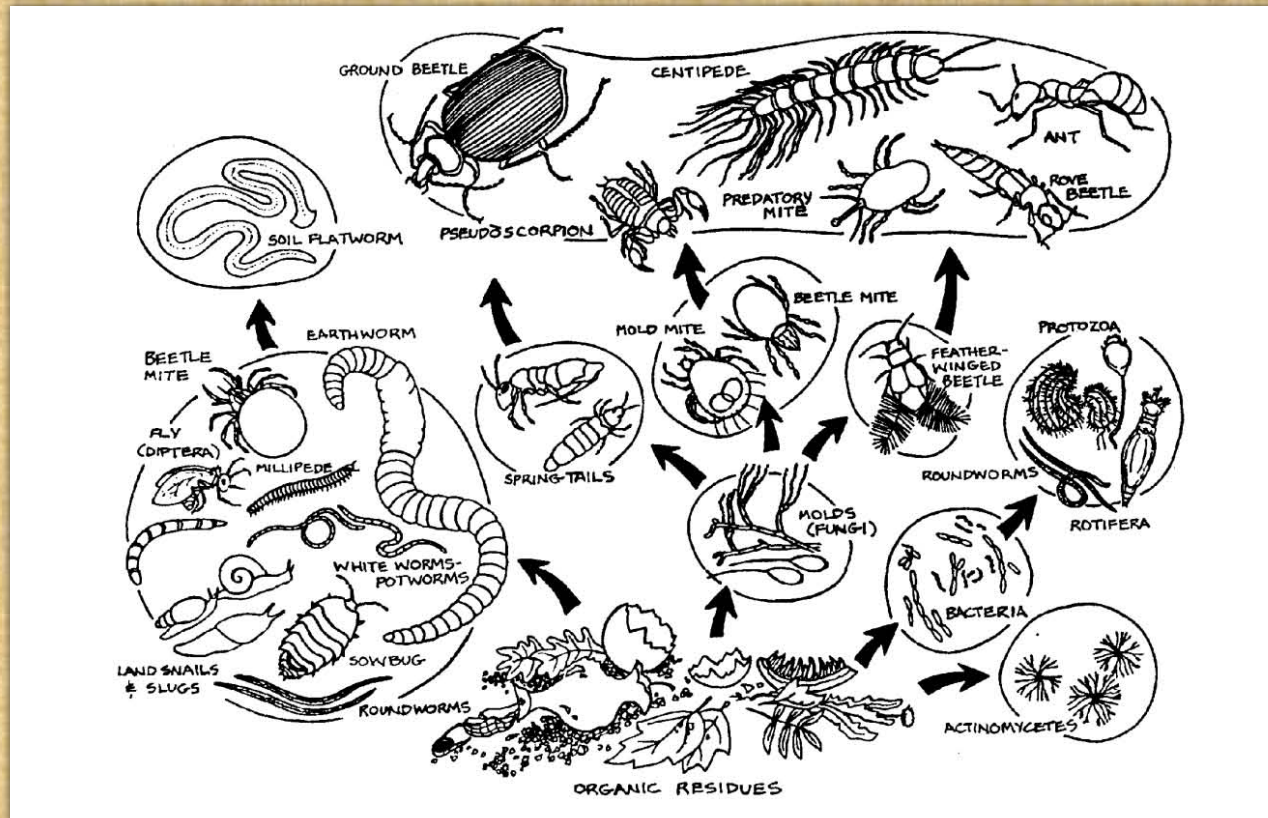
**They require**

**1. Food**

**2. Shelter**

**3. Moisture**





Composting is a microbiological process. Organisms use decaying matter as their food source. Bacteria are among the simplest and most common organisms. Single-celled and microscopic, they are found almost everywhere in the environment.





Earthworms are perhaps the most familiar decomposer. By blending soil and organic matter in their digestive track, they produce stable, nutrient-rich aggregates (worm castings) that improve the structure of soil.



