City of Columbia
Volunteer Programs
Compost Workshop

With Trish Woolbright
 Volunteer Workshop Instructor

We Are Not Trash
Benefits of Recycling Organics and Using Compost

- Increase soil health
- Reduce pesticide and chemical use
- Reduce in soil-borne and other plant diseases
- Reduce methane emissions from landfills
- Composting offers a significant answer to climate change relief

CAAP
City of Columbia's Climate Action and Adaptation Plan

Energy
Housing, Buildings & Development
Transportation
Health, Safety & Well-Being
Waste
Natural Resources

WWW.como.gov/sustainability/climate-action
Why compost?

- Reduce your household waste & less smelly trash
- Reduce landfill waste
- Reduce methane production
- Environmental benefits
- Economic benefits
- Exercise, get outside
- Transform something of little value into something valuable

Myth Busting

- **Composting is time consuming**
  - Set up your systems and it's no time at all.
- **Composting is gross / smelly**
  - Fix the smell with our troubleshooting tips! It just needs balance.
- **PESTS! (large and small)**
  - Control for this with a good system design and following the guidelines.
- **You have to follow a recipe**
  - There are many recipes out there, but following a couple, simple rules is all that is needed
Choosing your Style

System Pros and Cons

<table>
<thead>
<tr>
<th>Bins</th>
<th>Piles</th>
<th>Tumblers</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Neat</td>
<td>+ Free</td>
<td>+ Easy to Empty</td>
</tr>
<tr>
<td>+ DIY or buy it</td>
<td>+ Easy to stir and sift</td>
<td>+ Cuts down on odor and flying insects</td>
</tr>
<tr>
<td>+ Holds heat</td>
<td>+ Easy to relocate</td>
<td>+ Looks good</td>
</tr>
<tr>
<td>+ Protects from most pests</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Have to build or buy it</td>
<td>- Messy Looking</td>
<td>- Pricy</td>
</tr>
<tr>
<td>- Out of sight, out of mind</td>
<td>- Not protected from rodents or pests</td>
<td>- Hard to turn when ½ full</td>
</tr>
<tr>
<td>- Rodents can dig under it</td>
<td>- A crotchety neighbor may complain about it</td>
<td>- Turns to sludge if too green</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Not as many beneficial microbes</td>
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Choosing a Location

Dos:

- Partially shady spot: compost will roast in the sun and dry out, too much shade can slow the process.
- Must have bare ground underneath to help with drainage
- Easy access from kitchen: garden and water source

Don’ts:

- Put it right next to your house or against a wall
- Put front and center. It can be unattractive at times!
- Put in a location that will affect neighbors and give the crotchety ones something to complain about

How Much Stuff?

2 Carbons (Brown stuff) : 1 Nitrogen (green stuff)
Browns

- Dried leaves
- Dried grass clippings
- Dead house plants
- Pruning and cuttings (helps create air pockets)
- Pine and spruce needles
- SMALL amounts of saw dust
- Straw
- Egg Shells
- SMALL amounts of wood ash

Greens

- Vegetable kitchen scraps
- Coffee grounds
- Garden waste (weeds, grass clippings)
- Flowers
What to Keep Out of the Compost Pile

- Chicken
- Milk
- Lard
- Cigarettes

Building the pile

- Should be about 3’ x 3’ x 3’
- 1 cubic yard will finish in a few months
- Smaller piles won’t heat up enough to kill seeds and will take longer to break down
- Too big a pile will be too difficult to stir
- Typical ratio: 2 parts Carbons/Browns to 1 part Greens/Nitrogen
- Smaller pieces compost faster - cut up kitchen scraps
What the pile needs

- **Food**: Nitrogen and Carbon from green and brown waste
- **Water**: Add water so that it feels like a wrung out sponge
- **Air**: Aerobic processes needs air (stir it)

Meet the workers
Managing the pile

**Heat:**
Kills seeds & pathogens, makes it decompose faster
Ideal temperature 120-150°- proper size pile
and amounts of greens and browns

**Moisture:**
Should be crumbly but moist like a wrung out sponge

**Feed, water, stir**

**From plate to pile:**
- Keep a container with lid in your kitchen
- Have a garden fork or shovel handy at the pile- turn and **cover greens** with brown material
- Keep a pile of browns (leaves, straw, cardboard, horse bedding) near the pile

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<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unpleasant Odor</td>
<td>Too much nitrogen</td>
<td>Add high carbon materials - leaves, straw, pine needles, cardboard</td>
</tr>
<tr>
<td></td>
<td>Compaction</td>
<td>Aerate</td>
</tr>
<tr>
<td></td>
<td>Overwatering</td>
<td>Add dry leaves to soak up water and aerate</td>
</tr>
<tr>
<td>Pile not heating up</td>
<td>Lack of nitrogen</td>
<td>Add nitrogen such as green grass clipping, kitchen scraps, coffee grounds, manure or blood meal</td>
</tr>
<tr>
<td></td>
<td>Pile needs to be turned</td>
<td>Mix pile- bring outside material to the center</td>
</tr>
<tr>
<td></td>
<td>Low moisture</td>
<td>When watering, make sure the moisture gets to the center of the pile</td>
</tr>
<tr>
<td></td>
<td>Compost is finished</td>
<td>Finished compost smells earthy not rotten or moldy and its dark and crumbly</td>
</tr>
<tr>
<td>Compost is damp and only the center is warm</td>
<td>Pile is too small</td>
<td>Add more compost material</td>
</tr>
</tbody>
</table>
Pests

- Animals getting in
  - Use a bin with a lid
  - Don’t put in meat and bones!

