COMPOSTING WORKSHOP

Sarasota County

UF UNIVERSITY of FLORIDA
IFAS Extension
Sarasota County Extension

Florida-Friendly Landscaping™ PROGRAM

Florida-Friendly Landscaping™ Principles

- Right Plant, Right Place
- Water Efficiently
- Fertilize Appropriately
- Mulch
- Attract Wildlife
- Manage Yard Pests Responsibly
- Recycle Yard Waste
- Reduce Stormwater Runoff
- Protect the Waterfront

What is:

- **Compost?**
  - The partially decomposed remains of plants and other organic materials.
- **Composting?**
  - The controlled decomposition of organic materials by microorganisms.
- **Humus?**
  - The final state of decomposition of compost.

Composting

Turning organic materials we throw away everyday into a useful soil enhancer

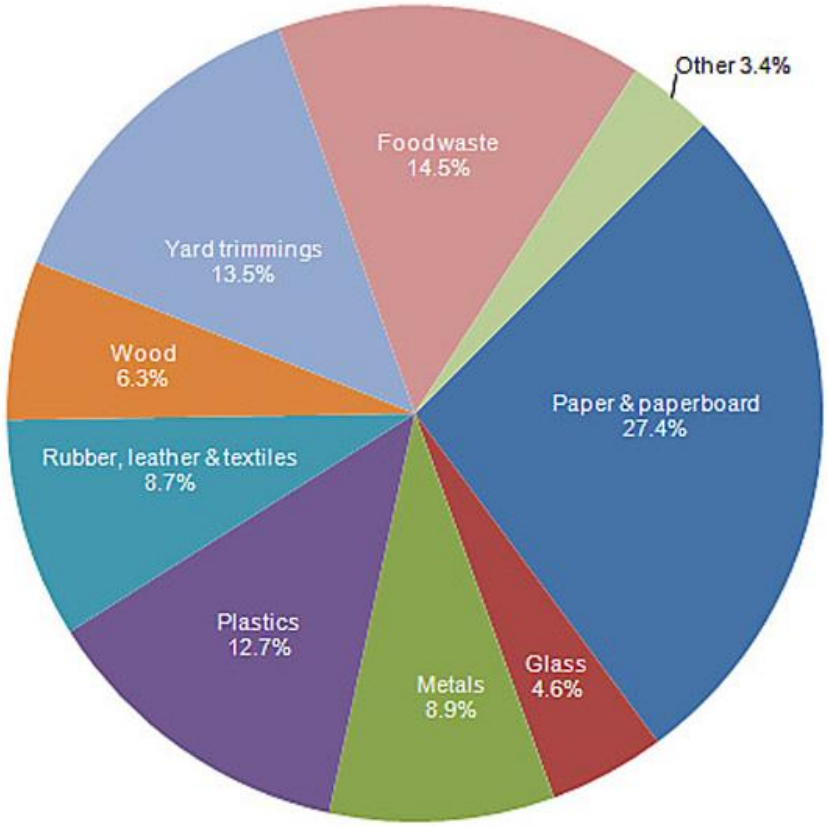
(Rich, black, sweet-smelling, crumbly, soil-like substance comprised of decomposed organic matter)

Why Compost?

- Recycle yard and kitchen waste
- Improve soil:
  - water holding capacity
  - condition and structure or porosity
  - resistance to wind and water erosion
- Support living soil organisms
- Reduce rate of nutrient release and buffer soil from chemical imbalance
- Improve plant and root growth
- Suppress plant disease

Why Compost?

Figure 5. Total MSW Generation (by material), 2012
251 Million Tons (before recycling)

