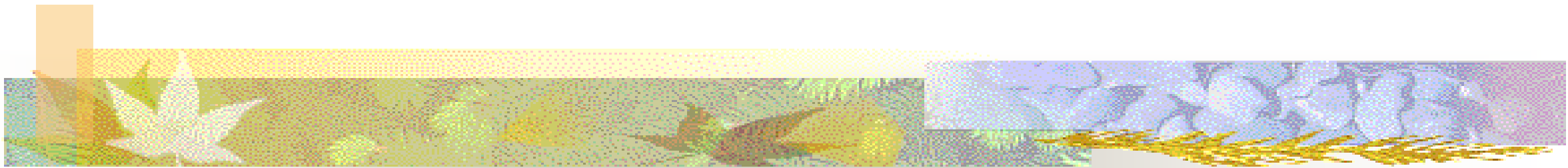


The Nature of Compost



Walton County Extension
Master Gardener Volunteers

What is Composting?

- Composting is the transformation of organic material (plant matter) through decomposition of **carbon** (*dried leaves*) and **nitrogen** (*food scraps*) into a dark, crumbly soil-like material called compost.
- Happens naturally – certain techniques can accelerate the process.
- Decomposers such as invertebrates (*insects* and *earthworms*) and microorganisms (*bacteria* and *fungi*) help in this transformation.



Bugs, Worms, and Flies, Oh My!

- Soil invertebrates chew, decrease size of materials for microorganisms.
- Mesophiles: microbes, decomposers that live and reproduce between 40° and 110° F.
- Thermophiles: microbes, decomposers that live and reproduce between 110° and 160° F.



Compost Through History

- Reference to use of manure in agriculture on clay tablets, 23rd century BC
- William Shakespeare's Hamlet advised: *"Do not spread the compost on the weeds, to make them ranker."*
- George Washington Carver said, *"...a compost pile is essential and can be had with little labor and practically no cash outlay."*



Composting Importance Grows

- In 1905, British agronomist Sir Albert Howard (the father of organic agriculture ... and of modern composting) learned best compost consisted of *three times as much plant matter as manure*.
- Rapid composting techniques developed in 1950-1960s



Why is Composting Important?

- Reduces waste stream
Yard and food scraps = 28.2% of landfill
- Improves soil structure
- Retains moisture, slows run-off from rain
- Reduces need for chemical fertilizers



What Composting Involves

- **Choosing a method...or two**
- **Finding a location...or two**
- **Adding ingredients**
- **Maintaining proper temperature**
 - **Decomposition is most rapid when the temperature is between 90° and 140° F**
- **Turning or relocating**
- **Watering - Maintaining moisture**
- **Harvesting and using**