## Q. What Generates Heat in a Compost Pile?

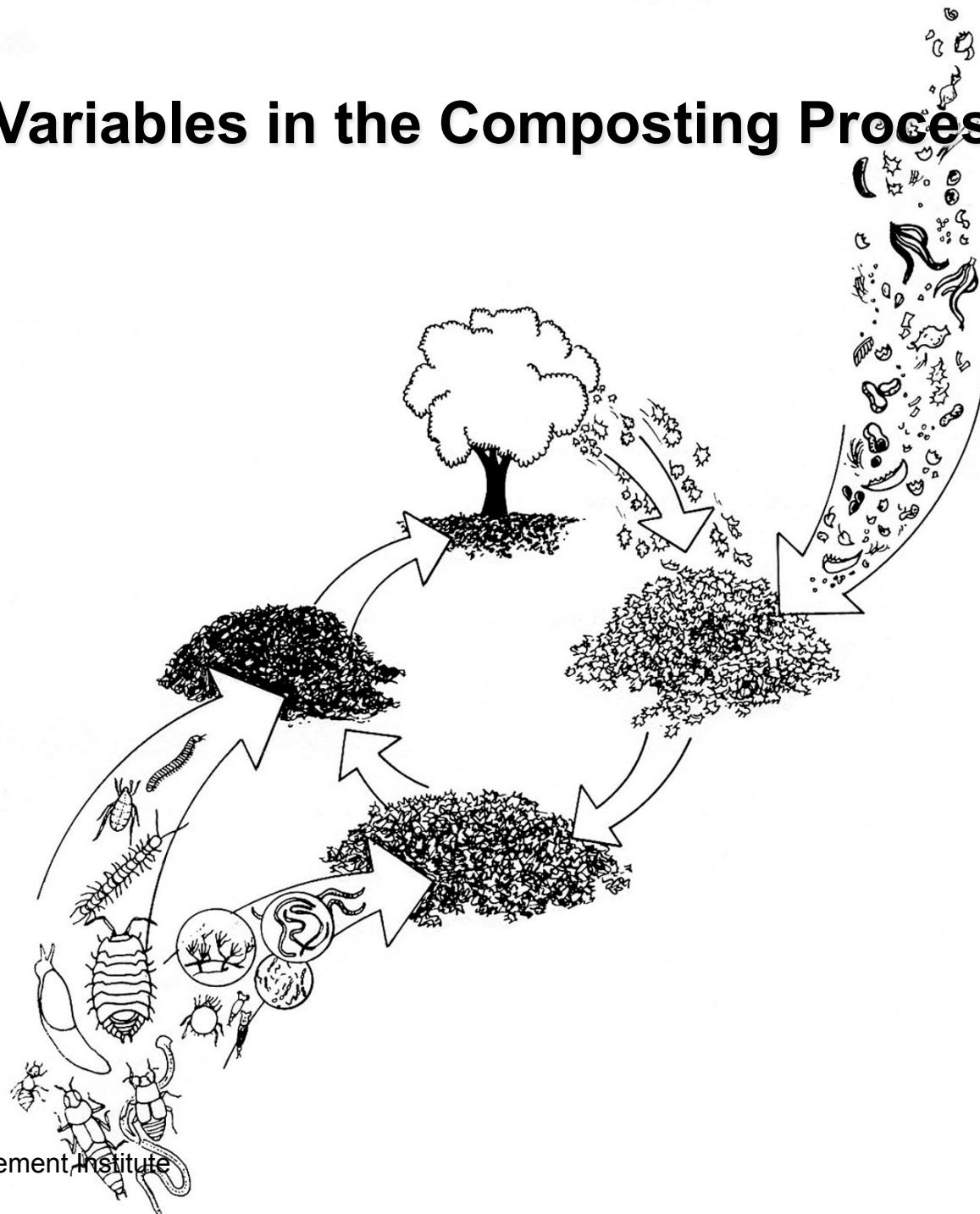


Minimum size: one cubic meter. Heat is given off as organisms feed on wastes and breaking it down into less complex molecules.