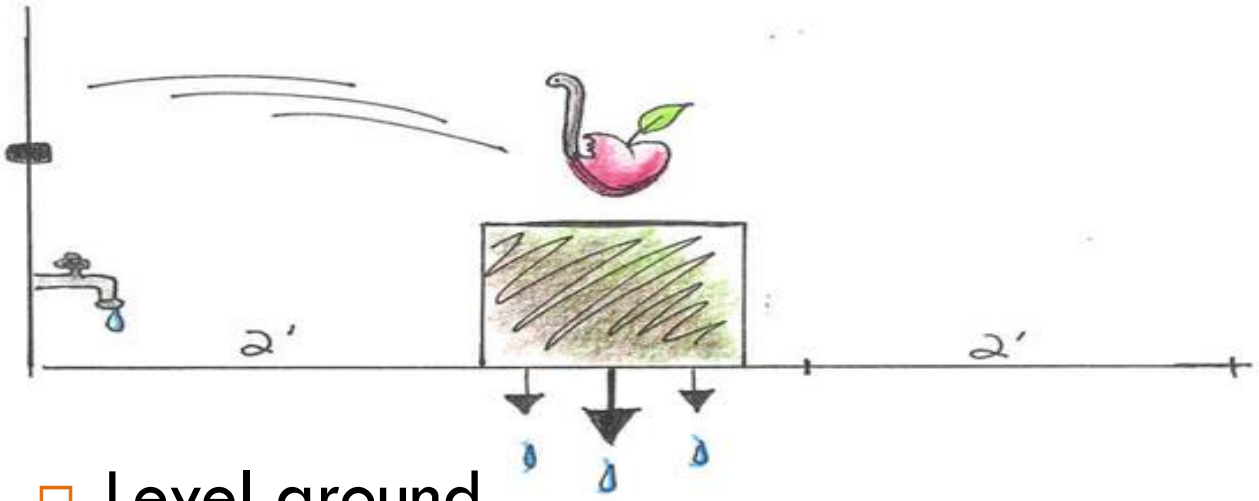


Composting at Home

Overview:

1) Selecting a Location
2) Choosing a Container
3) Assembling the Pile
4) Maintaining the Pile
5) Harvesting Finished Compost
6) Using Compost

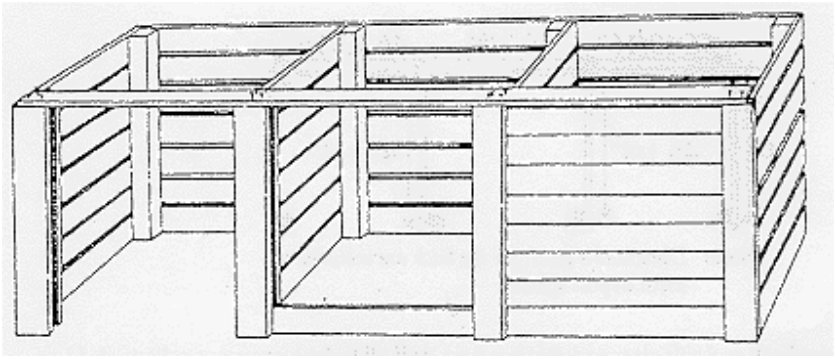
Selecting A Location



- Level ground
- Well-drained surface
- Near a source of water
- At least 2 feet from any structure
- Close to source of materials

Choosing A Container

- Bin
- Pile method (no bin)



http://sarasota.ifas.ufl.edu/compost-info

Compost Bins

Purchase a compost bin or build your own. Consider:

- Appearance
- Size: **at least 1 cubic yard**
- Accessibility: to add materials and remove finished compost
- Ability to mix materials inside
- Creature access

A bin is not necessary, but is useful for deterring pests and keeping the pile neat

Composters

Cage Compost Units

Three Bin Unit


Ro-Si

Composting Methods

Cold or "Slow" Composting

- Sheet Composting
- Trench Composting
- Cold Bin Composting
- Heap Composting

Pile (Heap) Method

- **No container is used; organic materials are simply mounded in a pile**

A layer of soil, leaves, or finished compost on top of fresh kitchen wastes will help deter pests

Hot or “Fast” Composting

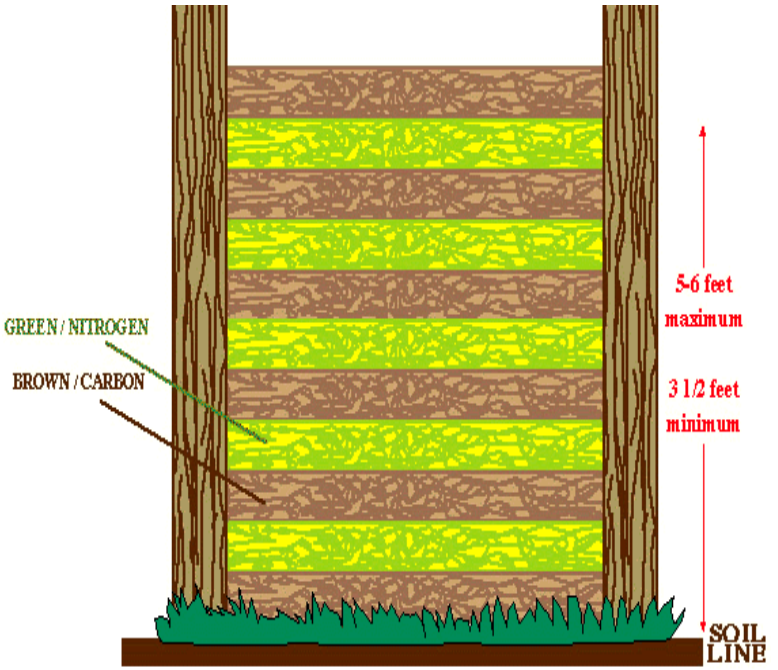
- Minimum of 1 cubic yard of material – 3’x3’x3’
- Blend of greens and browns (C:N Ratio)
- Proper moisture content
- Frequent turning to provide aeration
- Particle size of less than 2"-3"