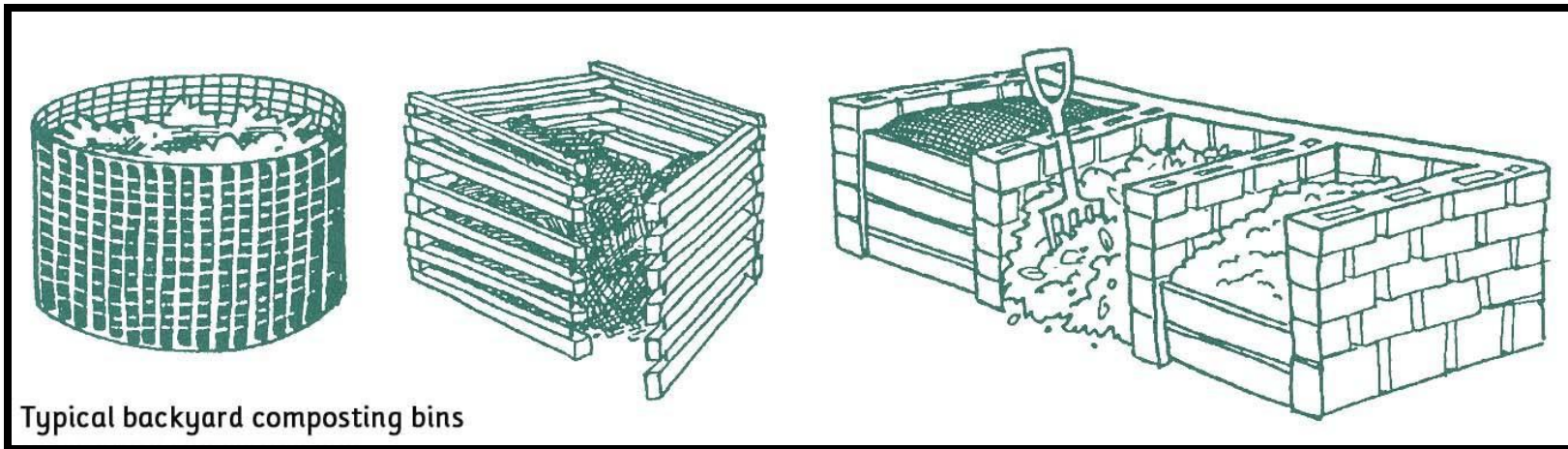
Starting a Compost Pile

- **Select a location – near your garden or kitchen but not too close to the house**
 - Best sited where protected from drying winds and where partial sunlight will help heat the pile.
 - The more wind and sun to which the pile is exposed, the more water it will need.
- **Make your own with chicken wire or pallets, buy a tumbler or 3-bin system.**



Starting your Compost Pile

- Ideal bin size is 3-foot cube or 4-foot cube.
Easier to turn, maintain aerobic action
- No larger than 5 x 5 x 5
Can be anaerobic if too large



Typical backyard composting bins

Kinds of Composting

- **Bin composting – 3 bins is ideal**
- **Tumbler composting**
 - **Commercial bin that rotates**
 - **When turned every day, produces compost in about a month**
 - **Small size**
 - **Good for kitchen waste**



Kinds of Composting

- **Direct composting**
 - Digging holes, burying waste
 - Sheet composting
 - Trench composting
- **Anaerobic composting**
 - Airless; done in plastic bags
 - Add a few handfuls of dirt
 - Leave in sun and turn every few weeks



Kinds of Composting

- **Vermicomposting**
 - **Worms produce superior nitrogen-rich compost**



Bins

- **Three bins are best**
 - **One that's active**
 - **One that's empty**
 - **One to store finished compost**



Tumblers

- **More expensive**
- **Limited capacity**
- **Good if space is an issue**
- **Easier to turn**
- **Two-sided allows one to “cook” while using the other to “add”**
- **Easier to access finished compost**



Bin-less Pile

- **Just a pile with no partitions**
- **Easy to use and nothing to build**
- **Moveable**
- **Hard to maintain sufficient depth to achieve high enough temperatures**
 - **Need a cubic yard to get interior hot enough to kill pathogens and weed seeds**



Tools:

- Bins or tumbler
- Rake to gather leaves
- Wheelbarrow
- Container for kitchen scraps
- Compost thermometer
- Pitchfork, auger, etc. to turn pile



Tools:

- **Hose**
- **Small tool to spread pile**
- **Compost sifter**
- **Gloves**
- **Scissors**



Active (Hot) Vs. Passive (Cool)

- **Hot composting**
 - Build pile with layers when available
 - Keep the temperature “right”: 110°-140° +
 - Turn often
 - Keep moist (Water = 40-60% of weight)
 - 1/3 green, 2/3 brown materials
 - Finished in 3-4 months.



