Composting for Everyone

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Everyone Can Compost

- Young, older and in between
- Men and women
- Homeowners, apartment dwellers, people that rent, businesses
- You only need the key ingredients
Key Ingredients

- Compost/worm bin
- Designated area
- Carbons and nitrogens
- Water
- Turning tool for aeration
- Composting worms for vermi-composting
Composting Workshops
2011 Compost Workshops

- 38 workshops
- 1,298 attendees
- Tours of compost/mulch demo areas
- Bin pros and cons discussed
- 58% knowledge gain per pre- post- survey
2011 Compost Workshops

30 day, 60 day and 1 year post-workshop surveys:

- 87% started composting post-workshop
- 48% had finished compost in 3-6 months
- 52% using as soil amendment
- 32% as potting mix
- Most estimate yearly savings from $240-600
Decomposition

Road Map

- Turn Mess to Mulch
- Grass Clippings
- Develop a Sense of Humus
- Managing a Compost Pile
- Types of Compost Bins
- Uses of Compost
- It’s All About Choices!
Composting - controlled decomposition of organic materials

Compost - partially decomposed organic matter

Humus - completely decomposed organic matter

Mulch - organic or inorganic materials spread on the soil surface
Turn Mess to Mulch

What...

- provides a renewable resource
- conserves water
- controls weeds naturally
- releases nutrients
- insulates soil temperature
- beautifies the landscape?

MULCH!
Don't Bag It - Use It!
Reduce Lawn and Landscaping Clippings

- Go for slow
- Aim for maturity
- Plant only purposeful grass
- Create self-mulching areas
- Everything in moderation
Grass Clippings

Love ‘em

and leave ‘em

- Save time raking and bagging
- Free fertilizer
- Mow dry with a sharp blade
- Cut no more than 1/3
- Fertilize 2X/year
- Use slow or controlled release nitrogen
Think hummmmmm and puuuuuu

Don’t get confused on this!

**Recipe**:
- 2 cup canned chickpeas
- 1 1/2 tsp salt
- ½ cup vegetable oil
- 2 tbl coarsely chopped parsley or chopped mint
- 3 cloves garlic, finely chopped
- ¼ cup fresh lemon juice
Compost units

**Holding - Lazy**
- Simple containers/open piles
- Small volume
- Slow composting - 6-24 months

**Turning - Active**
- Rotating barrel/2+bins
- Large volume
- Mix/layer/turn
- Fast composting - A few weeks

*Your $$ or your muscles*
What Can Be Composted?

Anything that was once a plant

High Carbon
“Brown”
Twigs
Leaves
Sawdust
Wood chips

High Nitrogen
“Green”
Manure
Kitchen scraps
Grass clippings
Nitrogen fertilizers

Carbon to Nitrogen Ratio

The ideal ratio of Carbon to Nitrogen 30 to 1 (30:1)
To compost rapidly, you must "think like a microbe."

What do microbes need?

- Food
- Air ($O_2$)
- Moisture
Meet Your Microbes

Three classes of bacteria will go to work for you in an aerobic (well aerated) pile:

**Thermophiles**
*bacteria that thrive at temperatures between 105-140°F*

**Mesophiles**
*bacteria that thrive at temperatures between 70-90°F*

**Psychrophiles**
*bacteria that flourish at low temperatures down to 0°F*
Compost Critters

Decomposition assistants in later (cooler) stages

Actinomycetes*
Fungi
Sowbugs
Millipedes
Centipedes
Spiders
Earthworms

*microorganisms in soil-resemble bacteria and fungi
Sandwich Method

- Alternate 3-4" layers of green (high nitrogen) and brown (high carbon) materials
- Water each layer
- Start and end with a brown layer on top.
Building A Pile

Mix-It! Method

Mix the *Green* and *Brown* materials *before* adding them to the compost system

- Add the mixture in 4” layers
- Water each layer
- *Speeds up the composting process*
Managing a Compost Pile

