

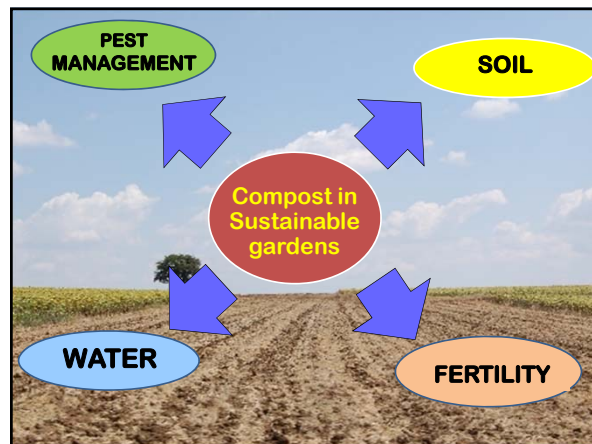
## Composting 101





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### Why compost?

- Composting diverts waste from our landfills, saving valuable space for non-recyclable waste.
- Compost improves soil structure and tilth.
- Holds moisture.
- Allows for water drainage.
- Slowly releases nutrients.
- Encourages beneficial microorganisms and suppresses soil-borne diseases.
- Replaces the need for commercial soil amendments and fertilizers.

**In short: It will improve the quality of your soil and enhance plant growth**

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### Where to compost?

- Home garden
- Community garden plot
- School gardens




### When?

At home you could compost year round  
 At a community garden plot, of course, Spring/Summer/Fall

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### Ingredients needed for composting



- **Greens**  
 Nitrogen rich, green, moist materials that will help provide heat for the decomposition process.
- **Water**  
 Creating a moist environment for organisms to thrive.
- **Browns**  
 Carbon rich, dry, woody materials.
- **Oxygen**  
 Micro-organisms need to breathe too!

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### Materials that can be composted?



- Vegetable & fruit scraps
- Coffee grounds
- Tea bags
- Egg shells
- Grass clippings
- Leaves
- Young weeds (that have not gone to seed)
- Pine needles




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### Browns (Carbon-rich)


- Fall leaves
- Dry grass clippings
- Paper/cardboard/newspapers
- Pine needles
- Old potting soil
- Food-soiled paper napkins/towels
- Stale flour, cereals, spices
- Paper based egg cartons

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### AVOID PUTTING IN

- Meat
- Dairy products
- Pet waste
- Clay kitty litter
- A lot of garden soil
- Weeds with seed heads



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### RECIPE

We need an adequate mix of high nitrogen (leaves, grass clippings, fruit/grain residues) and high carbon residues (branches, old grass, saw dust)

The Carbon to Nitrogen ratio (C:N) should be ~30:1 at the onset and finish between 15 to 20:1.

Roughly half of the carbon is lost as CO<sub>2</sub> in the process and the volume reduces to about 1/3 or less

Adequate oxygen is key for the pile to heat up and is provided by coarse chunks and adequate mixing

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1:2 Green to Brown

**One unit of "green" material (high nitrogen):**

- Grass clippings:
- Vegetable residues of all kinds and plant parts
- Fresh leaves

**Two units of "brown" material (high carbon):**

- Old leaves
- Wood pieces (1 to 4 inch in size):
- Saw dust
- Ground tree branches of all sizes

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## Structures for composting

A successful compost container can take on many forms. It can be either homemade or store purchased.



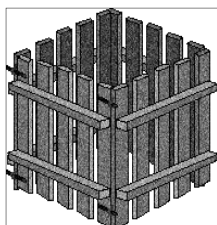
**Wooden Pallet system**



**Wire bin system**



**Pile height at least  
3 feet x 3 feet**



**Temperature of the compost pile**

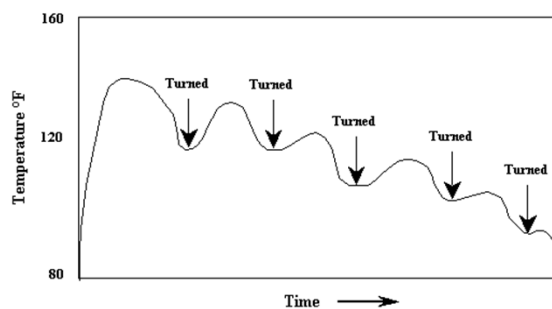
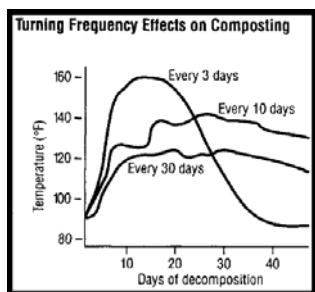


Figure 2. Typical temperature pattern in a turned compost pile.

