COMPOSTING GOWANUS!

A Guide to Building a Compost Windrow
COMPOSTING GOWANUS!

New York City generates more than 2,300,000 tons of food waste a year*. By composting, we can reduce the amount of waste entering landfills, recycle minerals and nutrients, and support a more sustainable food system. Our volunteers and staff help build and maintain our compost windrows at the Gowanus Canal Conservancy, where we recovered more than 100,000 lbs of food scraps a year and convert them into nutrient-rich compost.

A majority of our composting ingredients are sourced within a 3 mile radius from the GCC. Our partners at GrowNYC Greenmarket, Department of Parks and Recreation, various schools, organizations and local businesses provide us with the labor and the base of “greens” and “browns” for our compost windrows.

**ACCEPTABLE GREENS:**
- Fruit & Vegetable Waste
- Coffee Grounds & Filters
- Grains & Flour Products
- Tea Bags
- Egg Shells

**ACCEPTABLE BROWNS**
- Yard Trimmings
- Untreated Sawdust & Woodchips
- Pine Needles
- Newspaper

**AVOID:**
- Meats, Poultry, & Fish Waste
- Pressure-treated Wood
- Dairy Products
- Fats & oils
- Glossy, Colored Paper
1.1 GETTING STARTED

In order to build our compost windrows, we first gather the necessary ingredients and tools. Because windrows are at a larger scale than DIY composting units, we delegate different roles to our staff and volunteers to facilitate a more efficient building process. At the Conservancy, we can build a compost windrow in 2 hours with approximately 25 volunteers.

1.2 TOOLS & MATERIALS

+ 1 Part Food Scraps ("Greens")
+ 1 Part Wood Chips ("Browns")
+ 1 Part Sawdust OR Leaves ("Browns")
+ Wheelbarrows, bins
+ Pitchforks, Spades & Garden Rakes
+ Gloves
+ Finished Compost (Enough to Cover Entire Windrow)

Conversions:

Because we obtain our inputs from multiple sources, they arrive in different units of measurement. Below are some conversions we use when calculating the windrow footprint in steps 2 and 3.

- 1 cubic yard (CY) ~ 850 lbs (greens)
- 1 cubic yard (CY) ~ 200 gallons
- 1 cubic yard (CY) = 27 cubic ft

1.3 ROLES/TASKS

Project Manager: Ensures quality control, delivers proper instructions, and maintains correct sequential layering of compost; adjusts recipe as needed.

Green Waste Input Crew: Transports food scraps to the compost pile and ensures that the “recipe” is properly observed; verifies food scraps are in contact with browns.

Green Waste Chopper Crew: Chops larger food scraps with a flat-edge spade and shovels smaller pieces back into the windrow.

Brown Waste Input Crew 1 (Wood chips): Transports wood chips to the compost pile and ensures that the “recipe” is properly observed; caps windrow with finished compost.

Brown Waste Input Crew 2 (Wood Shavings or Leaves): Transports wood shavings OR leaves to the compost pile and ensures that the “recipe” is properly observed.

Cleaner: Cleans and stacks excessively dirty wheelbarrows, bins, containers used to transport inputs.
2.0 DETERMINING VOLUME OF GREENS & BROWNS

We begin by calculating the amount of materials we have which will inform us of the footprint of the windrow. From our experience at the Gowanus Canal Conservancy, we have discovered over the past year that our frozen veggies weigh 850 lbs per cubic yard.* Therefore, when we receive a truck load that weighs 8,500 lbs we can approximate that there are 10 cubic yards of scraps. Note that these calculations are only for the greens.

![Diagram of 850 lbs of greens and 1 cubic yard of volume]

*Food scraps often arrive frozen because many folks find their freezer to be the best place to store food wastes in order to avoid any unpleasant odors.

