2014 O.G.S. Harvest Conference

Back Yard Composting Made Easy

Mark Langner
MAYTime Composting
Burnsville, NC
Mark Langner

- Life-Long Gardener and Bad Composter.
- In 1999 I Married a Couple Horses:
- Compost Bins, Worm Bins, Aerated Bays.
- Community Garden (2009).
- Owner and Founder, MAYTime Composting Systems, Burnsville NC. (2011)
What Is Compost?

“Compost? That’s basically S***, isn’t it?”

Compost is organic matter that has been decomposed and stabilized by bacterial and fungal processes, becoming a material that is beneficial to plant growth. (USCC Def.)

Properly done, the composting process kills harmful organisms and weed seeds.

A Diversity of LIFE – The “Soil Food Web”.
Essential Ingredients
For Good Compost

- Green Stuff (Nitrogen-Rich materials)
- Brown Stuff (Carbon-Rich Materials)
- C and N Must Be in organic compounds!
  - Charcoal + Air Does NOT = Compost!
- Oxygen
- H2O
- BALANCE!
- What do YOU have to compost?
Carbon-Rich Materials

- Leaves
  - C:N Ratio Varies Widely
  - Oak Leaves: as high as 200:1
  - Maple Leaves: 30:1 – Ideal “As Is”
- Sawdust, Wood Chips
- Straw, Corn Stalks
- Paper / Cardboard
Nitrogen-Rich Materials

- Manure – NO Dog or Cat Poop!
- Blood Meal
- Fresh Grass Clippings
- Food Scraps (BUT 90% Water)
- Coffee Grounds (and filters)
- Tea Bags
- Spoiled Sileage
- Weeds
Balance!

- **C:N Ratio**
  - 20:1 to 50:1
  - “Ideal” is 30:1
  - 50:1 for Cool Composting

- **Too much N?**
  - Pile Can Overheat
  - Smell of Ammonia – and Loss of N

- **Not enough N?**
  - Cool Pile
  - Longer to Break Down
Balance!

- C:N of 30:1 – How Do You Know?
- S.O.P Method: 2 Parts Brown, 1 Part Green
- NC Dept of Ag Waste Analysis Report
- Compost Calculators on Web
  - www.klickitatcounty.org
  - Green Mountain Technologies
## Waste Analysis Report

**Grower:** Langner, Mark  
125 Ewing Ln  
Burnsville, NC 28714  

**Report:** W03543

**Received:** 11/30/2011  
**Completed:** 01/20/2012  
**Farm:** Yancey County

### Sample Information

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<thead>
<tr>
<th>Sample ID</th>
<th>Laboratory Results (parts per million unless otherwise noted)</th>
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| Waste Code: | NH4  
SSB  
-NH3  
Description: OR-N  
Horse Surface Scraped  
Urea |

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| Waste Code: | NH4  
SSB  
-NH3  
Description: OR-N  
Bee Surface Scraped  
Urea |

### Recommendations:

#### Nutrients Available for First Crop

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<tr>
<th>Application Method</th>
<th>N</th>
<th>P</th>
<th>K</th>
<th>Ca</th>
<th>Mg</th>
<th>S</th>
<th>Fe</th>
<th>Mn</th>
<th>Zn</th>
<th>Cu</th>
<th>B</th>
<th>Mo</th>
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<td>1.8</td>
<td>5.0</td>
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<td>Soil Incorp</td>
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<td>1.4</td>
<td>0.98</td>
<td>0.87</td>
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### Other Elements

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<tr>
<th>Nutrients Available for First Crop</th>
<th>lbs/ton (wet basis)</th>
<th>Other Elements</th>
<th>lbs/ton (wet basis)</th>
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<tr>
<td>Na</td>
<td>Ni</td>
<td>Cu</td>
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<tr>
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Results for carbon, pH and soluble salts have been added per your request. Report recompleted Jan. 18, 2012 (hrc)

Reprogramming of the laboratory-information-management system that makes this report possible is being funded through a grant from the North Carolina Tobacco Trust Fund Commission.

*Thank you for using agronomic services to manage nutrients and safeguard environmental quality.
- Steve Troxler, Commissioner of Agriculture*
Balance!

- Not Enough Oxygen?
  - Swamp Smell
  - Does Not Heat Up

- Too Dry?
  - Does Not Heat Up

- Too Wet?
  - Pile Becomes too Dense = Not Enough O2!
Balance!