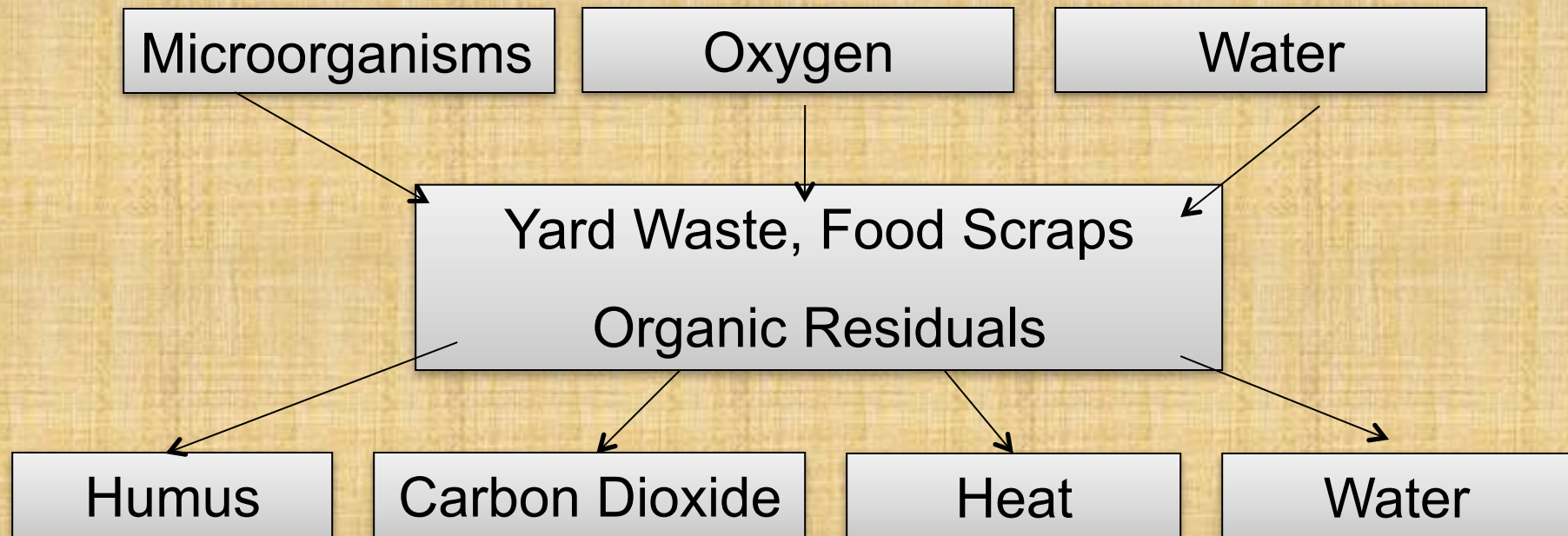
Temps: 30° -55°C. High temperatures help kill weed seeds and disease organisms