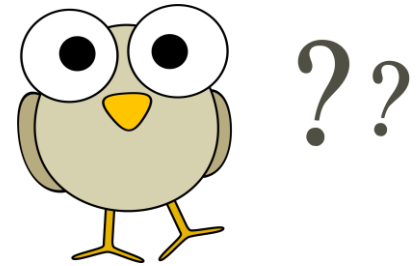


Active (Hot) Vs. Passive (Cool)

- **Cool composting**
 - **Continuous pile. Add material as it's available.**
 - **Trench. Kitchen scraps placed 12" deep and covered immediately. Typically near/in garden.**
 - **Sheet. Layers of newsprint, yard waste, dried leaves**
 - **Ready in 6-8 months (next season)**

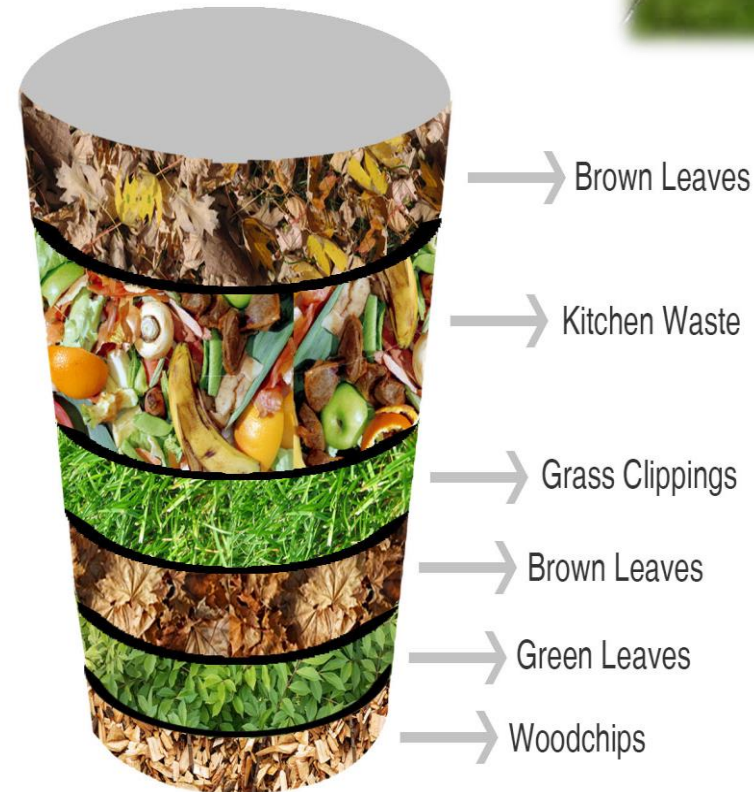
What Method Is Right For Me?

- How much space do I have?
 - Is it indoor or outdoor or both?
- What do I want to compost?
 - How much waste do I have a week?
- How and where do I want to use the compost?
- How much time can I spend on it a week?
- What's my *ewww!* factor?
- How committed am I to composting?



What goes in your Compost

- ❖ Carbon (**Browns**): 2/3 dried leaves, straw
- ❖ Nitrogen (**Greens**): 1/3 food scraps, plants
- ❖ Water: moisture
- ❖ Oxygen: turning



→ Brown Leaves

→ Kitchen Waste

→ Grass Clippings

→ Brown Leaves

→ Green Leaves

→ Woodchips

What **NOT** to Compost

- Meat scraps
- Bones
- Dairy products
- Oils
- Pet waste
- Diseased plants
- Invasive weeds



Green:Brown Ratio

- Should be 2/3 brown to 1/3 green
 - Leaves (brown)
 - Fresh grass clippings (green)
- Easy to remember “recipe”:
 - For every bucket of **greens**, add 2-3 buckets of **browns**

RECIPES FOR



Customize your compost to meet your garden's specific nutrient needs. After you get your soil tested, find the deficiency below you would like to fix and add a few items from the list to your compost pile. Make sure you still **keep the ratio** between brown and green items.



CARBON 2/3

Carbon

Brown materials make up the majority of good compost. Too much carbon slows decomposition so be sure to create a balance of carbon and nitrogen.