Assembling the Pile

- **For faster decomposition, follow these steps:**
  - Put twigs or small branches on the bottom of the pile to allow air to circulate
  - Layer materials, alternating nitrogen and carbon layers
  - End with a carbon layer
  - Add water to moisten, not soak

Assembling the Pile
Sandwich Method

- Thin Layers help prevent anaerobic pockets
- Even distribution of moisture
- Filters odors



CROSS SECTION OF LAYERING IN COMPOST BIN

Assembling the Pile

Mix-It Method

- Mix green and brown materials
- Add 4 inch batches
- Water to add moisture
- Add new material when you turn pile

What Can be Composted?

- Leaves and yard waste
- Grass and lawn clippings
- Wood chips and sawdust
- Kitchen wastes
- Manure

Carbon to Nitrogen Ratio

- Food for the microbes
  - **Carbon** is an energy source
  - **Nitrogen** provides raw element of protein
- Browns and Greens
  - Brown = Carbon
  - Green = Nitrogen
- Optimum C/N Ratio:30/1 or Less

C:N Ratios

- **The carbon to nitrogen ratio determines the decomposition rate of organic materials**
  - Grass clippings ~ 20:1
  - Fruit waste ~ 35 :1
  - Leaves ~ 60 :1
  - Straw ~ 100 :1
  - Wood ~ 600 :1
- **30:1 is ideal, obtained by adding one part browns to one part greens**

C:N Ratios

- Coffee grounds 20:1
- Cow Manure 20:1
- Table Scraps 15:1
- Pine needles 60:1
- Newspaper 100:1
- Corn Stalks 60:1
- Veggie Trimmings 12:1

"Browns"

- Decompose slowly unless mixed with greens
- Provide carbon, the energy source for microbes
- Bulky materials help aerate
- May cause nitrogen deficiency in plants if not completely decomposed
- Typically low in moisture
- Examples:
  - Straw, leaves
  - Chipped branches, tree trimmings
  - Paper
  - Sawdust

“Greens”

- Decompose quickly
- Nitrogen Rich-Provide food source for microbes
- High in moisture
- Degrade Rapidly
- Compact easily
- Can be a source of foul odors
- Examples
  - grass, green leaves, kitchen scraps, and manure
  - Inorganic fertilizers
  - Coffee grounds

What Not to Compost

- Human or pet wastes
- Chemically treated wood products
- Meat, bones, or fatty food wastes
- Dairy products
- Diseased plants or weeds with seeds
- Plants treated with pesticides
- Oils or mayonnaise

Maintaining the Pile

- Moisture
- Aeration
- Pile temperature
- Particle size
- Carbon to Nitrogen (C/N) ratio

Maintaining the Pile

Moisture

- Microbes need moisture to thrive
- Ideal moisture level is 40-60 %
- Compost should feel moist, but not soggy
- "Squeeze test"-Squeeze compost in your hand: moisture should coat your hand, but not drip
- Add moisture as you are building your pile
- Check your moisture level regularly

Maintaining the Pile

Aeration

Helps:

- Microbes work efficiently
- Reduce unpleasant odors

Aerate by:

- Adding bulky items
- Turning the pile periodically

Maintaining the Pile
Pile Temperature

- Depends on:
  - Pile size
  - Available oxygen
  - Moisture content
- Ranges:
  - 122° - 131°F – most effective
  - 133° - 140°F – destroys diseases and weed seeds

Maintaining the Pile

Particle Size

- Smaller particles = faster compost
  - Break small limbs and twigs
  - Shred leaves, newspaper and palm fronds
  - Grind stumps
  - Coarsely chop larger pieces of vegetable matter (reduces overall size of pile)
- Particles can be too small
  - Saw dust

Compost Workshop – A. Post

Helpful Tips

- Run over leaves with a mower before adding them to the pile
- Keep pitchfork on site
- Cover pile with leaves or paper to avoid ants
- Water and turn at the same time with help of a friend

