

Composting 101 – July 2, 2020

Online Class Outline with Resource Links

Today's Topics

- What is compost
- How to make compost at home
- What to look for when buying compost
- How to best use compost around your home and garden

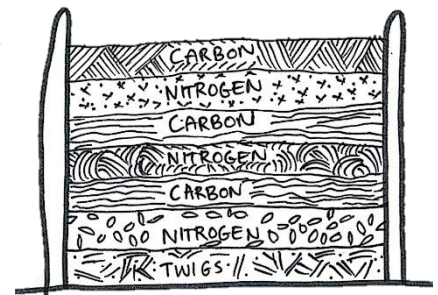
Review: Great Soil → Healthy Plants

- Healthy soil has good “structure” which means:
 - Lots of air pockets – don’t walk on your soil if you can help it.
 - Workable.
 - Retains moisture and allows good drainage.
 - Contains ample organic matter.
- Low quality soil has bad soil structure.
 - Compacted – Try not to walk on your soil.
 - Contains zero or low levels of organic matter.
- Organic matter is key
 - O.M. is previously living plants and insects, i.e. leaves, straw, mulch, compost.
 - Organic matter feeds soil microbes and decomposers which in turn improve “soil structure”.
 - Soil microbes and decomposers help the soil structure by adding glues that bind soil particles together into clumps.
 - Soil clumps (aggregates) allow for good air and water flow in soil.
 - Soil microbes and decomposers turn nutrients locked inside organic matter into food for plants.
 - Organic matter invites soil helpers.
- How does composting fit in?
 - Compost piles are all you can eat buffets beckoning to decomposers.
 - Compost is a balanced mix of organic matter that conditions the soil and feeds plants.
 - Benefits of compost:
 - Soil retains moisture AND drains better
 - Naturally fixes pH imbalances
 - Replaces conventional fertilizers
 - Diverts food and yard waste from landfill; turns into a resource!
 - Compost happens naturally everywhere.
 - In a forest, organic matter cycles through and is not removed. Soil is replenished.
 - In a garden we remove organic matter when we harvest.
 - Composting our food waste and yard waste allows us to replace what we have removed.
- Compost is made by decomposers who flock to the organic matter
 - Visible – worms, snails, centipedes, millipedes, pill bugs, sow bugs, springtails, ants, beetles, spiders, flies
 - Invisible or barely visible – bacteria, actinomycetes, fungi
 - Great explanations of compost microorganisms:
 - Cornell Composting <http://compost.css.cornell.edu/microorg.html>
 - CarryOnComposting.com <http://www.carryoncomposting.com/416920205>
- Two Great Methods for making compost within 2-3 months
 - Hot compost
 - Worm bins
- Hot Compost Piles
 - Build all at once
 - Gather materials ahead of time

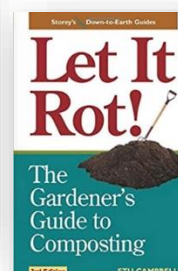
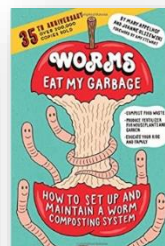
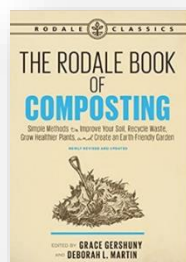
- Wonderful primer at fix.com <https://www.fix.com/blog/how-to-start-a-compost-pile/>
- 4 main ingredients
 - Browns (contain more carbon than nitrogen) i.e. dried leaves
 - Greens (contain more nitrogen than carbon) i.e. fresh leaves
 - Air
 - Water
- The browns and greens are the organic matter.
- Pay attention to the Carbon: Nitrogen (C: N) ratio of ingredients
 - If you use ingredients that are all about 30:1 the pile will heat.
 - Don't overthink it:
 - Rule of thumb: Add twice much brown material (by volume) as you add green material.
 - Layering is a great way to adjust volumes.
- Don't forget the air and water.
- Do not add:
 - Grass clippings sprayed with herbicide or pesticides.
 - Fats, oils, etc.
 - Unrinsed raw eggshells
 - Large pieces
 - Meat, bones, fish, grains or beans.
- Ideal Pile Size: 3x3x3
- Worm Bins
 - Guidelines for making
 - Great video about various ways to make simple worm bins: <https://youtu.be/3y44omiZabw>
 - 10-gallon plastic tote with lid
 - Opaque
 - Holes for ventilation
 - Optional holes at bottom for drainage
 - Bedding
 - Shredded paper
 - Coco peat
 - Peat moss
 - 1,000 – 2,000 worms buy from www.unclejimswormfarm.com
 - Feeding and care
 - 1 – 2 handfuls of food per day
 - fruit and fruit peels
 - vegetables, peels and tops
 - coffee grounds and filters
 - tea leaves and tea bags
 - melons and peels
 - flowers and stems
 - leaves, brown and green
 - 50 – 80 degrees F.
 - Moisture level: Damp as a wrung-out sponge.
 - To troubleshoot use the provided troubleshooting guide.
 - Harvesting – there are many methods. This is a good guide: <https://homesteadandchill.com/how-to-harvest-worm-castings/>
- Buying Compost in OKC
 - [CommonWealth Urban Farm](#) – locally made worm compost – \$11/1 gallon bags
 - [Fertile Ground](#) – locally made compost \$50/ cu. yard
 - [Minnick Materials](#) – locally made composts in bulk and more \$40 - \$50/cu. yard

Food scraps	15:1	Green
Grass clippings	19:1	
Coffee grounds	20:1	
Rotted manure	25:1	
	30:1	Ideal
Corn stalks	60:1	Brown
Leaves	40-80:1	
Straw	80:1	
Paper	170:1	
Sawdust, wood chips	500:1	

Actual content may vary.