3.0 DETERMINING WINDROW FOOTPRINT

After determining the volume of greens and browns, we can estimate an appropriate windrow footprint. Our windows are typically 8 ft wide, 4 ft in height, with a varying length (x) depending on the amount of material we receive. We have found that these are optimal dimensions that allow multiple conservancy volunteers to layer and turn our windrows without the use of heavy machinery. If we have 7 CY of greens and 14 CY of browns, we would end up with a windrow length a bit over 20ft. **The greens to brown ratio should be 1:2, respectively.**

**Finding Windrow Length (X)**

\[
\left(\text{CY of greens}\right) + \left(\text{CY of browns}\right) \times 0.8 = Y \, \text{CY} \\
\left(\frac{Y \, \text{CY}}{0.778 \, \text{CY/ft}}\right) = X \, \text{linear ft}
\]
4.0 WINDROW LAYERING

Now that we’ve determined the windrow footprint area and volume, we can begin the layering process. Because the windrow tapers as its height increases, each layer will require less material over time. However, the proportion of wood chips to sawdust/leaf litter to food waste remains the same per layer.

RECIPE:

The amount of materials per layer can vary depending on the length of the windrow. There is no set formula but from our past experiences, we use the ratios below to guide how much material we need. For our 8’ x 4’ x 20’ windrows, we estimated that we would need 200 gallons for the first layer. However, the nature of the materials can vary greatly depending on the source. In our case, we adjusted the quantities of the materials of the first layer to 250 gallons. A good rule to follow: the greens layer should just be thick enough that each food scrap is in contact with a layer of browns.

<table>
<thead>
<tr>
<th>Materials Ratio / Layer</th>
<th>8’ x 4’ x 20’ Windrow</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LAYER</strong></td>
<td><strong>RATIO</strong></td>
</tr>
<tr>
<td>1</td>
<td>10 units of each material</td>
</tr>
<tr>
<td>2</td>
<td>9 units of each material</td>
</tr>
<tr>
<td>3</td>
<td>8 units of each material</td>
</tr>
<tr>
<td>4</td>
<td>7 units of each material</td>
</tr>
<tr>
<td>5</td>
<td>6 units of each material</td>
</tr>
<tr>
<td>6</td>
<td>5 units of each material</td>
</tr>
<tr>
<td>7</td>
<td>4 units of each material</td>
</tr>
</tbody>
</table>

RATIOS/LAYER

1 part food waste
1 part sawdust/leaf litter
1 part wood chips
5.0 CAP & BERM

After we finish layering our greens and browns, we blanket the windrow with 2” of finished compost. This acts as a bio-filter and inoculates the pile with some odor-eating bacteria. In addition, this deters rodents and keeps the windrow looking like a pile of dirt and not a pile of food. **Ideally, the compost cap should cover all parts of the pile** but some compost will cascade down leaving thin spots along the side.

Over time, leachate (food juice) may percolate down, especially if there is not enough browns in the windrow. A berm around the windrow will help catch this liquid and help neutralize the smell. The dimensions of the berm will vary depending on the source materials (and how much leachate is produced).
**6.0 TURNING**

Following the cap & berm stage, we let our compost windrow rest for two weeks. During this period, microbial activity and temperature increases exponentially, breaking down easily digestible sugars and starches followed by more complex compounds such as cellulose and lignin in the later weeks. To ensure that these beneficial bacteria and microorganisms are maintained, **we turn (or mix) our windrow typically after two weeks** before the core temperature rises to 160 degrees F. Following the initial turning, **we continue to mix our compost windrow once a week for 5 weeks.** Notice the drop in temperature which occurs after every windrow turning event. This ensures proper aeration and even distribution of moisture and heat in our compost windrows that facilitate good microbial health. Stimulating aerobic bacterial activity also prevents the pile from stagnating and smelling rancid.

![Windrow Temperature-Time Relationship (June - July 2013)](image)

**7.0 SIFTING**

After the compost has gone through 5 weeks of decomposition and 2 weeks of cooling. All of the greens have broken down, but there is still a large amount of browns. This grade of compost can be used for landscaping projects, but for smaller scale projects, a finer grade of compost should be applied. The compost should be sifted through a ¼ inch wire mesh, filtering out all the large woody material, called “overs.” These overs will be reincorporated into a new windrow, as they take longer to break down. **The compost that falls through the mesh is finally ready for use!**