LEAVES	WOOD ASHES
SHRUB PRUNINGS	CORN COBS OR STALKS
STRAW OR HAY	NEWSPAPER



NITROGEN 1/3

Nitrogen

Greens are high in nitrogen & help build cell structures. For every bucket of greens you add to your compost, make sure to add 2-3 buckets of brown materials to balance your compost.

VEGETABLE SCRAPS	FRESH GRASS CLIPPINGS
COFFEE GROUNDS AND FILTERS	“GREEN MANURE” (plants such as alfalfa, legumes & clover)
MANURE FROM HERBIVORES	

Carbon

BROWNS

Dried leaves
Straw
Shredded paper
Dryer lint
Newspaper
Paper grocery bags
Pine needles
stalks (dried)
Sawdust

Peanut shells



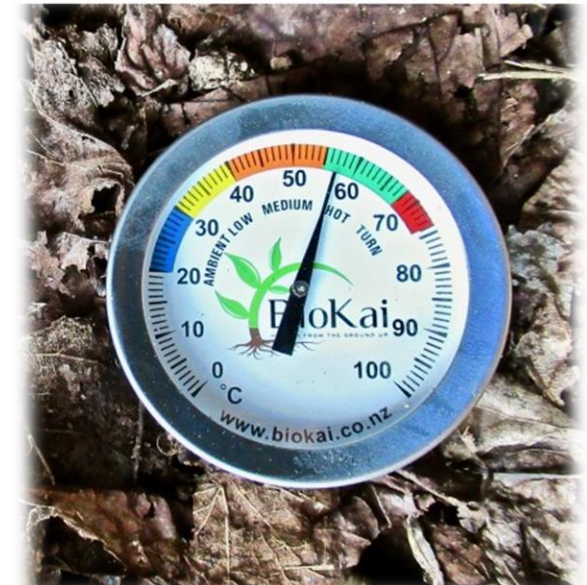
Nitrogen

GREENS

Kitchen scraps
Coffee grounds & filter
Tea with bags
Garden trimmings, grass
clippings
Pet hair
Manure (herbivores: corn
poultry, goats)
Fertilizer (Milorganite, blood
meal)
Egg shells

C:N Ratio...in the Real World

- ❖ Many ingredients used for composting do not have the ideal ratio. Most must be mixed to create “the perfect compost recipe.”
- ❖ High C:N ratios may be lowered by adding grass clippings or manures...or a handful of Milorganite or blood meal...
- ❖ Low C:N ratios may be raised by adding shredded paper, dry leaves, or wood chips.
- ❖ Watch temps daily and determine actions according to temperature.

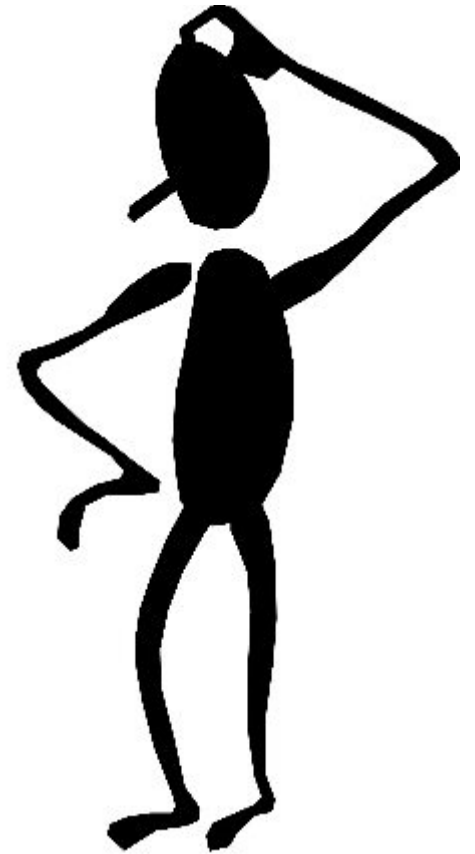


More from the Real World...

