Basic Composting with Worms

Klickitat County Solid Waste

in cooperation with

The Washington State Department of Ecology

Composting is about making an environment that will encourage growth of the Agents of Decay.

Agents of PHYSICAL DECAY

Break up waste into smaller particles and transport of microbes by insects and small animals.

- Mites
- Millipedes
- Sowbug
- Worms
- Snails

Agents of CHEMICAL DECAY

Break down waste at the molecular level by microbes which include . . .

- Bacteria
- Mold
- Fungi
- Actinomycetes
- Protozoa

Food Web of Compost

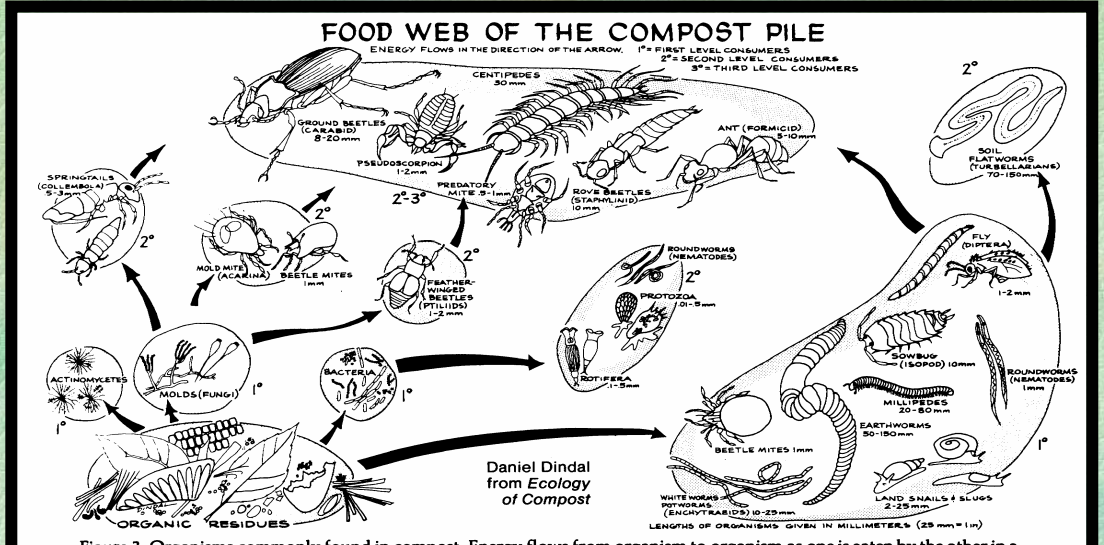


Figure 3. Organisms commonly found in compost. Energy flows from organism to organism as one is eaten by the other in a natural recycling system. Snails, beetles, millipedes, centipedes, and ants are less likely to find their way to worm bins set up with shredded corrugated and paper beddings.

Balanced Carbon/Nitrogen Ratio

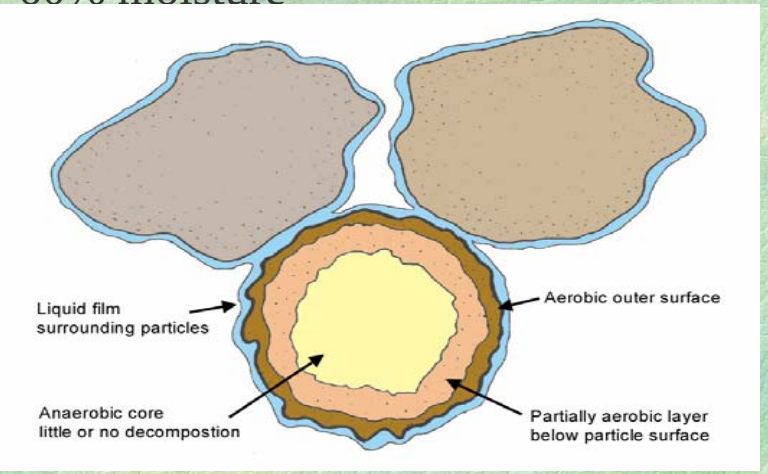
- Microbes need about 30 parts carbon to one part nitrogen in their diet.
  - Carbon is a source of energy for the microbes
    - About 2/3 of available carbon is used for energy
  - Carbon and Nitrogen become part of the microbe cell structure
    - This is how nitrogen is stabilized in compost

