The US Composting Council’s Seal of Testing Assurance Program:

(How to Tell What Compost “is”)

Matthew Cotton
US Composting Council
Many feedstocks, production methods, technologies, test methods, units of measure, lab result forms….

The ‘industry’ and end users need continuity!
If it isn’t STA Compost…… What is it?
WHAT IS IT?

- Compost testing and information disclosure program (logo program)

PURPOSE...

- To improve customer confidence in compost selection
- To enhance compost’s position as a mainstream horticultural, agricultural and retail product
- To distinguish “compost” from other organics products
STA PROGRAM GOALS:

• To improve customer confidence in compost selection (and utilization)
• To improve overall customer satisfaction, as well as ‘field’ results
• To improve compost purchasing decisions
• To promote customer-oriented composters
• Move industry towards standardized test methods
Promoting.....

...the appropriate product for a particular project, allowing for optimal ‘field’ results
Promoting the proper use of compost products, reduces failures in the ‘field’ – Which hurts end users and composters!
BASICS - *Participating Composters will:*

- Complete on-going product testing
  - operate on-going sampling/testing regime
  - using uniform sampling and analytical testing methods (from the TMECC)
  - using only STA Program certified labs (list on website)
- Disclose test data results (lab analyses) and provide appropriate end use instructions to end users

* Treat compost like any other retail, horticultural, agricultural product marketed in the U.S.*
KEY PROGRAM ELEMENTS:

- Specific compost information will be disclosed to customers (and the USCC) using a standardized form (*Compost Technical Data Sheet*)
  - Compost test analysis results
  - List of compost ingredients
  - End use instructions
**COMPOST TECHNICAL DATA SHEET**

<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></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitrogen</td>
<td>%, weight basis</td>
<td>.72</td>
<td>1.12</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>%, weight basis</td>
<td>.13</td>
<td>.21</td>
</tr>
<tr>
<td>Potassium</td>
<td>%, weight basis</td>
<td>.32</td>
<td>.50</td>
</tr>
<tr>
<td>Calcium</td>
<td>%, dry basis</td>
<td>.24</td>
<td>.64</td>
</tr>
<tr>
<td>Magnesium</td>
<td>%, dry basis</td>
<td>.57</td>
<td>.89</td>
</tr>
<tr>
<td>Moisture Content</td>
<td>%, dry weight basis</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Organic Matter Content</td>
<td>%, dry weight basis</td>
<td>31.31</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>unitesless</td>
<td>7.4</td>
<td></td>
</tr>
<tr>
<td>Soluble Salts (electrical conductivity)</td>
<td>dS/m (mmhos/cm)</td>
<td>3.49</td>
<td></td>
</tr>
<tr>
<td>Particle Size</td>
<td>screen size passing through 1/4&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stability Indicator (respiration)</td>
<td>mg CO2-C/g TS/day, and</td>
<td>.14</td>
<td></td>
</tr>
<tr>
<td>CO2 Evolution</td>
<td>mg CO2-C/g OM/day</td>
<td>.9</td>
<td></td>
</tr>
<tr>
<td>Maturity Indicator (time in days)</td>
<td>average % of control, and</td>
<td>92</td>
<td></td>
</tr>
<tr>
<td>Percent Emergence and Relative Seedling Vigor</td>
<td>average % of control</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>Select Pathogens</td>
<td>Pass/Fail: per US EPA Cham A standard, 40 CFR § 503.31a</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>Trace Metals</td>
<td>Pass/Fail: per US EPA Cham A standard, 40 CFR § 503.13, Table 1 and 3</td>
<td>Pass</td>
<td></td>
</tr>
</tbody>
</table>

**Directions for Product Use:**

- **New Lawns:** Apply a 1-2" layer to soil and incorporate to a depth of 5-7", apply seed, then rake and water.
- **Flower Beds:** Apply a 1-2" layer to soil and incorporate to a depth of 6-8". Condition soil this way every year to 2 years. Plate flowers and water.
- **Trees & Shrubs:** Dig a hole 2/3 the depth of the root ball and at least twice as wide. Mix 1 part compost with 2 parts soil obtained from the planting hole. Place the tree or shrub in the planting hole and apply amended soil around the root ball. Firm soil occasionally and water.
- **Topsoil Manufacturing/Upgrading:** Mix 1 part compost with 2 parts existing or purchased soil and blend uniformly.
- **Growing Mixes:** Planter box or raised bed mixes can be produced by mixing 1 part compost to 1 part pine bark and 1 part soil, sand or expanded shale. Potting mixes should contain 1 part compost, 1 part peat moss or pine bark, and 1 part perlite, vermiculite, styrofoam, or other aggregate.
- **Mulching:** Spread a 2-3" layer around trees, shrubs, and flowers. Always avoid placing mulches against plant trucks and scions.
- **Garden Beds (food crops):** Apply a 1-2" layer to soil and till to a 6-8" depth. Reapply each year, or as per soil test recommendations.