**Turning frequency and pile temperature**



**Which item takes up most of our garbage out of these three options**

- ✓ 1. Paper
- 2. Diaper
- 3. Plastic soda bottles

**A class exercise**

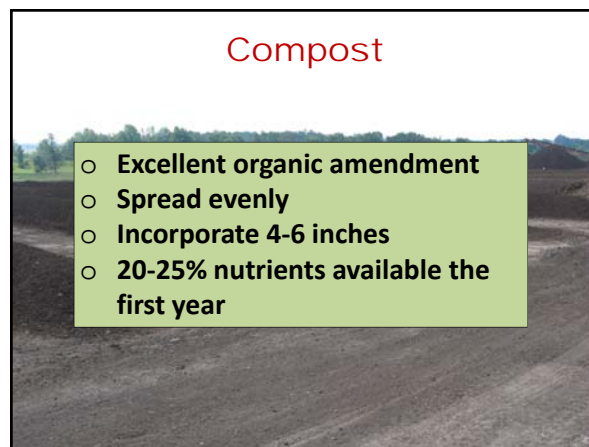
- 2 bales of straw
- 2 bales of hay
- Finished compost
- Horse manure
- Saw dust
- Food waste from student cafeteria
- Peat

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**Temperature log**

| Date | Time      | Temp |
|------|-----------|------|
| 2/17 | 11:00 AM  | 65   |
| 2/17 | 6:00 pm   | 70   |
| 2/18 | 8:00 am   | 118  |
| 2/18 | 8:00 am   | 118  |
| 2/18 | 11:45 AM  | 160  |
| 2/18 | 2:00 pm   | 160  |
| 2/18 | 11:35 am  | 160  |
| 2/18 | 7:30 pm   | 157  |
| 2/18 | 3:00 pm   | 155  |
| 2/18 | 2:30 am   | 156  |
| 2/18 | 12:00 am  | 155  |
| 2/17 | 1:15 am   | 140  |
| 2/17 | 1:00 pm   | 140  |
| 2/17 | 2:47 pm   | 140  |
| 2/18 | 11:50 am  | 138  |
| 2/21 | 10:00 am  | 130  |
| 2/22 | 2:30 pm   | 127  |
| 2/24 | 10:20 am  | 124  |
| 2/25 | 10:20 am  | 122  |
| 2/28 | 8:50 am   | 118  |
| 2/28 | TUE 11:30 | 75.6 |
|      | 5:00 pm   | 63   |
| 3/1  | 4:00 am   | 70   |
|      | 2:30 pm   | 75   |
| 3/2  | 8:00 am   | 108  |
| 3/2  | 3:00 pm   | 121  |



**Troubleshooting**

**Symptom:**  
The compost pile has a bad odor.

**Problem:**  
Pile is too wet and there is not enough oxygen.

**Solution:**  
Turn the compost and add dry brown materials.

**Troubleshooting**

**Symptom:**  
The pile fails to heat-up.

**Problem:**  
Compost pile is too small.

**Solution:**  
Collect more material and mix into pile.

### Troubleshooting

**Symptom:**

The center of the pile is dry.

**Problem:**

Not enough water.

**Solution:**

Chop up any coarse material remaining in the pile, add green material, moisten and turn pile.

### Troubleshooting

**Symptom:**

The compost pile has a bad odor.

**Problem:**

Pile is too wet and there is not enough oxygen.

**Solution:**

Turn the compost and add dry brown materials.

### Analysis of compost

1. Nitrogen
2. Phosphorus
3. Potassium



ISU SOIL TESTING LAB

<http://www.agron.iastate.edu/soiltesting/>

### Compost nutrient levels

| Manure type    | Nitrogen           | P       | K   |
|----------------|--------------------|---------|-----|
|                | % dry weight basis |         |     |
| Dairy manure   | 1-2                | 0.5-1.5 | 1-2 |
| Feedlot manure | 2-3                | 1-1.5   | 1-2 |
| Poultry manure | 2-4                | 1-3     | 1-3 |
| Crop residue   | 1.5-2.5            | 0.2-0.5 | 1-2 |



## Many Thanks

Brandon Carpenter  
Dana Jokela  
Ray Kruse  
Jennifer Tillman  
Kristine Neu  
John Krzton-Presson

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### Updates:

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