# Variables in the Composting Process



# The Composting Process



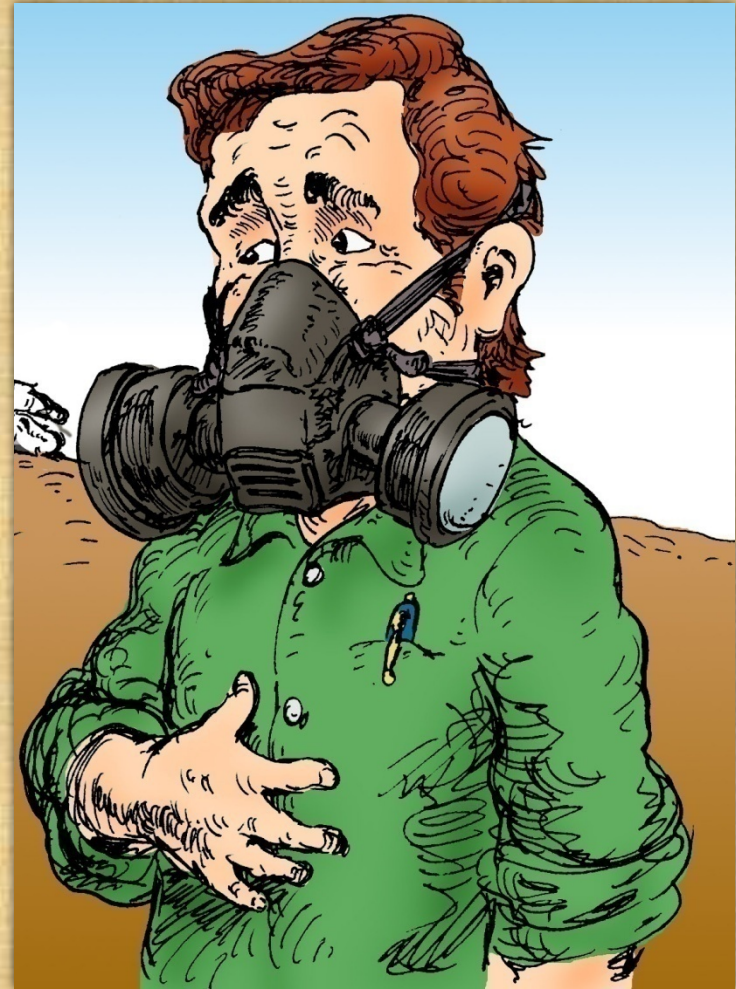
While the natural process of decomposition will occur without any assistance from us, several factors can be managed to accelerate the compost process.



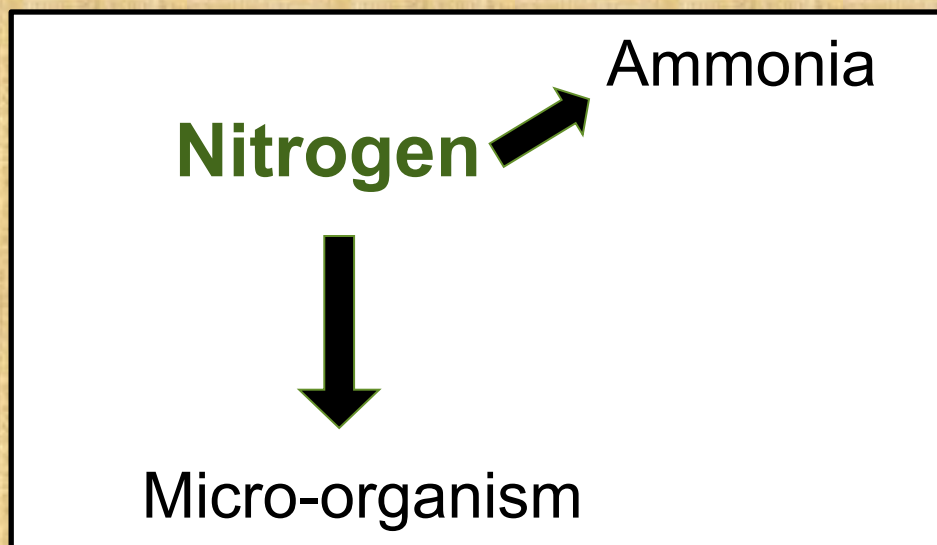
Aerobic organisms require oxygen to live. Their "aerobic" activity produces carbon dioxide and heat as by-products. If oxygen starved, the process can become "anaerobic."

**IT STINKS!**

The by-products of anaerobic decomposition include methane and hydrogen sulfide gas. Hydrogen sulfide smells like rotten eggs.



