Backyard Composting

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Whether you have one
many cows,
a few goats,
or kitchen waste...
Organic matter is a resource!!
Don’t waste it!
Methods of Composting

- Active windrows: This presentation
- Bins: This presentation
- Passive windrows
- Worms: (vermicomposting)
  - Fort Collins Worm Exchange (http://www.fcgov.com/recycling/worm_exchange.php)
  - Earthworm Digest (http://www.wormd Digest.org/)
What Are the Benefits of Composting?

- Reduces volume of material by approx. 30%
- Minimizes pathogen, weed, odor, and insect problems
- Stabilizes nitrogen and phosphorus compounds which minimizes water pollution
- Produces a useful and marketable soil amendment
- Sequesters carbon into a stable form that can be put back into the soil (instead of in a landfill)
What is Composting?

Composting is the

- managed,
- biological,
- oxidation process that converts
- heterogeneous organic matter into a more
- homogeneous, fine-particle humus-like material.

from the On Farm Composting Handbook (Cornell Composting)
http://compost.css.cornell.edu/OnFarmHandbook/onfarm_TOC.htm
MANAGED: what YOU do!

- Provide carbon (C) and nitrogen (N) in 30:1 ratio
  - Carbon: ‘brown’ and ‘benign’
  - Nitrogen: ‘green’ and ‘active’

- Provide oxygen for oxidation process at 5-50%

- Provide water to keep moisture at 50%
BIOLOGICAL: what microorganisms (MO’s) do

- Many species of bacteria and fungi metabolize the C and N to grow and multiply, using oxygen and water in the process.

- Composting is farming MO’s, which are present in the soil!
OXIDATION

- “In the presence of air”
- Used by MO in respiration
- Oxygen is in pore space in compost windrow
- Use bulking material and turn to maintain pore space for air
A variety of initial materials creates lots of air pockets, or pore space.
Heterogeneous Organic Matter / Feedstock

- Kitchen scraps (no meat, cheese or bones)
- Bedding
- Waste hay
- Spoiled feed or grain
- Leaves, grass clippings, yard trimmings (non-woody)
- Horse manure
Homogeneous, Fine-particle Humus-like Material

- This is the final product that you are aiming for at the end of a successful composting process.
How to Make Compost!

For any scale that you choose
Choose a site

- Mowed area, smooth, slightly sloping
- Near feedstock source
- Near water tap and at least 100 ft. from “waters of the state” or wells
- Control run-on and run-off
This is a bad location for manure or compost. Keep them 100 feet away from open water or wells.
Building the Pile

- Layer nitrogen source loosely with bulking material (C), adding water to 50%
- Add new material in same ratio of C, N, and water in the future
What happens inside the pile?

3-6’ tall

HOT AREA

Height and width depend on your feedstock volumes and equipment

END VIEW OF COMPOST WINDROW/PILE
Monitor the Pile

- Check temperature with compost thermometer (www.reotemp.com) or your hand
- Heat is an indicator of biological activity
- Graph heating cycle: increase then decrease
- After decrease, turn to aerate and add water, use graph to help with timing
Insert a thermometer into center of pile to monitor temperature, which is an indication of biological activity.
Even in winter composting organisms metabolize enough to produce substantial heat.
Continued Monitoring…

- After turning, monitor heat cycle again
- Turn when temperature decreases
- Check water; Add if necessary
- Repeat turnings until temperature ceases to rise (about 4 turning cycles)
Curing Phase

- When temperature curve flattens, mesophilic (mid-temperature) MO’s take over to finish process

- Keep windrow moist, less than 50%

- Takes 1-2 months (if you stop adding new material and let pile cure)
Why cure?

- Assures highest quality product
- pH shifts to neutral
- Soil MO’s re-colonize compost, impart disease suppressing qualities to compost
- If too much C left, use of this compost as a soil amendment may cause a temporary N deficiency, just the opposite of what you want!
- Makes compost optimum for plant growth
When is my compost done?

- After heating cycles stop
- After curing
- Check for homogenous, fine-particle humus-like appearance
- Earthy smell
- Maturity tests: Solvita test (recognized by states as a maturity test), and others, experience!
  - www.woodsend.org
When is my compost done (if I add kitchen scraps weekly?)

- The whole pile will never be finished if you keep adding fresh feedstock.
- So, here are some ways to access the good stuff and not throw your scraps in the landfill:
  - Make a 2nd bin and switch between the two.
  - After making the initial pile only add to the top using ‘lasagna system’.
    - Bottom of pile will compost and be ready in a few months (depending on season). Be sure to fork air into bottom area and manage moisture.
    - This system will require a harvest to separate the finished material and continue composting the unfinished material.
Now what??

- Useful soil amendment
- Contains N, P, K, micronutrients, and live microorganisms, amounts vary
- N is released slowly
- Topdressing with ½-1 inch is usually OK
- Send compost sample to soil lab with soil sample to correctly determine how much to apply
Compost Utilization

- How much nitrogen is available from applied compost in year 1, year 2, …?
  - Research suggests that 20-40% of the nitrogen is available the first year and 50% of the remaining nitrogen is available in year 2 (personal communication. L. Cooperband, February 27, 2005).
- Different composts mineralize at different rates!!!
- Soil sample every year!
Troubleshooting

- No heating
- Smells: rotten smell or like ammonia
- Etc, Etc!

QUESTIONS?

Happy Composting!