Adding More

- Bury new material deep into the pile
- Start a new pile or new section in the pile to allow the first to stabilize and finish
- New materials are a microbe food base

Managing the Pile

Monitor:

- smell: turn if you have odors
- moisture: add as you turn or build
- temperature: turn if the pile is
  - <100 degrees
  - >150 degrees

Managing the Pile

Turn to:

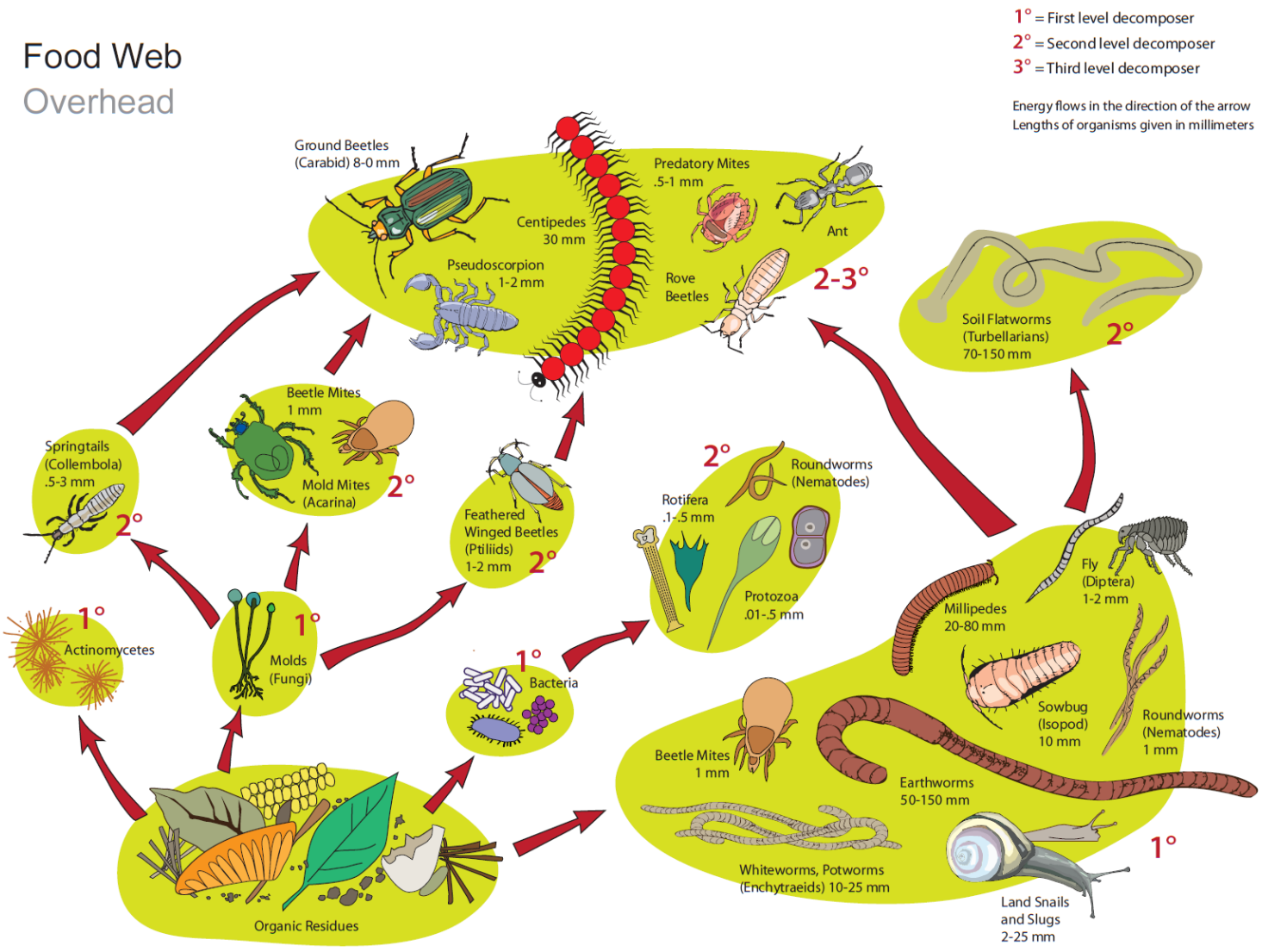
- Re-heat
- Add oxygen
- Destroy undesirables
- Break up clumps and layers
- Keep the smell down