- Aim For 50-70% Moisture Content
- “Squeeze Test”.
  - Should Feel Like a Damp or Very Damp Sponge.
  - Material Should Clump.
  - A few drops of water? OK.
  - Lots of water? Too wet.
Other Measurements

- Bulk Density
- Target Range: 800 – 1200 lbs / cu yd.
- Too Dense? Can’t Get O2!
- High Tech Bulk Density Tester:
  - 5-Gallon Bucket: Fill 1/3, Drop Several Times.
  - Fill 2/3, Drop; Fill to top, Drop; Top Off
  - Weigh: 20 – 30 Lbs OK
Other Measurements

- pH – Best is Near Neutral (7)
- Composting Process Tends to Bring pH Toward Neutral
- Avoid Adding Wood Ash and Lime
  - Lime Causes N to be Released
- Amend pH AFTER Compost is Finished
Composting Phases

1) Hot – 131 F and Above
   - Primarily Bacterial
   - Kills Pathogens and Weed Seeds

2) Warm – 105 to 120 F
   - May be More Fungal

3) Curing / Ageing – Three to Six Months
   - “Raw” Compost Can Have High Soluble “Salt” Content and “Burn” Plants.
Organic Standards (USDA)

- Must Meet Temperature Requirements.
- Monitor Temps, O2 Levels, Times, H2O, etc.
- Other Testing Requirements for Stability, Contaminants, Pathogens.
- No Synthetics.
- “Hit List” of Forbidden Chemicals.
- Document: USDA NOP 5021
Simple Bin
Simple Bin
How Big?

- 3’ x 3’ x 3’ (1 Cubic Yard) Minimum
- Smaller May Not Heat Up Well
More Home Setups
More Home Setups
More Home Setups
Other Equipment

- Compost Screener.
  - Remove Un-Composted Material (Wood Chips)
  - DIY – 2x4 Frame with \( \frac{1}{2} \) Inch Hardware Cloth
- Thermometer.
- O2 Gauge.
Compost Screen
Techniques

- Mix All Materials (Bulk Density!)
- Layer Materials
  - Sticks – Manure – Leaves – Grass Clippings
  - Repeat…
- “Sheet Composting” (Lasagna Bed)
  - Layer: Cardboard, Manure, Leaves, Compost
  - A Little Soil on top for Seeds
  - Plant Right In It!
Questions?

With Compost  No Compost
Tiny Compost Bins
Vermicomposting Basics

- Worms “Eat” Decaying Organic Matter
- Excrete “Casts” – Full of Good Stuff
  - Humic Acids, Growth Factors, Available N, etc.
- “Red Wigglers” (*Eisenia Fetida*)
  - Multiply Fast
  - Eat 50% (or more) of their own weight each day
  - Stay at home
- “Earthworms” less suitable
Worms – What They Need

- Moisture – 50% to 80%
- Air (Bedding Provides Air Space)
- Grit (Soil)
- pH 6 – 8 Ideal
- Temperature: 50 – 85 F (Dead at 100)
- Dark
Worm Bedding

- Shredded Cardboard, Coconut Coir, Peat Moss, Finished Compost
- Shredded Paper? Leaves? Possibly, but they *can* get too compacted
- Bedding can also be Food: e.g. Compost, Cardboard, Coir, Cotton Gin Trash
Worm Homes
Simple Bin
Worm Homes
Worm Homes
Worm Homes
Worm Homes
Worm Food

- **Kitchen Scraps** (No Meat, Fat, Dairy)
  - Avoid Lemon Peels or Too Much Citrus
- **Manure** (Small Amounts)
  - Avoid Chicken Manure
- **Finished Compost**
- **Coffee Grounds** (Small Amounts)
- **Watermelon!**
Worm Feeding

- Moderate Amounts of Food
  - Too Much Can Heat Pile!
- Bury Food In Bedding
  - In The Top Few Inches
Harvesting Castings

- Shift Feeding to Opposite End of Bin
  - Best With Larger Bin
- Move Top Layer To Another Bin
  - Finished Material Is On Bottom
  - E. Fetida Likes Top 6 Inches
- Set Pile Under a Bright Light
  - Scrape Away Castings a Little at a Time
Harvesting Castings
Harvesting Castings
Harvesting Castings
Using Worm Castings

- A Little Goes A Long Way
- \( \frac{1}{4} \)” to \( \frac{1}{2} \)” Layer on a Bed
- Small Handful for Plant Starts
- 10-15% in Seed Starter Mix or Potting Soil
No Worm Castings.  
With Worm Castings.
Any Questions?
Learn More About Worms...

- Home and Small Farm Vermicomposting,
- Sept. 13, 1-4 pm.
- More Coming…