# Nitrogen Cycle



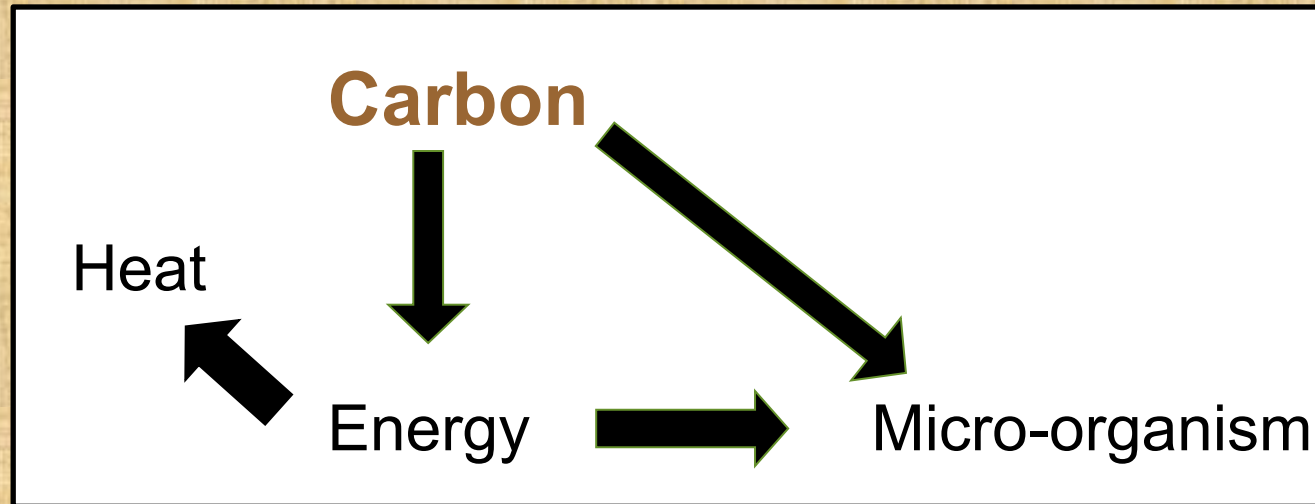
Organisms use nitrogen to grow and reproduce.

Low nitrogen = slow decomposition

Excess nitrogen = ammonia will volatilize, creating odor



# Carbon Cycle



Organisms utilize carbon as a source of energy.

Low carbon = wet pile, dense conditions

Excess carbon = dry pile, slow decomposition



# Materials With High Nitrogen Value

<u>Material</u>	<u>C:N</u>
Humus-Compost	10:1
Food Wastes	15:1
Grass Clippings	20:1
Cow Manure	20:1
Horse Manure	25:1

The optimum C:N ratio is about 30 to 1. This ratio will make fast, hot compost. Grass, animal manures and fresh green plants are high in nitrogen.



# Materials With High Carbon Value

<u>Material</u>	<u>C:N</u>
Fruit Wastes	35:1
Foliage	40-80:1
Corn Stalks	60:1
Straw	80:1
Bark	100-130:1
Paper	170:1
Sawdust	500:1
Wood	700:1

Leaves, brush, sawdust and wood chips are good sources of carbon. Blending carbon sources with nitrogen-rich materials can balance C:N ratio.





Surface area is another key factor to consider; decomposition occurs in thin films on the surface of particles. A large particle has less total surface area than the same particle chopped up.

\*Large particles (woodchips) = better aeration and less labor but take longer to breakdown.

\*Small particles (sawdust) = more surface area, less pore space to circulate air and more labor to aerate.





Organisms need moisture. Decomposition will slow with too much or too little moisture. The optimum moisture content for compost is 40-60%, damp enough so that a handful feels moist to the touch, but dry enough that a hard squeeze produces no more than a drop or two of liquid.