Composting Players

Nature's Helpers

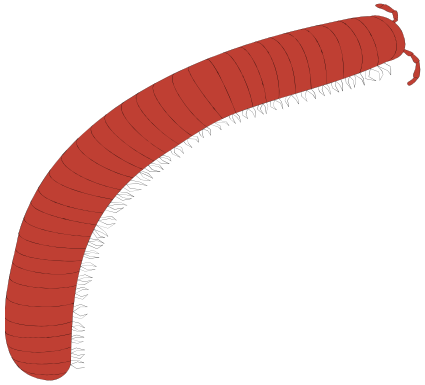
Food Web

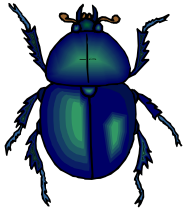
Overhead

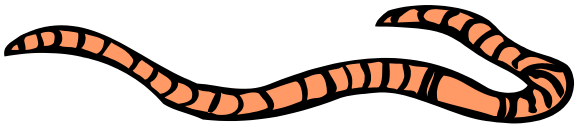


Who are the Players?

- Microbes/Bacteria
- Fungi
- Insects
- Worms

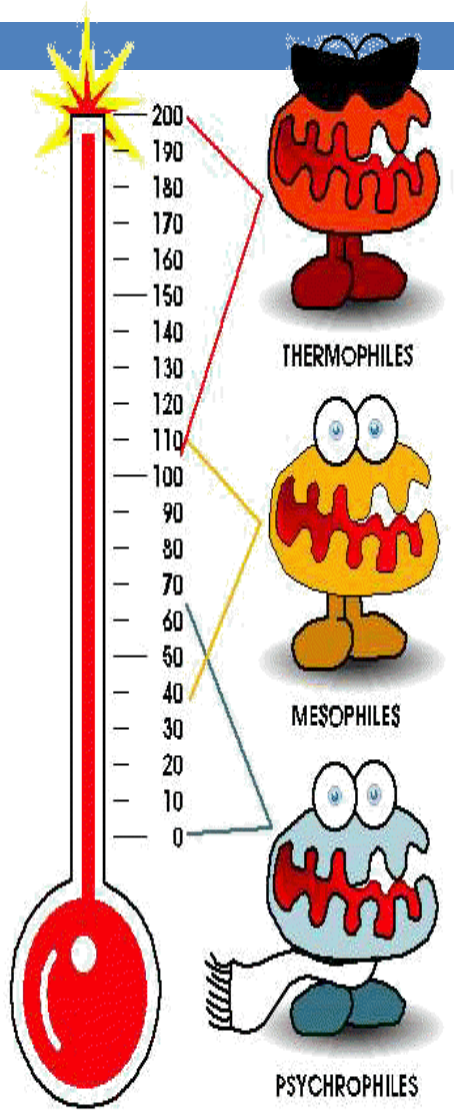






Microbes/Bacteria

- **Psychrophiles**
  - Early Colonizers
  - Optimal Temperature - 55°F
  - Produce some heat
- **Mesophiles**
  - Real workers of the pile
  - Thrive at temperatures from 70 - 90°F
  - Barely survive 40 - 70°F or 90 - 110°F
- **Thermophiles**
  - Work fast from 104 - 200°F
  - In 3 –5 days can turn green, gold, and tan organic matter a uniform brown.



