Composting and Organic Matter: What are Organic Land Care Professionals Up To?

Soil School 2016
PCC Rock Creek

David Alba
PNW OLC
Project Coordinator
anaknialba@gmail.com
The Principles of Organic Land Care

The Organic Land Care Practitioner:

• Works with natural systems and processes to encourage and enhance biological diversity and native habitats;

• Optimizes and maintains the life supporting properties of soil, air and water;

• Utilizes renewable, biodegradable and recycled materials from local sources and minimizes waste;

• Considers the wider social and ecological impacts of landscapes and the practices and products used to create and maintain them.
What is the answer?
What is the question?
Add organic matter
### COMPOST TECHNICAL DATA SHEET

**Laboratory:** Soil Control Lab, 42 Hangar Way, Watsonville, CA 95076  
**Tel:** 831.724.5422  
**Fax:** 831.724.3188

<table>
<thead>
<tr>
<th>Compost Parameters</th>
<th>Reported as (units of measure)</th>
<th>Test Results</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant Nutrients:</td>
<td>%, weight basis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moisture Content</td>
<td>%, wet weight basis</td>
<td>57.4</td>
<td></td>
</tr>
<tr>
<td>Organic Matter Content</td>
<td>%, dry weight basis</td>
<td>40.3</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>units</td>
<td>7.33</td>
<td></td>
</tr>
<tr>
<td>Soluble Salts</td>
<td>dS/m (mmhos/cm)</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>Particle Size or Sieve Size</td>
<td>maximum aggregate size, inches</td>
<td>0.64</td>
<td></td>
</tr>
</tbody>
</table>

#### Stability Indicator (respiration)

- **CO₂ Evolution**
  - mg CO₂/g OM/day: 0.28  
  - mg CO₂/g TS/day: 0.11
  - Stability Rating: **Very Stable**

#### Maturity Indicator (bioassay)

- **Percent Emergence:** average % of control: 100.0
- **Relative Seedling Vigor:** average % of control: 107.4

#### Select Pathogens

- **Fecal coliform:** Pass
- **Salmonella:** Pass

#### Trace Metals

- **As, Cd, Cr, Cu, Pb, Hg:** Pass
- **Mo, Ni, Se, Zn:** Pass

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Participants in the US Composting Council’s Seal of Testing Assurance Program have shown the commitment to test their compost products on a prescribed basis and provide this data, along with compost end use instructions, as a means to better serve the needs of their compost customers.

**Laboratory Group:** Mar. 16 A  
**Laboratory Number:** 6030029-1/1  
**Analyst:** Assaf Sadeh  
**Website:** www.compostlab.com
## Compost Technical Data Sheet

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</tr>
</thead>
<tbody>
<tr>
<td><strong>Plant Nutrients:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitrogen: Total N</td>
<td>%, weight basis</td>
<td>0.53</td>
<td>1.2</td>
</tr>
<tr>
<td>Phosphorus: P&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt;</td>
<td>%, wet weight basis</td>
<td>0.20</td>
<td>0.45</td>
</tr>
<tr>
<td>Potassium: K&lt;sub&gt;2&lt;/sub&gt;O</td>
<td>%, dry weight basis</td>
<td>0.14</td>
<td>0.35</td>
</tr>
<tr>
<td>Calcium: Ca</td>
<td>%, dry weight basis</td>
<td>1.2</td>
<td>2.7</td>
</tr>
<tr>
<td>Magnesium: Mg</td>
<td>%, dry weight basis</td>
<td>0.16</td>
<td>0.38</td>
</tr>
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<td>57.4</td>
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<td>dS/m (mhos/cm)</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td><strong>Particle Size or Sieve Size</strong></td>
<td>% under 9.5 mm, dw basis</td>
<td>98.5</td>
<td></td>
</tr>
<tr>
<td><strong>Stability Indicators (respirometry)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO&lt;sub&gt;2&lt;/sub&gt; Evolution</td>
<td>mg CO&lt;sub&gt;2&lt;/sub&gt;-C/OM/dry</td>
<td>0.28</td>
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<td>100.0</td>
<td></td>
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<tr>
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<td>average % of control</td>
<td>107.4</td>
<td></td>
</tr>
<tr>
<td><strong>Select Pathogens</strong></td>
<td>PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.32(a)</td>
<td>Pass</td>
<td>Fecal coliform</td>
</tr>
<tr>
<td>Trace Metals</td>
<td>PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.15, Tables 1 and 3</td>
<td>Pass</td>
<td>As, Cd, Cr, Cu, Pb, Hg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Moll, Ni, Se, Zn</td>
</tr>
</tbody>
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Laboratory Group: Mar 16 A  
Laboratory Number: 6030029-1/1  
Analyzer: Assaf Sadch  
www.compostlab.com
| Trace Metals | PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.13, Tables 1 and 3. | Pass | As, Cd, Cr, Cu, Pb, Hg, Mo, Ni, Se, Zn |
OLC at the Washington State Capitol, East Campus
THE SCOOP & DUMP METHOD OF SOIL REMEDIATION

By

Miles S. Sax

PUBLIC GARDEN LEADERSHIP MPS
DEPT. OF HORTICULTURE
Urban Soils
Soil Descriptions

Inceptisols

Soils that are beginning to form and have weakly developed soil profiles. Inceptisols are most common in the Coastal Range, where they have dark, rich, undrained soils. On dunes, they are commonly developed on the north and west sides of the Willamette Valley and the Willamette Lowlands.

Ultisols

Red soils with strongly developed subsoils of clay and silt. Ultisols are mostly found in central and southern Oregon. They form from weakly developed soils that formed long ago when the climate was warmer and wetter. Ultisols are found on the north and west sides of the Willamette Valley and the Willamette Lowlands.

