

# Making and using compost in your backyard



University of Wisconsin-Extension  
Master Composter Program





# What is composting?



**Controlling the natural process of decay to transform organic wastes into a valuable soil amendment called compost.**





# Why compost?

## Waste management

- Yard waste banned from landfills
- Encourages responsibility for your waste
- Reduces need for municipal collection

## Finished Compost

- Valuable soil amendment
- Healthy soil leads to healthy plants
- Save \$





# Benefits of adding compost to soil

- Supplies organic matter
- “Lightens” heavy soils
- Improves moisture retention in sandy soils
- Contains humus – “soil glue”
- Improves soil structure





# Benefits of adding compost to soil

- Encourages vigorous root growth
- Allows plants to more efficiently utilize nutrients
- Enables soils to retain nutrients
- Buffers soil pH
- Supplies beneficial microorganisms
- Feeds soil life





# How is compost made?

**Natural process:**

**Biological decomposition of organic matter in the presence of oxygen**

**Human influenced:**

**We can speed up or slow down the process**





# Microbes do the work

- Bacteria (including actinomycetes) and fungi
- Chemical decomposers – enzymes
- Found in:
  - Soil
  - Leaves
  - Food scraps
  - Manure
  - Finished compost

Are compost  
starters  
needed?





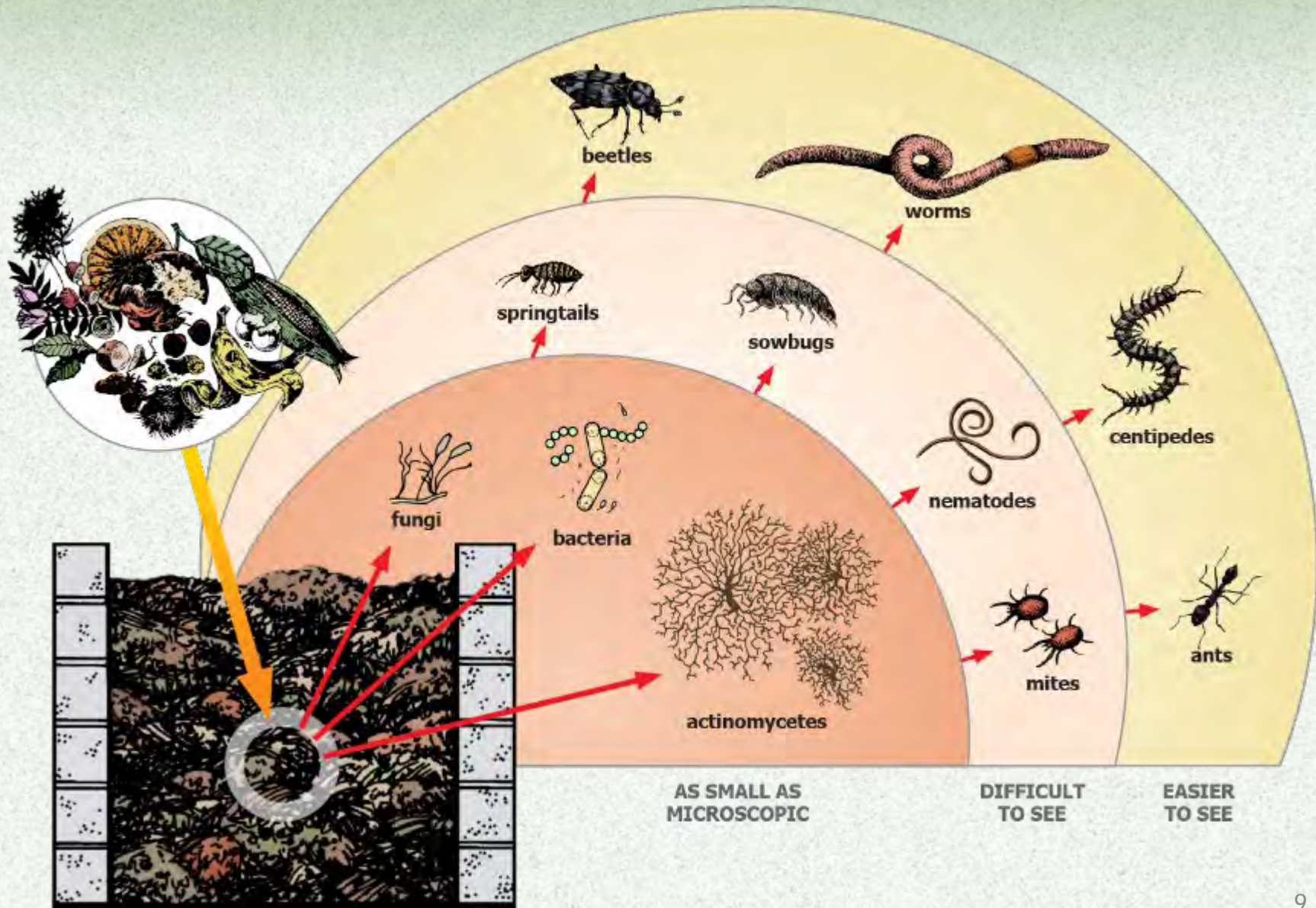
# One teaspoon of good garden soil to which compost has been added may contain:

- 100 million bacteria
- 800 feet of fungal threads





# Macroorganisms





# Needs for the composting process





# Acceptable materials – “food for decomposers”

- Leaves, grass clippings and yard debris
- Kitchen scraps: vegetable and fruit peels, coffee grounds and egg shells
- Used potting soil
- Most weeds and garden debris
- Paper and cardboard
- Sawdust, hay and straw
- Manure from herbivores
- Hair, fur and other natural fibers





# Compost pile “food” to avoid

- Persistent weeds: crabgrass and quackgrass, invasive species and weeds gone to seed
- Meat, dairy and oils
- Cat or dog waste
- Diseased plants
- Lime and ashes
- Treated lumber or sawdust





# Plant materials treated with pesticides

- Some pesticides can be persistent
- Some survive the composting process
- Can damage other plants





# Materials with special needs

These require additional consideration  
or limited volume added

- Pine needles
- Walnut leaves
- Sod





# Organisms need a balanced diet

– Carbon (C) and Nitrogen (N) –



Composting will be most rapid if the decomposers are fed a diet of carbon-rich and nitrogen-rich materials

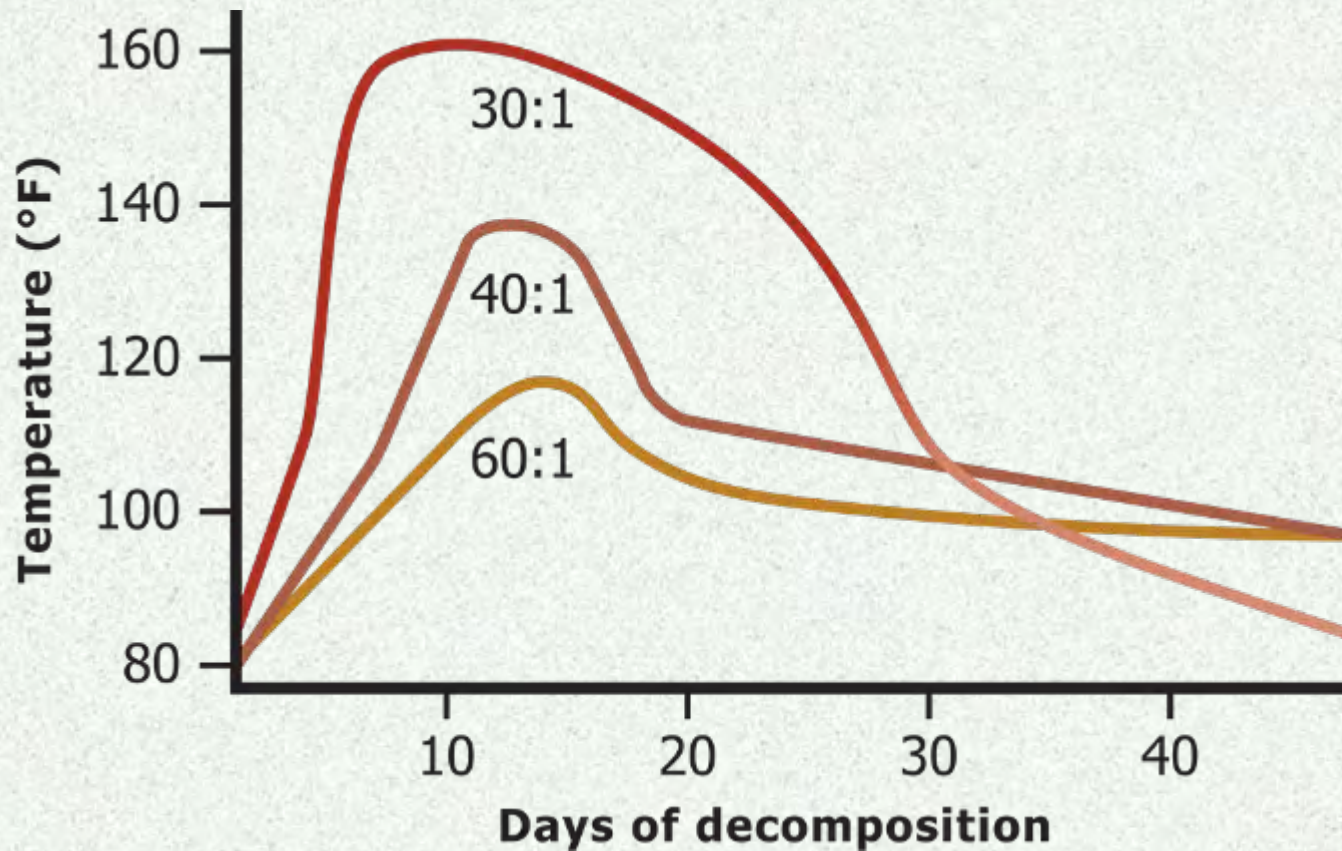
- Carbon-rich materials are known as “browns”
- Nitrogen-rich materials are known as “greens”