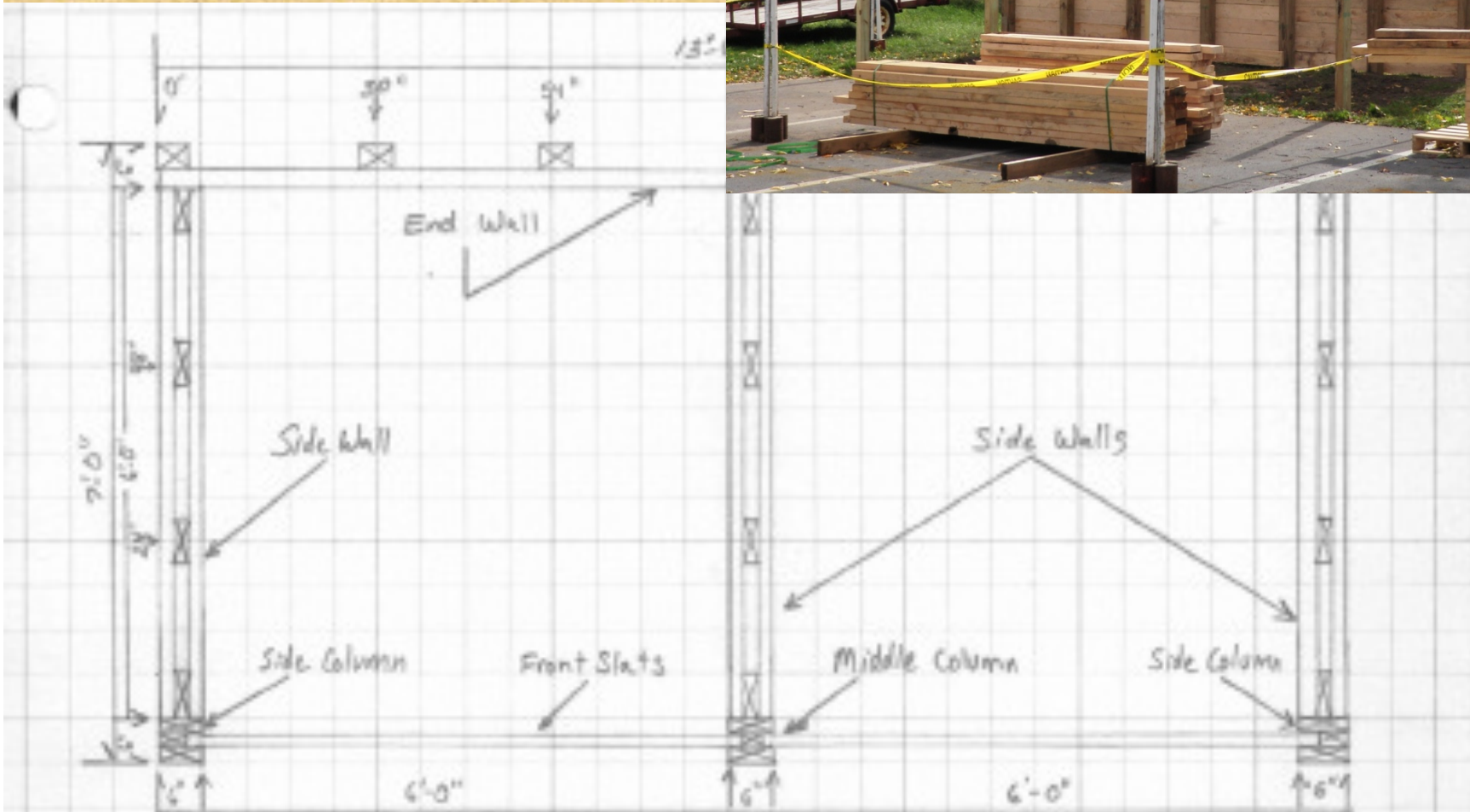


# Moisture



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# Plans for 2-bin System - 6'x6'x6'





Three bin **turning unit** with removable front boards.