- Flying pests
  - Cover with more browns

Using Your Compost

- Compost is done when it is crumbly and brown
- Clue: if you can tell what is in your compost, it’s not done
- You can pick out the big stuff and put it back in the pile or into another pile

Use for...
- A two inch layer around new plantings
- Mulching for landscaping
- Potting Soil for seedlings
- Mix with potting soil when repotting
- Yard dressing
Vermicomposting

- If you don’t have a yard or space for hot composting
- Done in a bin/s
- 1 cubic foot of space for each pound of food waste
- Red wigglers worms, not earth worms

Vermicomposting

- Worm’s specialized digestive system converts food waste and other organic materials to a nutrient-rich compost
- Indoors- pantry, utility room, under a table or desk, basement, garage
- Outdoors- prefer temps 55°-77°, north side of house or shed better. Keep out of wind and rain
- Bedding- shredded newspaper, shredded corrugated cardboard or straw. NO glossy paper
Compost Basics

COMPOST HAPPENS! This decomposition process happens slowly on forest floors, in prairies and even in our own backyard. But we want to SPEED UP the process in order to:

- Get rich compost faster to feed our gardens, lawns, trees and shrubs
- Save money by reducing the need to buy peat moss and fertilizers and
- Reduce the amount of yard materials set out at the curb or taken to municipal drop-off sites, which costs us all money!

The Muscle of Micro-organisms

Bacteria are the workhorses of the compost pile. They are present on leaves, grass and other yard materials, and even in the air! They start the break down process so larger decomposers can finish the job.

Keep Microbes Happy and they will make compost much faster! The bacteria multiply, give off heat and all those hungry mouths begin to change yard materials into black gold compost. Bacteria need the same things people do: Food, Water and Oxygen.

FOOD: To make compost you need a balance of:

| Carbon (brown dried plant material) | Nitrogen (green plant material or other nitrogen) |

Mix equal weights of browns and greens. Carbon is the carbohydrate energy that bacteria need. Nitrogen builds proteins needed for new cells walls.

WATER: Compost piles need to be kept as damp as a wrung-out sponge. Too dry and the bacteria die off. Too wet and they drown. Water your pile well as you build it, when you turn it and while it is just sitting there. Rain water helps but is usually not enough!

OXYGEN: Turning your compost pile adds needed oxygen and speeds up decomposition. Oxygen-loving aerobic bacteria keep a compost pile cooking and smelling like an earthy greenhouse. Reduce the oxygen and the decomposition slows down, anaerobic bacteria increase and odors can develop. Turn the compost with a pitchfork. If using a portable bin, remove the bin and set it up next to the remaining pile. Transfer the composting material into the now empty bin. This works much better than stirring compost in the bin.

Feel the Heat!

There are 3 ways basic ways to compost:

1. Hot, fast piles: should be built all at once, turned every 3-5 days for the first couple of weeks and kept damp. Hot piles kill weed seeds and most diseases, ONLY if the pile stays at 130-140 degrees for 5-10 days. Then it will naturally cool down and other bacteria and larger decomposers will move in. Depending on how often you turn and water the pile you may get compost in 6 weeks to 12 months.

2. Cool, slow piles: are built as you generate the materials and never really heat up much. However, compost does happen. This method takes about 1 year to get compost off the bottom and up to 2 years to get a whole batch. Weed seeds and diseases will not be killed with this method.

3. Trench composting: Dig yard materials or kitchen scraps right into the soil. Be sure to cover the materials well. This adds organic matter to the soil but also robs it of nitrogen.
Macro organisms

Fungus, actinomycetes (gray, cobwebby growth), nematodes, mites, springtails, centipedes, sow bugs, ground beetles and earthworms are all normal critters that help you make compost faster. They like a good lunch and will find your pile (be sure to set any compost materials directly onto the grass or soil; never on concrete or asphalt).

Compost Bins

A bin is not required, but it really helps in backyard composting. Compared to heaps, bins are more attractive, use vertical space better and get you more organized. It is much easier to turn a bin worth of compost than tackling a big heap.

Bins should be:
- about 3 ft x 3 ft in size to hold the heat
- near a water source so a hose can easily reach
- convenient for you, near a house or garden
- in either sun or shade – go with convenience
- have enough space to turn the bin (limited space? Use a tarp or cart to turn compost on, and then return to bin)
- 2 ft from a building to allow air circulation

What may be added to compost?