Rule-of-thumb is 2-3 browns for every green by volume





# Effects of Carbon:Nitrogen ratios on composting





## **BROWNS**

**Leaves**

**Straw**

**Paper**

**Sawdust**

**Animal bedding  
mixed with  
manure**

## **GREENS**

**Grass clippings**

**Vegetable scraps**

**Coffee grounds**

**Manure**

- Cow
- Horse
- Poultry
- Rabbit



## BROWNS

- Decay very slowly
- Coarse browns keep pile aerated
- Tend to accumulate in fall
- May need to stockpile until can be mixed with greens

## GREENS

- Decay rapidly
- Aerate poorly – may have foul odors if composted alone
- Tend to accumulate in spring and summer
- Supply nitrogen
- Best composting when mixed with browns



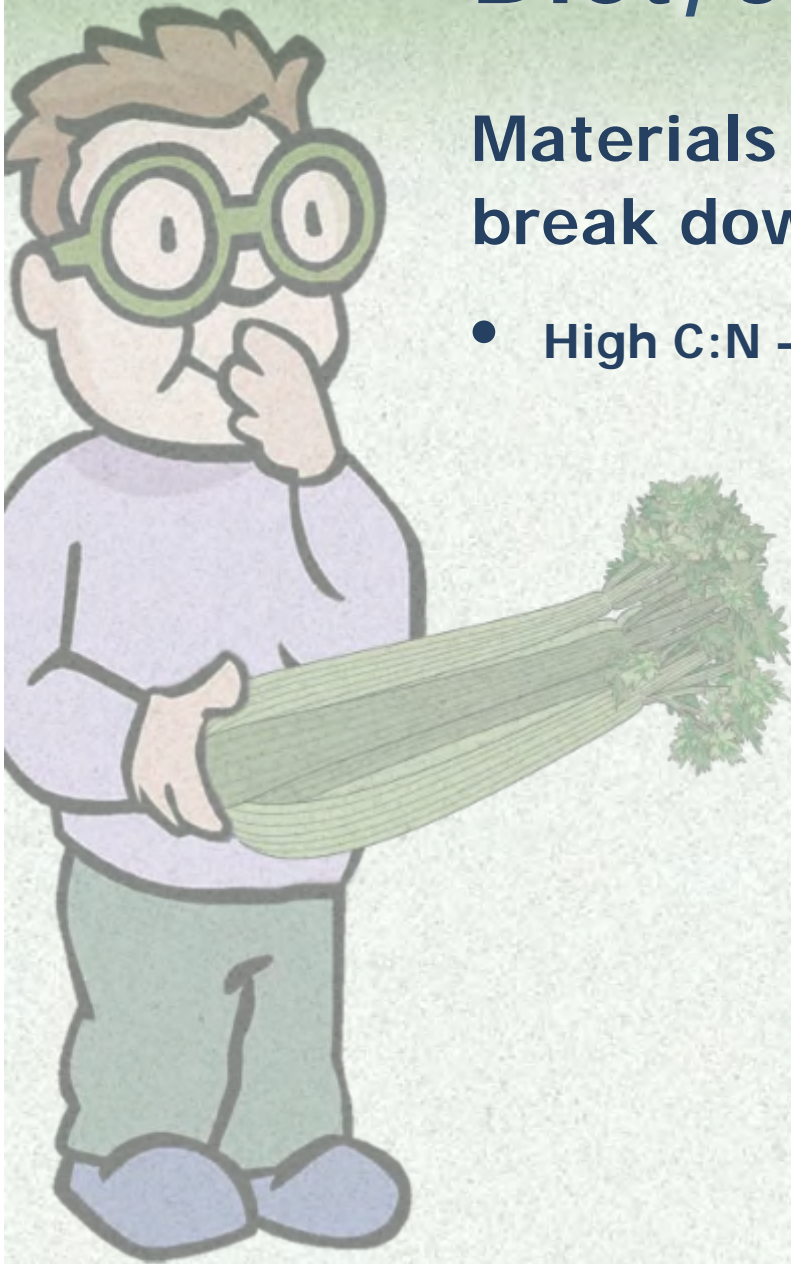
# Diet, continued

Materials high in carbon  
break down slowly

- High C:N – 30:1 and higher amounts of C

Materials that are  
too rich in nitrogen  
can lead to anaerobic  
conditions in the  
compost pile

- Low C:N – less than 25:1





# A final thought on C:N ratio

Mix two  
or three  
volumes

**BROWN**

to one of

**GREEN**





# Oxygen

A pile starved for air will become anoxic or even anerobic

- Oxygen acids and amines (stinky compounds)
- Aerobic activity stops

Compost pile is out-of-balance

- Food or water out-of-balance (low C:N ratio or pile is too wet)
- Too many greens



Three types of venting



# Particle size

Smaller particles have a greater surface area

Some larger particles are needed to maintain air flow

Particles create pore space within the pile

A compacted pile lacks the needed pore space





# Water

**Vital to support compost pile organisms**

**“Damp as well as  
wrung-out sponge”**

**40% to 60% moisture**





# Temperature

**90° – 140° is optimal**

**Temperatures above 130° can kill pathogens and weed seeds**

**Excessive temps (greater than 160°) can kill beneficial organisms**





# Does my compost have to get **hot**?

Good compost can be made in a pile that never gets hot, but

- Decay will be slower
- Not enough air, too little water or too many browns in the mix could all keep a pile from heating

High pile temperature provides the benefit of

- The most rapid composting
- Killing pathogenic (disease causing) organisms
- Killing weed seeds



# Pile size

**Pile should be about 1 cubic yard to maintain temperature**

- under 1 cubic yard is generally too small to reach temperatures above **130°F**

**Larger piles (greater than 3 cubic yards)**

- May prove difficult to turn
- Lack oxygen in pile center



# Choosing a compost strategy

## Hot piles

- Process takes about three months
- Plan ahead
- Store brown

## Cool piles

- Process takes one-half to two years
- Add materials as they accumulate
- Less effort