- Turn after 4-7 days
- Water if dry
- Cover to hold moisture
- Finished when dark brown and crumbly
Managing A Compost System

Monitor Temperature

If you are using a hot composting method:

- Turn when pile temperature drops below 100°F
- Turn if the pile is more than 150°F
Managing A Compost System

Monitor Moisture

- Add moisture as you turn the pile.
- If too wet, turn.
- If still too wet, add dry "browns" to pile.
Managing A Compost System

Monitor Odor
(Odors are caused by too much nitrogen and/or water)

- **Turn if there are any odors**
- **Add "browns" if odors persist**
- **Bury food scraps**
Hot / Fast / Active Composting

Fastest rate of composting. Kills weed seeds, pests, and plant pathogens in the process.

Requires several elements to succeed:

- Minimum size - 3’ x 3’ x 3’
- Blend of greens and browns
- Proper moisture content
- Frequent turning provides air
- Less than 2-3” particle size
Composting Methods

Cold/ Slow/ Passive Composting

Sheet Composting
Top-dressing with organic material on the soil surface

Trench Composting
Composting directly in the soil

Cold Bin Composting
Fill your compost bin halfway with browns and bury kitchen scraps

Heap Composting
A collection of compostable materials
Managing A Compost System

Mixing and Turning

Turning has many benefits

- Adds Oxygen
- Helps Destroy Undesirables
- Reduces odor problems
- Breaks up clumps and layers
Use a “batch” process

After composting a while in the bin, set the compost aside to finish and start a new batch

Curing or “finishing”

Allow material to finish composting at lower temperatures
Managing A Compost System

Screening Compost

- Composting does not break down largest materials
- Screen larger materials. Add “overs” to next batch for bulk and aeration
Troubleshooting a Compost Pile

Wheel of Solution!

- Problem
- Cause
- Resolution
Uses of Compost

- Soil
- Potting mix
- Mulch
- Compost tea
THREE SITES AVAILABLE TO PURCHASE MULCH IN HILLSBOROUGH COUNTY

CHECK WITH YOUR COUNTY RECYCLING FACILITIES FOR MULCH AVAILABILITY

TYPES OF MULCHES AVAILABLE:
- YARD TRIM MULCH – UNSCREENED
- LOG MULCH
- AGED FINES – SCREENED
- PALLET WOOD
It's All About Choices!

- Your $$ or your muscle
- Your time or your $$
- Fast or slow
Well, maybe you can...

just shouldn't
Heightened Knowledge

- Significant increases in composting
- Recycling on-site
- Cost savings from using created soil amendments vs. purchasing them
Vermiculture – Worm farming - process of culturing worms to decompose organic food waste, turning it into nutrient-rich material

Castings – Worm waste, digested food

Omnivores – Animals that eat plants and animals

Hermaphrodites – Animals with male and female sex organs
Vermi-Compost Facts

- Improves soil structure and texture
- Aerates soil
- Increases water holding capacity
- Adds beneficial organisms = natural nutrient source for plants
Composting Worms
...any old worm just won’t do

Red Wigglers and Yellow Tails

- Optimum worms for vermi-composting
- Reproduce quickly
- Eat the most
- Ideal bait
- Food source for birds and small pond fish
- Round belly

Eisenia fetida (red wiggler), standard composting worm
Composting Worms

...any old worm just won’t do

African Nightcrawlers

– 3rd Choice

- AKA Big Red
- Reproduce quickly
- Big, soft and break easily
- Good for composting and fishing
- Flat belly
Worms

...are people, too (?)