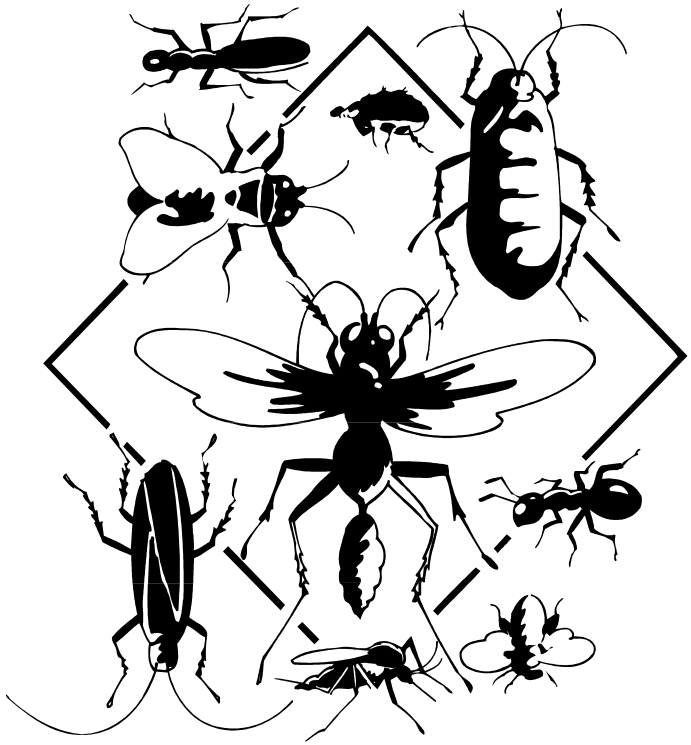
Actinomycetes

- Filament forming bacteria
  - Grayish cobweb like growth in compost
- Help break down lignin and cellulose
- Gives compost the pleasing earthy smell

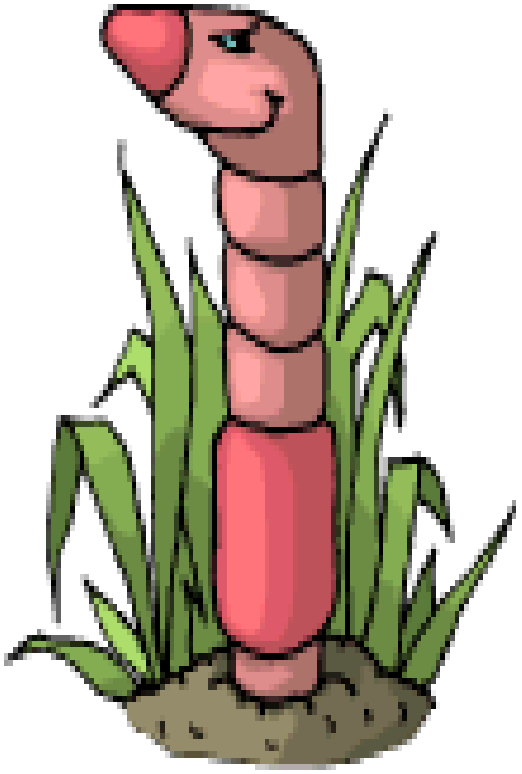
As the Pile Cools

Non-Microbial Players move in

- Fungi
- Nematodes
- Fermentation mites
- Springtails
- Centipedes
- Sow bugs
- Ground beetles



Earthworms



- Move into the pile when it cools
- Process and incorporate organic matter
- Increase aeration by creating channels in compost.

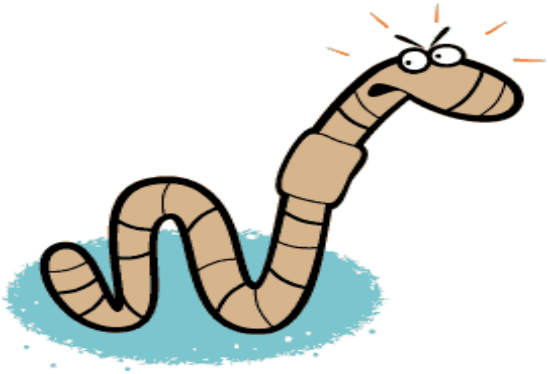
Vermicomposting

Composting With Worms

- Get a container
- Tear newspapers and add water
- Add worms
- Bury food scraps

Which Worms?

- Red wigglers – *Eisenia fetida*



- 2 pounds of worms will eat 1 pound kitchen scraps/day

Curing or Finishing

- Allow pile to cool
- Do not add more material
- Earthworms really assist at this time
- One month to a year

Harvest Compost

- Collect mature compost when it is dark, soil-like, and earthy smelling
- Screen compost
- Remove larger pieces and return those to the compost pile

Use Compost

- Apply to plant beds as a soil amendment:
  - gives sandy soils body to hold moisture
  - increases organic matter
  - breaks up clay soil for better drainage
- Use as mulch*
- Blend with sand, peat, and perlite for a potting media
- Compost Tea

***Layer 1" of compost underneath decorative mulch to save money and improve soil fertility**

Questions?

Resources:

http://sarasota.ifas.ufl.edu/compost-info

http://edis.ifas.ufl.edu

http://sarasota.extension.ufl.edu

http://sarasota.ifas.ufl.edu/compost-info/cn/

Thank you and Happy Composting!

- Sarasota County Extension: sarasota.ifas.ufl.edu
- Master Gardener Plant Clinics
  - plantclinic@scgov.net
  - 941-861-9807
- Wilma Holley, Florida-Friendly Landscaping™ Specialist
  - wholley@scgov.net
  - 941-861-9812

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