<table>
<thead>
<tr>
<th>For best results add equal weights of Green &amp; Brown materials</th>
<th>Green  @ (nitrogen)</th>
<th>Brown ≈ (carbon)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass clippings:</td>
<td>≈</td>
<td>Egg shells:</td>
</tr>
<tr>
<td>Leaves:</td>
<td>≈</td>
<td>Coffee grounds, food scraps</td>
</tr>
<tr>
<td>Weeds/garden debris:</td>
<td>≈</td>
<td>(must bury in pile):</td>
</tr>
<tr>
<td>Small amts. brush, twigs:</td>
<td>≈</td>
<td>Hay:</td>
</tr>
<tr>
<td>Small amts. wood ash:</td>
<td></td>
<td>Manure from plant eaters:</td>
</tr>
<tr>
<td>Small amts. sawdust / wood chips</td>
<td>≈</td>
<td>Potash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fur/hair, natural fibers, feathers:</td>
</tr>
</tbody>
</table>

What should NOT be added to compost?

- Meat, bones, fat, dairy products, oils (cooking & salad), whole branches, logs, pet or human waste, charcoal briquette ash, sawdust from treated wood, diseased plants (unless fast composted), persistent weeds (quack grass), thorny branches.

Fast Track Composting

1. Make a thin layer (optional) of coarse organic material (sticks, corn stalks, dried stems).
2. Layer approx. equal weights of brown (carbon) & green (nitrogen) yard materials.
3. Water each layer as pile is built.
4. Finish with brown layer of dried plant material. Chopping materials first speeds up composting (use a lawnmower, shredder or machete). Optional: add an inch of soil or finished compost after each layer of brown and green to add extra microorganisms to help the process, but it isn't necessary because yard materials have enough microbes.
5. Turn pile every week or two to add oxygen.
6. Water layers of pile as it’s turned, keeping it as damp as a wrung-out sponge.
7. Finished compost takes between 6 wks. and 12 months, depending on how often you turn and water the pile. Mixing equal weights of brown and green yard materials is important for faster composting.

**Laid Back "No-turn" Composting**

1. Make a thin layer (optional) of organic material like sticks, corn stalks, dried plant stems.
2. Add yard materials as they accumulate.
3. Water the pile as you build it, keeping it as damp as a wrung out sponge.
4. Turn pile occasionally or not at all.
5. Some finished compost will be ready in 12 - 24 months. The bottom and center of pile will be dark, crumbly ready. The un-composted material can be used to start a new pile.

**Trouble-Shooting**

<table>
<thead>
<tr>
<th>PROBLEM:</th>
<th>SOLUTION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too Dry: Dry or crackles to touch.</td>
<td>Add water: keep pile as damp as a wrung out sponge.</td>
</tr>
<tr>
<td>Too Wet: Soggy, may smell.</td>
<td>Turn pile to add oxygen. Discontinue watering until pile is as damp as a wrung out sponge. Add carbon source/dry material.</td>
</tr>
<tr>
<td>Contains meat, fat, salad oil: Pile is matted, smells, attracting varmints</td>
<td>Remove meat, fat or materials with salad oil. Turn pile add good material sources.</td>
</tr>
<tr>
<td>Anaerobic: Smells bad</td>
<td>Needs oxygen, turn pile</td>
</tr>
</tbody>
</table>

**Uses for Compost**

- Soil Additive: dig in or side-dress plants.
- Mulch: 2-3 inches around flowers, vegetables, trees and shrubs.
- Mix in potting soil: see recipe below.
- Lawn Top Dressing: screen with 1/2 inch hardware cloth attached to wooden frame.
- Compost Tea: soak bag of compost in water, stir often. Use to fertilize yard, garden, houseplants.

**Potting Soil Recipes**

Recipe #1: 2 parts good garden loam  
1 part fine, sharp sand  
1 part finished, mature compost (no more than 33%)

Recipe #2: 2 parts soil less mix  
1 part finished, mature compost (no more than 33%)

Recipe #3: 1 part peat  
1 part perlite  
1 part compost (no more than 33%)
How To Build A Vermicomposting Bin

Materials:

1 newspaper, packing paper OR enough straw to cover bottom of bin with 3".

Scissors or paper shredder (if using newspaper for bedding)

1 plastic tub and matching lid (dark colored, opaque, and with handles)

1 drill with 1/8 inch drill bit

Clean spray bottle filled with water

Step 1: Skip this step if using straw for bedding. Using scissors, cut newspaper or packing paper into 1/2" wide strips. Set aside.

Step 2: Carefully, drill 1/8" air holes around the top perimeter of the bin, as shown. Then, drill another dozen air holes in the lid of the bin.

Step 3: Fill tub with shredded newspaper, packing paper or straw to 3" deep. Moisten with spray bottle until the bedding has the dampness of a wrung-out sponge.

You are now ready to add your worms and food. Happy Composting!