# Hot compost pile

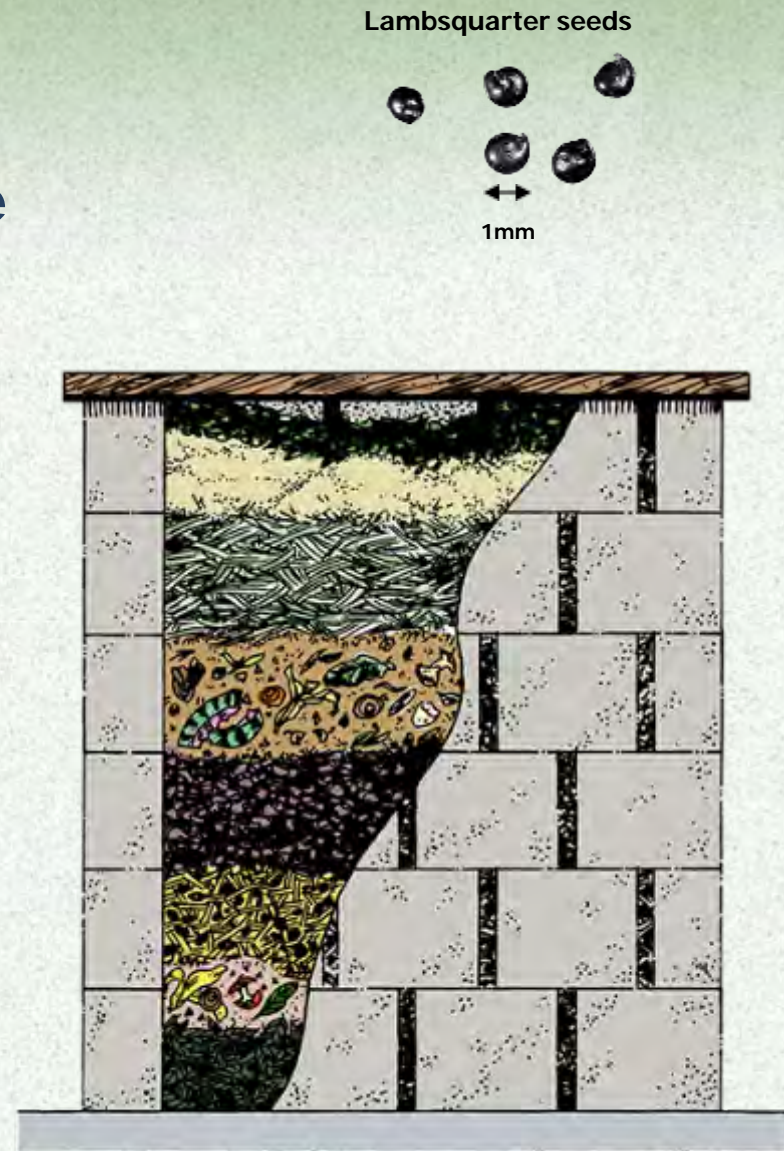
Pile built all at one time

Pile must be tended often

Compost in about 12 weeks

Benefits:

- Faster than cool method
- Reduces weed seeds





# Hot compost pile

Mix 2-3 volumes of **BROWNS** to 1 of **GREENS**

Water as you add materials

Turn pile:

- Weekly for first 4-6 weeks
- Bi-weekly for next 4-6 weeks
- Let cure (let stand without turning) for 4 weeks after pile begins to cool





# Cool and easy composting

Pile built as materials accumulate

Less intensive  
management

6 months to 2 years

Good method for  
kitchen scraps

Keep browns handy  
to cover

- Leaves
- Straw





# Pile turning tips

Mix materials from outside to middle

Open pore space

Use garden fork  
or shovel

Add water if needed

Commercial  
turning (mixing)  
tools for compost  
are available





# To bin or not to bin

**Composting does not require a bin, but be sure to select a method that will work for you**

- Compost heap, pile, trench and sheet may have aesthetic concerns
- Bins can be home-built or manufactured