Concerns	Solutions
I don't have space	Use purchased bin like tumbler
It takes too long	Maintain proper conditions Cut up large pieces
It smells	Correct brown:green ratio Dry it out
Temps too low to kill diseases, fungi, weed seeds	Add high-N fertilizer for "heat"
Attracts animals	Bury food waste in center, bottom Cover green with brown

Troubleshooting

- **Materials not decomposing:**
 - Add water if dry
 - Turn pile or move to empty bin to add oxygen
 - Add more greens
- **Ammonia odor:**
 - Add browns such as leaves, straw
 - Turn pile to distribute
 - Dry pile
- **Rotten odor:**
 - Turn pile
 - Add coarse dry materials
 - Bury food scraps in middle/bottom third



Turn the Compost Pile...



...to add **oxygen**;
incorporate the **moisture**;
and keep the worms, bugs,
microbes happy and
eating your browns and
greens.

OK, When Is It Done?

When...

- Material is even color, texture and has an earthy smell
 - When you can't identify a leaf or a banana peel
- Temp of pile is in active stage for 1-2 weeks
- A small amount in sealed plastic bag creates no condensation inside bag



Sifting

- **Make your own or buy**
- **Place sifter over wheelbarrow**
- **Put 3-4 scoops compost into sifter**
- **Brush compost over sifter**
- **Compost falls into wheelbarrow**
- **Put remaining sticks and worms into new compost pile**
- **Place finished compost in separate bin**



Uses for Compost

- **Early stages as mulch**
 - Keeps weeds from growing
 - Helps retain moisture
 - Beneficial minerals go into soil
- **Later stages for soil amending**
 - Enriches soil
 - Helps with moisture retention
 - Improves drainage in clay soil
 - Attracts earthworms



Tips

- **Keep container close by for kitchen scraps. Empty daily or refrigerate.**
- **Shred papers from your office – no plastic coated papers**
- **Capture grass clippings twigs, and leaves through the season**
- **Pet hair from vacuum cleaner**