Alfisols

Soils that have the surface horizon and subsoil that are formed from clay. Alfisols occur mainly in the Willamette Valley and the Willamette Lowlands.

Andisols

Soils formed in areas of volcanic origin. Andisols are found in the Cascades and the Klamath Mountains.

Spodosols

Soils with white to gray, subsoils. Spodosols are found in areas of volcanic origin.

Histosols

Soils formed in areas of bog. Histosols are found in the Willamette Valley and the Klamath Mountains.

Aridisols

Soils formed in areas of desert. Aridisols are found in the Columbia Plateau.

Mollisols

Soils formed in areas of prairie. Mollisols are found in the Willamette Valley.

Vertisols

Soils with a high clay content. Vertisols are found in the Willamette Valley.

Entisols

Soils with a thin surface layer. Entisols are found in the Willamette Valley.

Note: The black line and areas are boundaries of soil types shown on the following pages.
California Soil Resource Lab
http://casoilresource.lawr.ucdavis.edu/soilweb/

California Soil Resource Lab – iPhone or Android app
http://casoilresource.lawr.ucdavis.edu/soilweb/

NRCS Web Soil Survey
http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm
Building and Maintaining Healthy Soil

45% mineral components

5% soil organic matter

50% pore space, which includes an even composition of air and water

Figure 4. Ideal soil composition includes 45% mineral components, 5% soil organic matter, and 50% pore space, which includes an even composition of air and water. Illustration by Creative Resource Strategies, LLC.
B – Bacteria
A – Actinomycetes
My – Mycorrhizae
H – Saprophitic fungus
N – Nematode
CP – Ciliate protozoa
FP – Flagellate protozoa
M – Mite

< 1mm
## Abundance of soil organisms

<table>
<thead>
<tr>
<th>Organism</th>
<th>Number per gram soil (~1 tsp)</th>
<th>Biomass¹ (lbs per acre 6”)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthworms</td>
<td>–</td>
<td>100 – 1,500</td>
</tr>
<tr>
<td>Mites</td>
<td>1-10</td>
<td>5 – 150</td>
</tr>
<tr>
<td>Nematodes</td>
<td>10 – 100</td>
<td>10 – 150</td>
</tr>
<tr>
<td>Protozoa</td>
<td>up to 100 thousand</td>
<td>20 – 200</td>
</tr>
<tr>
<td>Algae</td>
<td>up to 100 thousand</td>
<td>10 – 500</td>
</tr>
<tr>
<td>Fungi</td>
<td>up to 1 million</td>
<td>1,000 – 15,000</td>
</tr>
<tr>
<td>Actinomycetes</td>
<td>up to 100 million</td>
<td>400 – 5,000</td>
</tr>
<tr>
<td>Bacteria</td>
<td>up to 1 billion</td>
<td>400 – 5,000</td>
</tr>
</tbody>
</table>

¹ Biomass is the weight of living organisms

Slide Credit: Cara Molina
A Cost Comparison of Conventional (Chemical) Turf Management and Natural (Organic) Turf Management for School Athletic Fields
Charles Osborne and Doug Wood, March 2010
“Once established, a natural turf management program can result in savings of greater than 25% compared to a conventional turf management program.”
“Irrigation costs for turf maintenance are considerable, but are generally less for naturally maintained fields due to deep root growth and moisture retention by organic matter. Estimates of irrigation reduction for natural turf programs range from 33% to more than 50.”
Edible Landscaping
Sheet Mulching
Sheet Mulching
Chemicals that Willamette University used prior to 2004:

- Acclaim (H) – Post emergent control of grasses
- Attain TR (I) Kills insects in greenhouses
- Barricade (H) Kills crabgrass
- Bayleton (F) Controlled fungus
- Basagran T/O (H) Broadleaf Herbicide
- Balan DF (H) Broadleaf Herbicide
- Certainly (H) Broadleaf Herbicide
- Confront (H) Broadleaf Herbicide
- Crossbow (H) Nonselective Herbicide
- Casoron 46 (H) pre-emergent Herbicide
- Cygon 2E (I)
- Pennant Magnum (H) Herbicide
- Duraplex TR (I) for greenhouses
- Daconil Utrex (F) fungicide
- Amine 4 2,4D (H) Herbicide
- Team 2G (H) Pre-emergent grass K.I.
- Talstar (I) for ant control
- Dursban (I) insecticide
- Drive (H) controls grasses
- Eagle (F) Fungicide
- Glyfos extra (H) non-selective Herbicide
- Funginex (F) Roses
- Final (H) Broadleaf herbicide
- Fusilade 2000 (H) Controls annual grasses
- Gallery (H) Broadleaf herbicide
- Gallitrol (F) controls galls
- Garlon 4 (H) Herbicide for woody plants
- Heritage (F) Fungicide for turf
- Invigorate – Soil conditioner
- Immunox (F) Roses
- Merit (I) Insect control
- Manage (H) controls nutsedge
- m-pede (I)
- Orthene (I)
- Oust (H) Broadleaf H
- Prograss (H)
- Pendulum (H) Broadleaf
- Pennant Magnum (H)
- Reward (H) Aquatic weed Control
- Round-Up (H)
- Rubigan EC (F)
- Surge (H) Broadleaf
- Syl – Tac Surfactant
- Speedzone (H) Broadleaf
- Scythe (H) Weed burner
- Velocity (H) post-emergent for broadleaf
- Vapan HL soil fumigant
- Endeavor (I) Insecticide
Managing Weeds, Disease and Pests Organically
Case-Study: Willamette University

Wednesday, May 11th, 2016
8:30 – 11:30am
Willamette University, Salem, OR

David Alba
Project Coordinator
anaknialba@gmail.com