# Examples of home-built bins



Wood/Wire



Concrete Block Three-Bay



All-Wood



Wood Pallets



Wire Mesh



# Examples of commercial bins



Orb



Home Composter



Tumbler



# Bin or pile location

Near where the compost will be used

Two feet or more from buildings

Good drainage

Away from wells

Be a good  
neighbor

Check local  
ordinances





# Troubleshooting

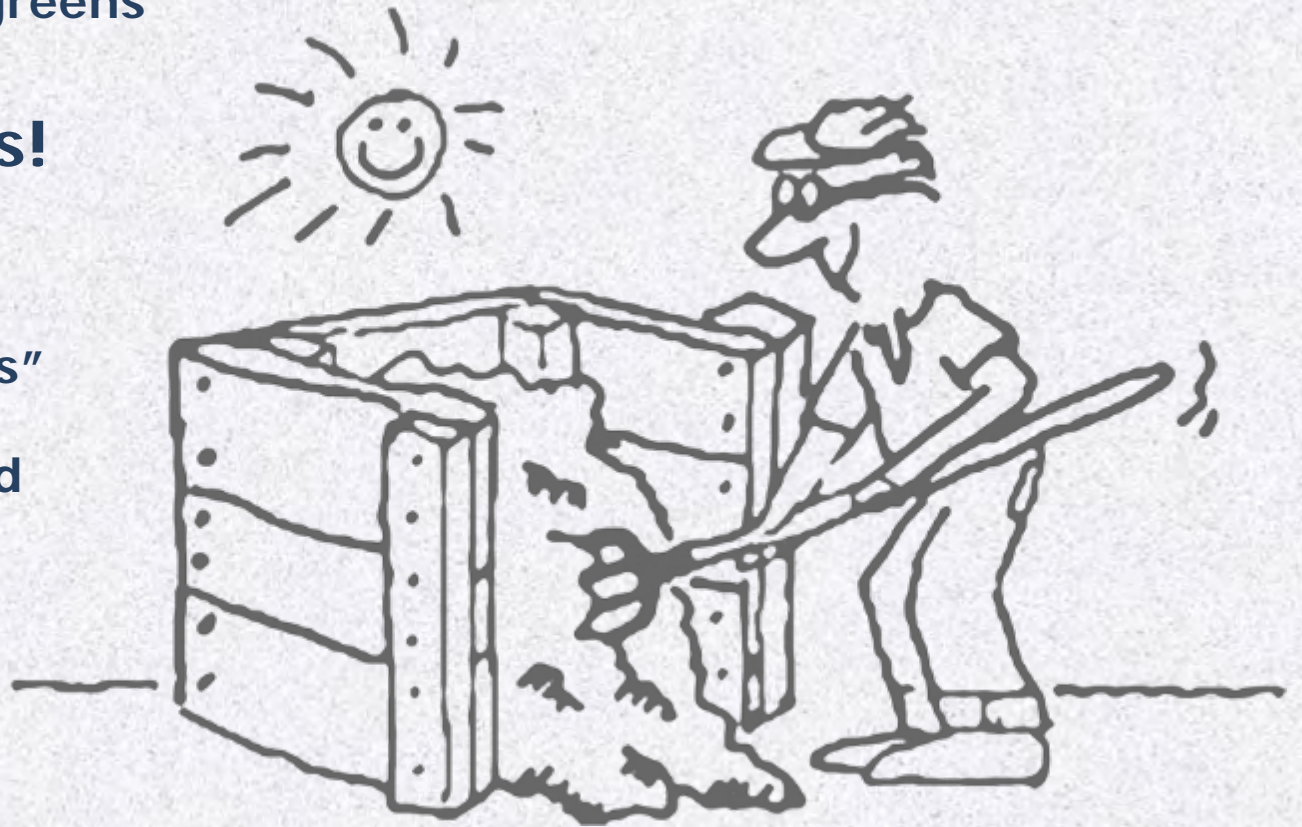
## Nothing is happening!

- Pile is too dry
- Not enough "greens"

## My pile stinks!

- Too wet
- Excess "greens"
- Pile compacted

## Pests





# Using compost

Gardens, flower beds, lawns and houseplants

- Clay soils – improves drainage and tilth
- Sandy soils – increases moisture holding
- All soils – improves soil structure
- All soils – adds nutrients: nitrogen, phosphorus, potassium and micronutrients





# When the composting process should be finished

Finished is also known as “mature” or “stable” compost


Compost is dark, loose and crumbly

Organic materials are unrecognizable

Ambient temperature







# Simple test for mature compost

## Germination test

- Will seed germinate in compost?
- Good test if using for potting soil

## Bag test

- Seal compost in a plastic bag for 5-7 days
- Should produce no foul odor





# Compost use continued

Unfinished compost can pull nutrients from the soil where it is placed

Compost can be screened

- Removes larger particles
- Necessary if used for top dressing





# Compost application rates

**2 inches mixed into top 6 to 8 inches of soil**

**Side-dress or mulch:  
1-3 inches**

**Top-dress lawns:  
up to ½ inch  
screen compost**



**Spreading compost on the Wisconsin State Capitol lawn**



# Composting key points

✓✓Balanced  
diet

✓✓Keep pile  
damp

✓✓Turn pile  
when you  
need to







This presentation was developed by Joe Van Rossum, University of Wisconsin-Extension, for use in Wisconsin's Master Composter program.

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