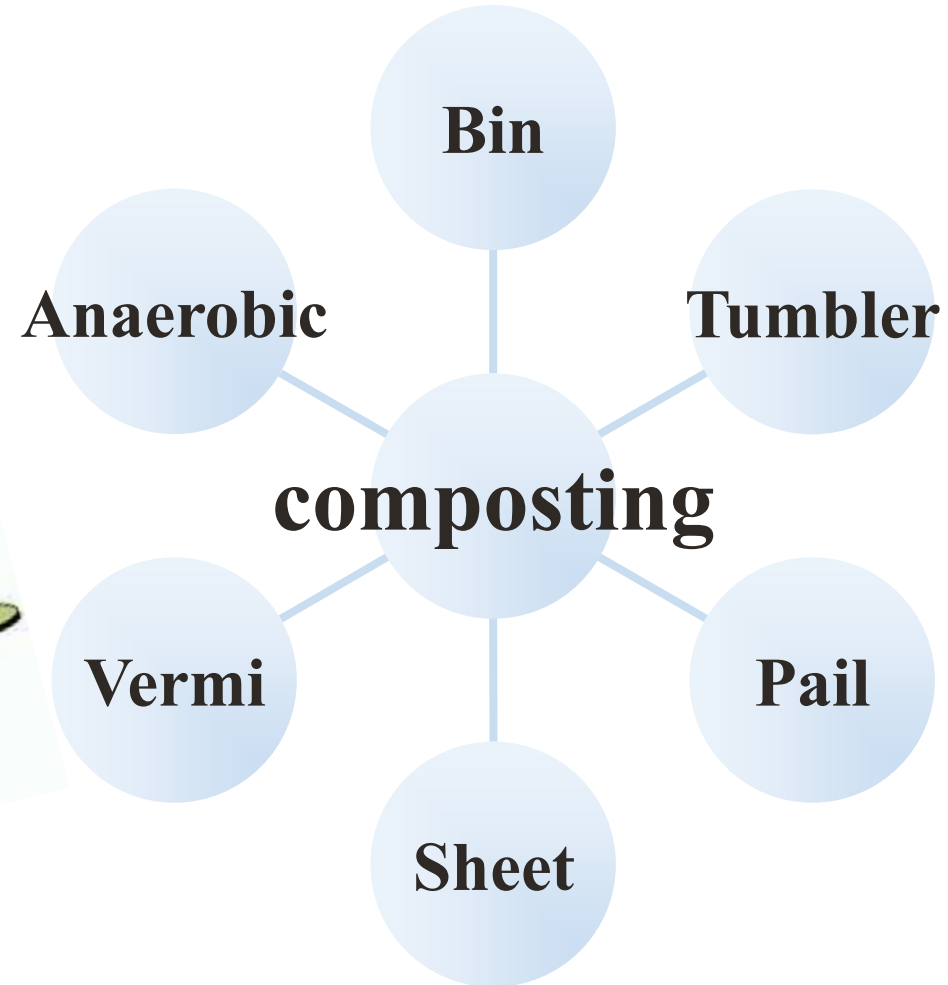


What About You?

- Do you have a compost pile?
- What is your style or preference?
- What changes would you like to make after today?

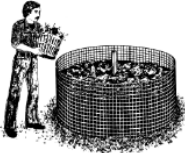



Just do it!



Resources

- UGA Extension publications online:
<http://extension.uga.edu/publications/detail.html?number=C816&title=Composting and Mulching>
- Library



COMPOSTING AND MULCHING

A Guide to Managing Organic Landscape Refuse

Wayne J. McLaurin and Gary L. Wade, Former Extension Horticulturists
Reviewed by Bodie Pennisi

Landscape refuse, such as leaves, grass clippings and trimmings, accounts for up to 20 percent of the wastes being placed in landfills. Bans on outdoor burning and laws that limit dumping of leaves and grass clippings into landfills make composting and mulching attractive alternatives for managing yard refuse and recycling natural materials. Some cities provide composting areas as a means of disposing of grass clippings and leaves; however, many homeowners find it more convenient and economical to compost these materials in their own backyards. Finished compost can be used as a mulch or as a soil amendment. This publication will help you build and maintain a compost pile and tell you how to use the compost in the yard and garden.

Soils can often be improved and made more productive by simply mixing organic matter with them. For many years, the most popular source of organic matter for soil improvement has been well-rotted farm manure, which now is less available, especially for the urban gardener. Today's gardeners should be aware of cheaper and more readily available sources of organic residues. These include plant materials from their own homes and yards, such as grass clippings, scraps of vegetable materials, small twigs, and especially fall leaves. To become usable soil amendments, these materials should undergo a degree of decomposition brought about by certain bacteria and fungi (microbes). The process by which gardeners convert organic matter for use is called *composting*, and the usable material is referred to as *compost*. The practice of applying materials such as compost, leaves, or grass clippings to the soil surface to modify soil temperature and moisture, and to control weeds and soil erosion, is called *mulching*.

Why Compost?

Composting is the most practical and convenient way to handle your yard refuse, because it's easier and cheaper than bagging or taking refuse to a dump site. Compost also improves your soil and the plants growing in it.

Although in time uncomposted materials will eventually decompose, adding undecomposed materials directly to the soil without first composting may have some undesirable effects. For example, if large quantities of uncomposted leaves are incorporated into the soil, microbes will compete with plant roots for soil nitrogen during leaf decomposition. This competition for nitrogen can cause nitrogen deficiency and poor plant growth. Composting breaks down organic materials into an end product that increases the availability of essential minerals such as potassium and phosphorous to growing plants and reduces the competition for nitrogen. The addition of composted materials also improves soil physical properties such as tilth, infiltration, drainage and water-holding capacity. Composted material is much easier to handle and mix with soil than uncomposted material.