Moisture

- Microbe activity occurs in a thin liquid film on the surface of particles.
- Optimum: 40-60% moisture

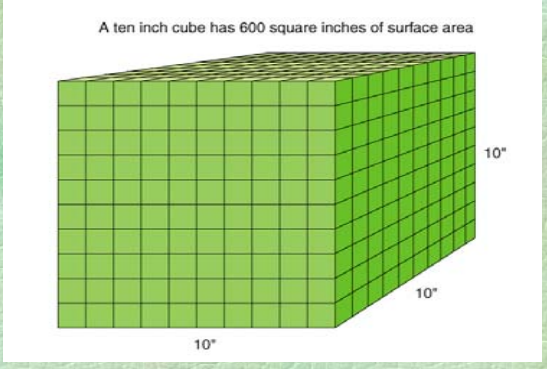
Too dry will stop activity.

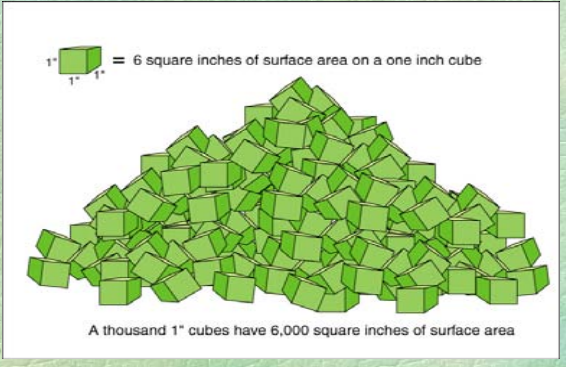
Too wet will block air and leach nutrients.



Surface Area and Particle Size

A 10x10x10 inch cube has 600 square inches of surface area. If you chop the cube up into 1 inch cubes you end up with 6,000 square inches of surface area.





Worm Bins

- Work best for food waste

Buried Waste Type Bin

Flow-Thru Type Bin

Buried Waste Type Bin

- In a buried waste type bin you fill the box with a neutral bedding material like shredded paper. You then bury the food waste in pockets. The worms and microbes will follow the food around the bin.

Flow-Thru Type Bin

- In a flow-thru type bin there is an upper chamber and a lower chamber. Food waste and neutral bedding are placed in alternating layers on the surface. When the lower chamber is full waste is then placed in the top chamber. Worms and microbes keep working toward the top and will follow the food waste into the top chamber. The lower chamber can then be removed and harvested of mostly finished worm castings.

Sequence of Decay

- On the following pages you will see photos from a worm bin taken over a period of 21 days.

Day 1: June 21

Coffee Filters

Apple

Shredded
Office Paper

Day 1: June 21

Office Paper

Day 4: June 24

Day 5: June 25th

Day 5: June 25th

Day 6: June 26th

Day 7: June 27th

Day 7: June 27th

Day 11: July 1st

Day 12: July 2nd

Day 13: July 3rd

Day 18: July 8th

Day 18: July 8th

Day 18: July 8th

Day 21: July 11

Day 21: July 11

Day 21: July 11

Day 1 to Day 21

Composting with Worms

- Includes all of the management techniques that apply to a common compost pile.
  - Differences:
    - Optimized for mesophilic bacteria, which consume waste faster than other microbe families.
    - Maintain temperatures between 70-85F
    - Worms break up food and paper waste creating more surface area for microbes
    - Worms help aerate the compost
    - Rapid stabilization of nitrogen
    - Works best on kitchen waste streams

Common Compost Materials

High Nitrogen	High Carbon
Bread	Leaves
Coffee grounds	Paper
Fruit	Sawdust
Fruit peels and rinds	Straw
Garden waste	Sod
Grass clippings	Tea leaves
	Vegetables
	Wood ash
	Wood chips

Don’t Try to Compost These...

- Butter
- Bones
- Cat manure
- Cheese
- Chicken
- Dog manure
- Fish scraps
- Lard
- Mayonnaise
- Meat
- Milk
- Oils
- Peanut butter
- Salad dressing
- Sour cream
- Vegetable oil

General Rule: avoid meat, fat, oil, dairy products, or manure from carnivorous animals.

Local Resources

- Neighbors
- Klickitat County Solid Waste

Do you want to sponsor a composting workshop?

You provide the location and get 6 or more folks to attend and we will provide the speaker and teaching materials.

Give us a call: 509 773-4448