Worms need:

- Temperature of 70-80 degrees
- Bedding and food
- Air – skin is their lung
- Moisture – Need water to breathe through their skin. Bodies are filled with water - even more than ours
- Can live in bottom of fish tank, if the fish don’t get them.
Externally segmented (with corresponding internal segments)

No skeleton

Designed as a "tube within a tube" - the digestive tract runs the length of the body from mouth to anus

Strong sets of muscles make up much of each of the inner and outer "tubes"

A blood-like fluid fills the rest of the space between the two tubes
Worm Parts

- Mouth - in front segment with protruding lip-like formation for food scoop
- No teeth
- Gizzard - food is digested here, like chicken
- No eyes - sensory ability alerts them of light, very light sensitive
- Male and female sex organs - still require (2) worms for egg fertilization
Worm Facts

- Consume their own weight in food daily
- Have 5 hearts, 1 brain, breathe through skin and lay eggs
- Double in population every 2-3 months in ideal conditions - (60°- 80°F)
- Life span – 15+ years
Worm Casting Advantages

- Contain 5 times the available nitrogen, 7 times available potash and 50% more calcium than 6” of good top soil
- Water soluble nutrients - immediately available for plant intake
- Hold 2-3 times their weight in water
- Will not burn root system unlike fresh raw manures
Building a Worm Bin

Materials Needed:
14-18 gallon plastic or Styrofoam container with lid
1 sq. ft. window or pool lanai screen
Duct tape
7-10 lbs. newspaper – not glossy pages (cardboard, brown leaves, straw, coconut husk fiber and white paper also work)
Bucket of water- soaking newspaper
2 cups coarse sand
2 lb. Red Wiggler worms
Electric drill with 1” spade bit
Building a Worm Bin

Directions:

• Drill at least 4 holes on all four sides of bin and lid
• Cut small pieces of screen to cover holes drilled
• Use duct tape to attach screen over holes on inside of bin
• Worms need air, and screen keeps them from escaping
• Prepare bedding by soaking shredded 1” strips of newspaper
• Wring out paper so it’s moist like a sponge
• Fill bin 2/3 full
• Mix 1 cup of soil in newspaper
• Empty worms onto bedding surface
• Put lid on bin
Types of Worm Bins
Feeding Worms

Feed daily, weekly or as desired of good top soil

Bread, spaghetti, fruit peels/cores, veges, egg shells

Bury food under bedding

Change feeding spots each time

Add more bedding after a month

Don’t add meat, dairy or fatty foods
Trouble Shooting Guide

- Unpleasant odor
  - Food overload – stir contents
  - Not enough air circulation – to wet – add fresh bedding
  - Unsuitable materials - remove

- Fruit flies
  - Bury food scraps, don’t overload bin, cover worms and bedding with plastic sheet, secure lid

- Worms dying
  - Not enough food or air – bury food and turn bedding
  - Too dry, wet or hot – moisten until slightly damp, add dry bedding, put in cool, shady spot
  - Bedding eaten, worms living in castings – harvest compost and add fresh bedding

- Mold growing
  - Too much food or too warm – put in cool spot, add dry material and stop feeding
Harvesting Compost

After 3-5 months

- **Option 1 – Push and Wait**
  Push compost to one side of bin. Fill empty side with new moistened shredded paper and kitchen scraps. Worms will eventually migrate to new food source. Compost can be removed.

- **Option 2 – Dump and Shine**
  Dump contents onto flat surface. Shine light on largest concentration of worms. Will migrate from light. Harvest when worms have moved.

- **Option 3 – Both at once – harvest worms and compost**
  Dump contents on plastic-covered table in daylight or under lamp. Form many small piles. Worms will move to bottom. After a few minutes you can remove compost free of worms. Ten minutes later, do it again. Rebed worms when finished.
Uses of Worm Compost

- Nutrient rich soil amendment
- Mulch
- Worm tea
- Potting mix: ¼ compost, perlite, peat and builders sand
References


University of Florida IFAS/Extension publication circular 455

www.bae.ncsu.edu/topic/vermicomposting/pub/index

www.wormdigest.org

Park Brown, Sydney. *Yard Trash to Garden Treasure*. UF
Reuse, Reduce, Recycle

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