Requirements for Efficient Decomposition

Decomposition of organic material in the compost pile depends on maintaining microbial activity. Any factor that slows or halts microbial growth also impedes the composting process. Efficient decomposition occurs if aeration, moisture, particle size, and nutrient levels (nitrogen) are maintained for optimum microbial activity.

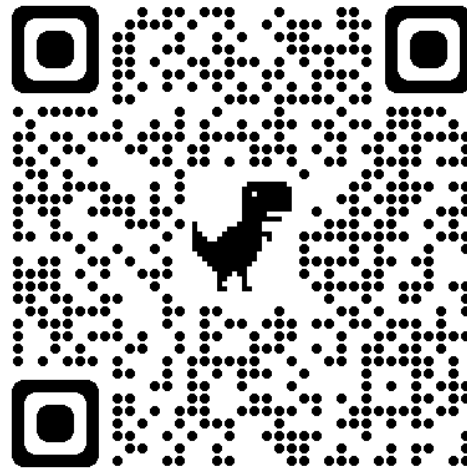
Aeration

Oxygen is required for microbes to decompose organic wastes efficiently. Some decomposition occurs in the absence of oxygen (anaerobic conditions); however, the process is slow, and foul odors may develop. Because of the odor problem, composting without oxygen is not recommended in a residential setting unless the process is conducted in a fully closed system (see plastic bag method under *Composting Structures*). Mixing the pile once or twice a month provides the necessary oxygen and significantly hastens the composting process. A pile that is not mixed may take three to four times longer to decompose. Raising the pile off the ground allows air to be drawn through the mass as the material decomposes.

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Would You Like a Copy of the PDF?

- The QR code will take you there!



<https://www.waltonmastergardeners.com/ppt-pdfs>



Walton County Master Gardeners invite you to
Free Fall 2023 Gardening Talks

Mondays 2:00–3:00 p.m.
O’Kelly Memorial Library
363 Conyers Road, Loganville GA

Aug 7: Fall Bulbs for Spring Color

Aug 14: Cool Weather Vegetables

Aug 21: Walton County Gardens

**Aug 28: Outsmarting Nuisance
Wildlife**

Sept 7: The Nature of Compost





Walton County Master Gardeners invite you to
Free Fall 2023 Gardening Talks

Tuesdays 4:00-5:00 p.m.

**W.H. Stanton Memorial Library
407 W. Hightower Trail, Social Circle GA**

Aug 8: Fall Bulbs for Spring Color

Aug 15: Cool Weather Vegetables

Aug 22: Walton County Gardens

**Aug 29: Outsmarting Nuisance
Wildlife**

Sept 5: The Nature of Compost





Walton County Master Gardeners invite you to
Free Fall 2023 Gardening Talks

Wednesdays 2:00–3:00 p.m.
New UGA Extension Office
1258 Criswell Rd SE, Monroe GA

- Aug 9: Fall Bulbs for Spring Color**
- Aug 16: Cool Weather Vegetables**
- Aug 23: Walton County Gardens**
- Aug 30: Outsmarting Nuisance Wildlife**
- Sept 6: The Nature of Compost**



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Projects

- McDaniel-Tichenor House
- Monroe Senior Center garden
- Gardening Talks
- Monroe Farmers Market
- Seed Libraries
- Blueberry Demonstration Orchard in Social Circle



Have More Questions? Need Help?