- [TLC](#) – Humalfa Nature’s Prescription ~\$12/1 cu. foot bag. We use 2 bags per raised bed each time we prep beds. TLC also carries worm castings.
- [Organics OKC](#) – wide range of bagged options including worm castings
- [Home Depot](#) – Kellogg Brand \$8 bag. 2 cu. Feet/bag
- Using Compost at Home
 - Worm Castings
 - Worm castings are more concentrated than regular compost.
 - 1 Tbs – ¼ cup per plant in containers
 - Add ½ - 1 cup to potting mix
 - Side dress garden plants with a ¼ cup each a few times per season
 - Make worm castings tea out of it
 - Instructions on worm casting tea: <https://unclejimswormfarm.com/re-use-worm-leachate-worm-tea/>
 - Compost
 - How much to use
 - Raised bed mix can be a quarter compost to start with.
 - Mix additional into beds when preparing soil for each season
 - 5 – 10 cubic feet (1-2 wheelbarrow loads) per typical (4x10) raised bed
 - If using bagged, check recommendations on bag
 - Side dress (1 cup per plant) along surface of plants several times during the season or as needed.
 - Homemade compost tips
 - Consider sifting it.
 - Remove woody pieces that have not yet broken down.
 - Makes garden soil more suitable for sowing small seeds.
 - Construct a diy sifter: https://youtu.be/hVTf_31NwqA
 - Make compost tea out of it.
 - Instructions on making compost tea: <https://learn.eartheasy.com/articles/the-best-compost-tea-recipe-to-help-your-plants-thrive/>
 - Aeration method recommended.
 - Check out Garrett Juice: https://www.dirtdoctor.com/garden/Garrett-Juice_vq1927.htm
 - Only make compost tea out of homemade or locally homemade compost.
 - Troubleshooting
 - Compost is not breaking down
 - Add water
 - Let it dry out - aerate
 - Compost is smelly:
 - Add carbon
 - Aerate
 - Use this guide: <https://www.fix.com/blog/how-to-start-a-compost-pile/>
 - Reading



Worm Bin Troubleshooting Guide

If a problem does occur and you think you've found a solution, don't stop there. Continue to give your bin daily checkups until you see—or, in many cases, smell—an improvement. You may encounter some of the common problems listed below.

Symptom	Diagnosis	Remedy
Strong, Bad Smell	Not enough air circulation.	Fluff bedding. Make sure bedding or compost is not blocking the airholes.
	Too much food in bin.	Feed worms less food and/or less often.
	Improper food added.	Remove meat, dairy, and oily products.
	Anaerobic conditions.	Add bedding to absorb moisture.
Fruit Flies	Food exposed.	Bury food completely.
	Too much food.	Don't overfeed worms.
Ant Infestation		Place bin outside in colder weather (temperature must not be below 50°F).
		Immerse bin feet in liquid.
		A barrier of chalk or petroleum jelly may repel the ants.
		Place ant traps near, not in, your bin. If bedding seems dry, add water.
Mite Infestation	Mite population is high.	Avoid adding foods with high moisture content, such as fruits and vegetables.
Overly Moist	Too much water added to bedding	Stop adding water.
		Add paper to soak up extra moisture.
	Too much food with high moisture content.	Put in less fruit and vegetable waste.

Feeding

Worms are not picky when it comes to food, as they eat many of the same items you do. They especially enjoy vegetable and fruit peelings, coffee grounds and filters, newspaper, and veggie scraps.

Although worms eat fruit, be sure not to overload your bin with a high citrus diet. For example, if you are making a large amount of freshly squeezed orange juice, all of the remaining orange peels can introduce a toxic amount of d-limonene, a chemical that occurs naturally in citrus and other plants, into your bin. D-limonene is released as the peels are torn and broken down. So, you wouldn't want to pulverize the peels before adding them to your bin, as this would create a high d-limonene concentration. Due to the slow decomposition rate of citrus peels, however, it is okay to add small to moderate amounts to an established bin. If you add citrus peels to your bin and it begins to smell like a moldy fruit stand, then you may want to save it for a future feeding.

Worms do not have teeth! They have a gizzard, similar to birds, that helps them grind small bits of food. Adding ground-up eggshells, oyster shell "flour," or a handful of gritty soil to your bin will help your worms with this process. Other organisms you will find in your bin, like springtails and mold, assist worms by breaking down the food waste first. Some foods take longer to break down because they are more fibrous, such as broccoli stocks, carrots, and potato peels. Some people like to puree their food waste first, thus allowing the worms to eat more quickly and process even more food. Worms in a standard bin can eat about a pound of food a day.

Hot Compost Pile Recipe

Plenty of Air

We fluff up the pile with garden forks to add air.



Lots of Water

We add water as we are building the pile to make it nice and wet.



Nitrogen: Fresh “green” Organic Matter

Banana peels, veggie ends, cores and tops, coffee grounds and more.



Carbon: Dried up “brown” Organic Matter

Leaves, shredded paper, twigs and more.



OKC Harvest is the school garden support program of OKC Beautiful which enables students to experience hands-on learning through the transformative experience of planting, growing, and eating healthy food from their own school gardens. The garden-as-outdoor-classroom provides interdisciplinary learning that has far-reaching impacts on students' physical, mental and emotional wellness. Through school gardens we are nurturing the next generation of environmental stewards who will be involved and active in helping to make Oklahoma City a beautiful, safe and healthy place to live.

