4 Season Composting

Brian Rosa
BE New Organic World & The WORMERY at Vermicycle Organics
4 Season Composting

4 Things That Make Compost Happen

Brown (carbon)  Water (H2O)
Green (nitrogen)  Air (oxygen)
Carbon/Nitrogen Ratio

For microorganisms, carbon is the basic building block of life and is a source of energy, but nitrogen is also necessary for such things as proteins, genetic material, and cell structure.
C:N Ration 30:1 optimum

<table>
<thead>
<tr>
<th>Brown (Carbon)</th>
<th>Green (Nitrogen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaves</td>
<td>Food Scraps</td>
</tr>
<tr>
<td>80:1</td>
<td>15:1</td>
</tr>
<tr>
<td>Straw</td>
<td>Grass Clippings</td>
</tr>
<tr>
<td>90:1</td>
<td>17:1</td>
</tr>
<tr>
<td>Sawdust</td>
<td>Fruit Waste</td>
</tr>
<tr>
<td>500:1</td>
<td>40:1</td>
</tr>
<tr>
<td>Wood chips/twigs</td>
<td>Weeds</td>
</tr>
<tr>
<td>700:1</td>
<td>20:1</td>
</tr>
<tr>
<td>Paper/Cardboard</td>
<td>Chicken Manure</td>
</tr>
<tr>
<td>175:1</td>
<td>7:1</td>
</tr>
</tbody>
</table>
Brown or Carbon

Brown and woody material
- Leaves
- Straw
- Saw dust
- Wood chips
- Paper products
- Corn Cobbs

2 parts carbon (brown)
Green or Nitrogen

1 part nitrogen (green)

Green or Nitrogen
Food Scraps
Weeds
Manure
Silage
Spent grain or hay
Coffee Grounds
Critical Mass

Minimum 3 ft. X 3 ft. X 3 ft.

Pile large enough to insulate and maintain temperature

Pile small enough to allow adequate oxygen penetration
Moisture
50 % - 60 % Optimum

Damp - feel like a wrung out sponge

Squeeze Test - squeeze a handful

Should stay together

If water drips out – too wet !

If crumbles – too dry !
Air / oxygen - turn or aerate, particle size for porosity

Bulk Density: 900 lbs. – 1000 lbs. per cubic yard

Speeds up the composting process

Re-heats pile to keep it in aerobic state

Creates pathways for air & moisture to circulate

Eliminates odors

Takes care of most composting problems
Compost in 1-3 months

Create a recipe that works for you!

What materials are available?

Remembering you need 2 – browns, 1 green. (by volume)

Start with a layer of course materials (stalks, twigs, straw)

Then alternate layers of brown & green materials, adding a shovel full of soil/compost and moistening every other layer

Repeat this layering and moistening until bin is full or critical mass
Hot fast – batch compost pile

Compost in 1-3 months

Monitor the temperature of the pile

Within 24 hours, pile should be 120 – 130 F

After 3 days at 131 F (55 C), turn pile – the core of pile is finished
Time and Temperature (PFRP) (NOP)
  Windrow – Turn 5 times 15 days
  In-vessel – 3 Days above 131 F (55 C)

* Check temperature by thermometer or place your hand in the middle of pile.
3 Bin System
Aerated Piles
Turned Static Piles
Aerated Static Piles
Vermicomposting – Flow Through System
Vermicomposting – Beds
Equipment & Accessories

Windrow Grinder Mixer
Equipment & Accessories
Pitchfork
Thermometer
Bobcat, frontend loader
Composting Greenhouses

Utilizing btu’s (heat) generated
Simple and can be utilized in many applications

Heat Recovery
Trouble shooting

Odors
Sulfur smell (anaerobic) – aerate/stir/mix

Ammonia smell – too much nitrogen, add carbon

Cold - too wet or too dry, not enough nitrogen or oxygen
Field Application of Compost

Cubic yards per acre for various depths of applications

<table>
<thead>
<tr>
<th>Depth of application (inches)</th>
<th>Cubic yards per acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4”</td>
<td>34</td>
</tr>
<tr>
<td>3/8”</td>
<td>50</td>
</tr>
<tr>
<td>½”</td>
<td>68</td>
</tr>
<tr>
<td>1”</td>
<td>135</td>
</tr>
<tr>
<td>2”</td>
<td>270</td>
</tr>
</tbody>
</table>
Vermiculture & Organic Waste Solutions:

BE New Organic World
beneworganicworld.com
Brian Rosa
brianbenow@gmail.com
810.252.8303