Contact us at waltonmg@uga.edu
770-267-1925

Walton County Extension
1258 Criswell Rd. | Monroe, GA
30655

Office hours: Monday - Friday
8:00 am-Noon & 1:00-5:00 pm

MG Help Desk hours:
Tuesdays 1:00-4:00

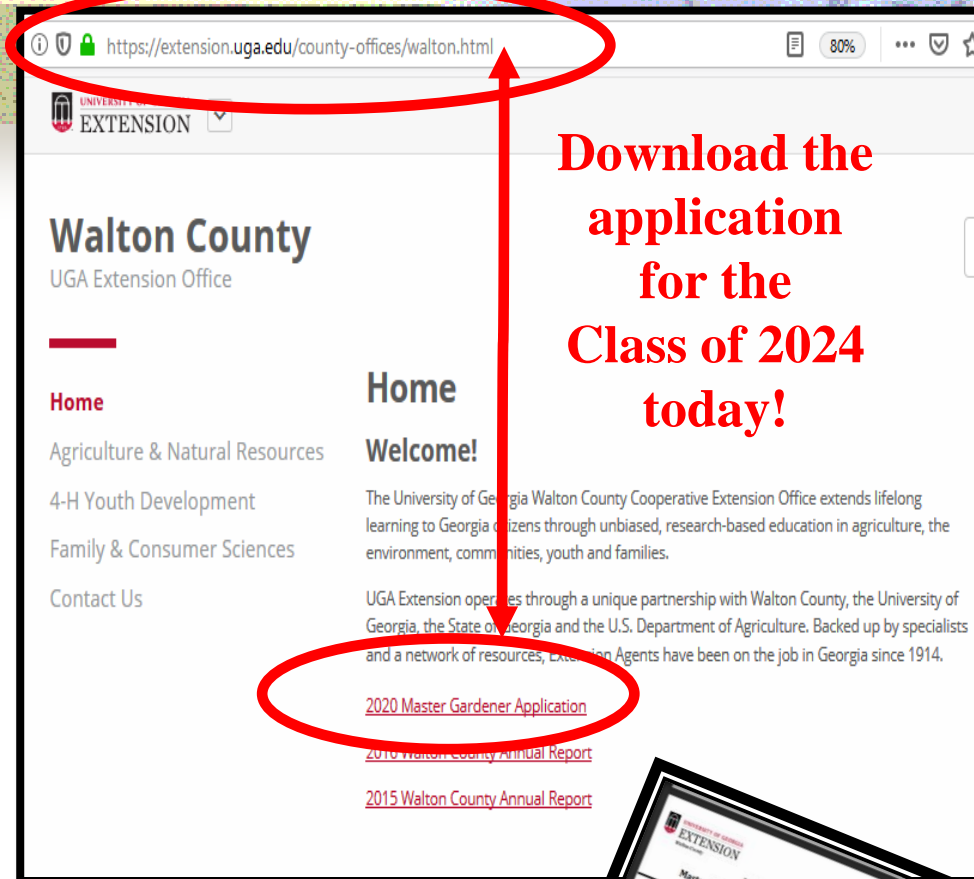


Want to be a part of a great group of gardening enthusiasts who love to share their time and talents with home gardeners?

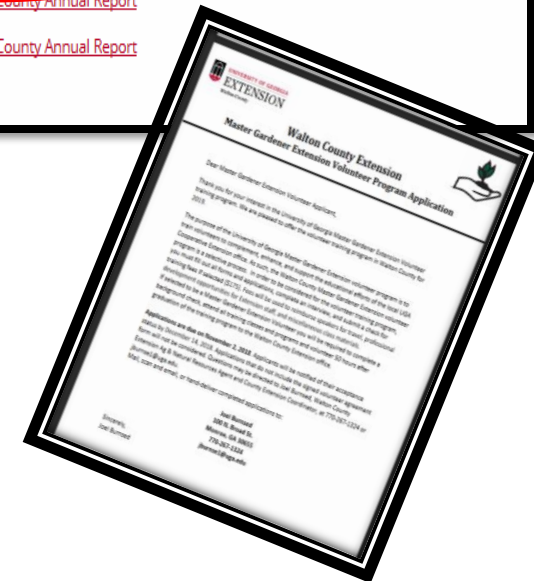
Join us!

The application for the WCMG Extension Volunteer Class of 2024 is now available online.

Classes will be held Sep.- Dec., 2023



Download the application for the Class of 2024 today!





Don't forget to fill out the evaluation!

Let us know what classes you would like to attend in the
spring of 2024.