Outline: The following is the outline used when presented material given in Mountainair New Mexico May 21, 2010.

1. Welcome and give thanks
2. Review Topics
   a. What is composting?
   b. Why produce compost?
   c. Benefits of adding compost to soil
   d. Other benefits of composting
   e. Typical uses of composted materials
3. What is composting? (aka Organics Recycling!)
   a. A biological way to speed up the decay process of organic material
   b. Controlling oxygen, water, carbon, nitrogen
4. Why Produce Compost?
   a. Turns nuisance-causing waste into valuable commodity
   b. Saves landfill space
   c. Can decrease tipping fees
   d. Can produce revenue from soil conditioner sales
   e. Benefits are long term
   f. Improves properties of Soil
      i. Physically (Structurally)
      ii. Chemically (Nutritionally)
      iii. Biologically (Microorganisms)
g. Compost adds organic matter, humus, & beneficial microorganisms to soil
h. Compost is stabilized
i. Stores well vs. manure: Fewer odor and fly problems
ii. Can be applied at convenient times of the year

5. Soil Composition Chart

<table>
<thead>
<tr>
<th>Name</th>
<th>Size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very coarse sand:</td>
<td>2.0-1.0 mm</td>
</tr>
<tr>
<td>Coarse sand:</td>
<td>1.0-0.5 mm</td>
</tr>
<tr>
<td>Medium sand:</td>
<td>0.5-0.25 mm</td>
</tr>
<tr>
<td>Fine sand:</td>
<td>0.25-0.10 mm</td>
</tr>
<tr>
<td>Very fine sand:</td>
<td>0.10-0.05 mm</td>
</tr>
<tr>
<td>Silt:</td>
<td>0.05-0.002 mm</td>
</tr>
<tr>
<td>Clay:</td>
<td>&lt; 0.002 mm</td>
</tr>
</tbody>
</table>

6. Soil Benefits of Compost Physical
   a. Compost Benefits for sandy soil
      i. Humus improves soil fertility
         1. Holds water - lowers H20 bill
         2. Holds micronutrients
      ii. Compost adds beneficial microorganisms
      iii. Humus improves soil aggregation
         1. Soils more resistant to erosion
b. Compost benefits for clayey soils
   i. Humus, organic matter breaks up clumps of fine soil grains
      1. More air in root zone
      2. Reduced bulk density
   ii. Improves soil drainage & porosity
   c. Soil/vegetation more resistant to drought
   d. Allows moisture dispersion
      i. Allows water to move laterally from application point
   e. Improves workability
   f. Increases gas & water permeability
      i. Reduces erosion
      ii. Resists compaction

7. Soil Benefits of Compost Chemical
   a. Makes current fertilizer programs more effective
   b. Soil retains nutrients longer which reduces nutrient loss by leaching
   c. Keeps nutrients in root zone
   d. Compost has the ability to bind heavy metals & other contaminants (Humus Acid) - can’t be leached
   e. Same binding effect allows compost to be used as a filter media for storm water
   f. Degrades some toxic compounds
      i. Petroleum hydrocarbons
   g. Weed Control-immature compost (mild herbicide)
8. Soil Benefits of Compost Biological
   a. Provides Soil Biota: Bacteria, Fungi, Actinomycetes, Protozoa depending on Organic Matter
9. Other Benefits
   a. Compost changes wastes to resources
      i. Post consumer foods - grocery, restaurants
      ii. Yard trimmings, leaves (was “yard waste”)
      iii. Animal bedding (chicken, horse, cattle, etc)
      iv. Ag waste: Gin trash, chile skins, pecan hulls & trimmings (15%-25% orchard pruned per year)
      v. If bedding manures applied they have high C:N ratio and rob soil of N – compost lowers C:N ratio to more acceptable level
      vi. Provides way to recycle solid wastes bound for landfill
          1. Approximately 20% of landfill volume
          2. Approximately 20% of tipping fees
          3. Approximately 70% could be composted
          4. Less methane production and subsidence of cap
      vii. Very cost competitive w/ other soil amendments like peat moss (Canada)
      viii. Biosolids compost is stable vs. lime treated, irradiated, or flash-dried (Milorganite)
10. Typical uses of compost
   a. Turf grass - parks
      i. amending poor soil, bare areas
      ii. Under swings, heavily traveled areas
   b. Golf courses
      i. 1/2” minus (particle size) needed
      ii. Typical Mix below
          1. 15% compost
          2. 65% sand – cushion
   c. Landscaping
      i. Surface mulch - flower beds, trees, gardens, commercial gardens
      ii. Potting soil component for nursery, home
      iii. Seed bed material

11. The COMPOST PILE as found in nature
12. First INGREDIENT Carbon
   a. AKA the Brown Stuff (dead and dried) excellent sources of carbon
   b. Paper
   c. Dried Leaves
   d. Straw
   e. Chipped branches and tree trimmings
   f. Second INGREDIENT Nitrogen
13. Compost Quality
    a. Compost Nutrients
    b. NPK
       i. Percentage of Nitrogen, Phosphorus, Potassium
       ii. Estimates macronutrient content
       iii. Usually near 1:1:1 for compost
    c. Compost is not fertilizer
       i. Works in tandem with inorganic fertilizers
       ii. Allows reduction in fertilizer use
14. Compost Microbes
    a. The Soil Food Web
    b. Compost Food Web
    c. Composting Microorganisms
15. **Microbial Temperature Regimes**

![Graph showing growth rate vs. temperature for different microbial types: Psychrophiles, Mesophiles, Thermophiles, and Hyperthermophiles.]

<table>
<thead>
<tr>
<th>Temperature (°F)</th>
<th>Psychrophiles</th>
<th>Mesophiles</th>
<th>Thermophiles</th>
<th>Hyperthermophiles</th>
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<tbody>
<tr>
<td>15</td>
<td></td>
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<tr>
<td>50</td>
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<td>70</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>-10</th>
<th>10</th>
<th>20</th>
<th>40</th>
<th>65</th>
<th>75</th>
<th>120</th>
</tr>
</thead>
</table>

16. **The Hot Compost Pile**

![Image of a compost pile with high temperatures]

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May 2010
17. **Typical Compost Heating Cycle**

- Tremendous microbial activity produces heat.
- At ~130°F, most plant and animal pathogens and weed seeds die.
- Eventually some resource will become limiting: simple foods, oxygen, or nitrogen will be used up and microbial activity (and temperature) will drop off.

![Graph showing temperature vs. time for compost heating cycle]

18. **Cold – Sheet composting**
   - Photos essay describing how to Sheet composting

19. **Vermicomposting**
   - How do you know what side of a worm is its head?
   - Photos essay describing how to vermicomposting

20. **Rain Sponges**
    - Photos essay describing how to Rain Sponges

21. **Sheet Composting**
    - Photos essay describing how to Sheet Composting
22. Compost Tea
   a. Photos essay describing how to Compost Tea

23. The Other Option Landfilling
   a. Food and yard waste account for at least 25% of landfill materials
   b. CO2 impact from edible food waste per person equates to taking 1 to 4 cars off the road
   c. CO2, methane (CH4), and nitrous oxide (N2O) generates as organic waste decays in landfills
   d. CH4 21 times worse and N2O 300 times worse than CO2
   e. Proper composting minimizes greenhouse gas emissions and extends life of landfills by saving space

24. Happy Composting –
   a. Closing thank you and encouragement
   b. For additional questions:
      i. Bernalillo County Master Composters
      ii. ABQ Master Gardeners

"The Nation that destroys its soil destroys itself"
- Franklin D. Roosevelt