# Cayuga Compost



# Tractor Pulled Straddle Turner





**Fully Hydraulic**



**Tarp Systems**









# Multi Bin System









# Earth Bin



# West Irondequoit Central School

## – Earth Bin



# Foster Bros. Moo Doo



# Curing Windrows



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# Windrow Composting



Forced Air  
Composting

# Rotary Drum Composter



# Vermi- Composting

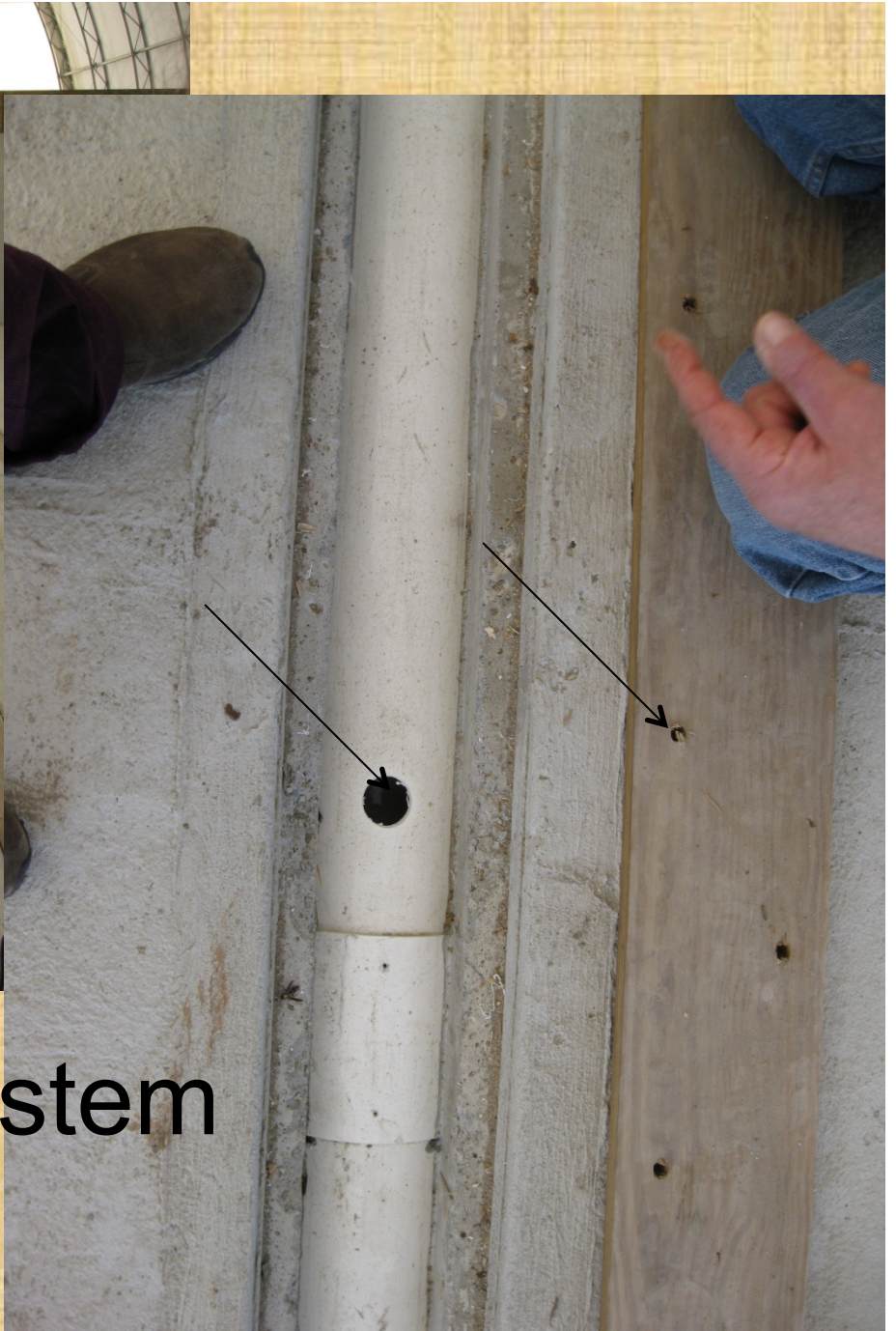




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# Heat Transfer





# Simple Aeration System

Sunset View Acres

# Adding Manure Bank



Diamond Hill Custom Heifers  
4-5 million BTU/day

# Composting Liquids





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# Recycling Organics Makes Good Sense!

Healthy Soils =  
Healthy Food!

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**DON'T TREAT YOUR SOIL LIKE DIRT™**