**Note:** The USCC does not assess whether or not, or to what extent, these directions are sound, sufficient or otherwise appropriate. It is the participant's responsibility alone to ensure that they use.

**Compost Ingredients:**

Yard trimming, food by-products

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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.

This compost product has been sampled and tested as required by the Seal of Testing Assurance Program of the United States Composting Council (USCC), using certain methods from the “Test Methods for the Examination of Compost and Composting” manual. Test results are available upon request by calling Barnes Nursery at 800-421-8722. The USCC makes no warranties regarding this product or its contents, quality, or suitability for any particular use.

For additional information pertaining to compost use, the specific compost parameters tested for within the Seal of Testing Assurance Program, or the program in general, log on to the US Composting Council's TMECC web-site at http://www.tmecc.org.
**COMPOST TECHNICAL DATA SHEET for Texas DOT**

<table>
<thead>
<tr>
<th>Compost Parameters</th>
<th>Test Results</th>
<th>Reported as (units of measure)</th>
<th>TMECC Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic Matter Content</td>
<td>45.8%</td>
<td>% dry weight basis</td>
<td>05.07-3A Loss on Ignition Organic Matter Method (G5)</td>
</tr>
<tr>
<td>pH</td>
<td>6.28</td>
<td>Units</td>
<td>04.13-3A 1.5 Slurry pH</td>
</tr>
<tr>
<td>Soluble Salts (electrical conductivity)</td>
<td>2.98</td>
<td>1/50th (molar)</td>
<td>04.10-3A 1.5 Slurry Method Mass Basis</td>
</tr>
<tr>
<td>Particle Size</td>
<td>97.0%</td>
<td>% dry weight passing through</td>
<td>02.02-R Sample Sieving for Aggregate Size Classification</td>
</tr>
<tr>
<td></td>
<td>94.9%</td>
<td>3/4&quot; inch screen and 3/8&quot; inch screen</td>
<td></td>
</tr>
<tr>
<td>Stability Indicator</td>
<td>0.43</td>
<td>mg CO2-C/kg OM/day</td>
<td>05.04-3A Carbon Dioxide Evolution Rate</td>
</tr>
<tr>
<td>CO2 Evolution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maturity Indicator</td>
<td>100</td>
<td>average % of control</td>
<td>05.05-3A Germination and vigor Evolution rate</td>
</tr>
<tr>
<td>Percent Emergence</td>
<td>100</td>
<td>average % of control</td>
<td>05.05-3A Germination and vigor Evolution rate</td>
</tr>
<tr>
<td>Relative Seedling Vigor</td>
<td>100</td>
<td>average % of control</td>
<td>05.05-3A Germination and vigor Evolution rate</td>
</tr>
<tr>
<td>Select Pathogens (Final Citrate)</td>
<td>Pass</td>
<td>PASS/FAIL: Per US EPA Class A standard, 40 CFR 793.32(d)</td>
<td>07.01-B Final solids</td>
</tr>
<tr>
<td>Trace Metals</td>
<td>Pass</td>
<td>PASS/FAIL: Per US EPA Class A standard, 40 CFR 793.32(d)</td>
<td>04.04-Hazardous Metals standard, and Hazardous Elements</td>
</tr>
</tbody>
</table>

**Laboratory Batch Number:** Nov-3-02  
**Laboratory Number:** 167917112934  
**Analyst:** Frank Shields

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**COMPOST TECHNICAL DATA SHEET for Washington State DOT Projects**

<table>
<thead>
<tr>
<th>Compost Parameters</th>
<th>Specification Requirements</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size Classification</td>
<td>% dry weight passing through</td>
<td></td>
</tr>
<tr>
<td>SIEVE SIZE</td>
<td>Fine</td>
<td>Coarse</td>
</tr>
<tr>
<td>2&quot;</td>
<td>100</td>
<td>90 - 100</td>
</tr>
<tr>
<td>1&quot;</td>
<td>90 - 100</td>
<td>40 - 60</td>
</tr>
<tr>
<td>Maximum Particle Length</td>
<td>6&quot;</td>
<td>12&quot;</td>
</tr>
</tbody>
</table>

**Laboratory Batch Number:** 8-0  
**Laboratory Number:** 167917112934  
**Analyst:**

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*Customized for DOT inspectors, project managers ….
KEY PROGRAM ELEMENTS:

- Participants will regularly sample and test their product using standardized protocols.
  - Testing frequency is based on the volume of compost produced:
    - 1-6,250 tons: 1 per quarter
    - 6,251-17,500 tons: 1 per 2 months
    - 17,501 tons and above: 1 per month
KEY PROGRAM ELEMENTS:

- Participants will test for various parameters
  - pH, soluble salts, nutrients (N,P,K,Ca,Mg), moisture, organic matter, maturity (bioassay), stability (respirometry), particle size, pathogens & trace metals
  - All products will be required to meet 503 pathogen and trace metal requirements, as well as any state requirements
KEY PROGRAM ELEMENTS:

- Compost testing will be performed at STA Program approved labs
- Approved labs are required to use test method protocols from the TMECC manual and participate in the Compost Analysis Proficiency Program
  - Administered by Utah State University and managed by Bob Miller of Colorado State University
STA Approved Labs

- Ag Analytical Services Lab – State College, PA
- A&L Canada Labs – London, Ontario
- A&L Great Lakes Labs, Inc. – Ft. Wayne, IN
- Colorado Analytical Lab – Brighton, CO
- Energy Laboratories, Casper, WY
- Soil Control Laboratory – Watsonville, CA
- Tarleton State University, Stephenville, TX
- Woods End Research Lab – Mt. Vernon, ME
Use proper sampling procedures, chain of custody form
TMECC History

- **1st Draft of TMECC: 1995**
  - Developed during MN-CUP Project, 1993
- **TMECC Enhancement**
  - Added methods and parameters
- **Peer-Review of TMECC: 1998-2000**
  - Recruited 9 experts as team leaders
  - 71 experts participated in review
- **USDA’s Working Draft: August 2001**
  - USGPO editorial review completion: 2002
KEY PROGRAM ELEMENTS:

- Participants can use the program logo in their in-house promotional activities.
- Participants will be included in program sponsored educational activities.
Work with Specifying Organizations and Companies

RMRC / AASHTO
EPA
DOTs
Articles
Other Benefits

- Acts as a framework to allow the implementation of established numerical product specifications
- Assists in the implementation of an inspection or quality verification program
- Can serve a quality control function (and provide promotional benefits) for composters
- Standardizes a set of test parameters (and methods) for use in evaluating compost product quality
Seal of Testing Assurance Program
Program ‘Stats’ – 8/06

- Companies in the STA Program = 103
- Compost Products in the STA Program = 137
- Compost volume in the STA Program = Approx. 2,429,290 tons, or
  Approx. 4,858,580 cubic yards
- States with STA participants = 29
- Labs in STA Program = 8
California Participants

- BFI of Northern California – Milpitas
- CCL Organics LLC – Benicia
- Engel & Gray, Inc. – Santa Maria
- Grover Environmental – Modesto
- Norcal Waste Systems – Marysville, Vacaville, Gilroy
- San Joaquin Composting Inc. - Lost Hills
- Sun-Land Garden Products - Watsonville
- Synagro – Corona
- Z-Best Products - Gilroy
State DOTs Requiring STA Certification

- California
- Georgia
- Iowa – pending
- New York State – pending
- Pennsylvania
- Texas
- Washington State
US Composting Council
Seal of Testing Assurance Program

If it isn’t STA Compost…what is it?

Contact: Al Rattie, 215-258-5259
Ron Alexander, 919-367-8350
Program Managers
You’re Not Alone!

- Compost use by DOTs in landscaping and erosion control applications has become widespread
  - Have been excellent field results
- STA requirement is becoming more popular with ‘specifying’ agencies

EXAMPLES
DOT ‘Soil Amendment’
Compost Use Data

- 31 states with compost, or related, specs
- 26 spec for soil amending and topsoil manufacturing, 11 for planting backfill
- Specify by name (compost) or through “special provisions”
- Allow various feedstocks (some restrict)

(2001 data)
Many Applications
DOT ‘Erosion Control’
Compost Use Data

• 10 states allow compost, and related products, for erosion control
  – CA, CT, ID, ME, MI, MT, OR, TX, VA, WA
• Allow various feedstocks
  – Yard trimmings (7), biosolids (5)
  – Food, manure, agricultural residuals (3)
  – Wood, forestry residuals, unspecified (on list) (2)
  – MSW (1)

(2001 data)
California Erosion Control Research

- 1993 – Evaluation of Compost on Landscaped Freeway Roads (Caltrans)
- 2000-2005 – Various Roadside Vegetation and Management Studies (Cal Poly State University)
- 2002 Use of Compost and Co-Compost as a Primary Erosion Control Material (Univ. of California, Davis)

Lots of research to justify/back-up the use of compost in erosion control (and many other roadside) applications
Successful Compost Erosion Control States

- California
- Iowa
- Maine
- Minnesota
- Oregon
- Texas
- Virginia
- Washington
Compost Usage of Compost in Erosion and Sediment Control

Started with Compost Blanket Applications

Clyde Walton
Maine DOT – Maintenance & Construction responsibilities
Compost Filter Berms, then Socks
Standard Specifications for
Compost for Erosion/Sediment Control

- Compost Blankets MP-10
- Filter Berms MP-9

American Association of State Highway and Transportation Officials
444 North Capitol Street N.W., Suite 249
Washington, D.C. 20001
Landmark Dates

- Maine DOT – usage dates back to 1989 (RCS)
- Portland Metro research and report (W&H Pacific) – 1993/4
- University of CT berm research – 1998-2001
- AASHTO blanket and berm specifications (RMRC report) – 2003
- USEPA endorse specifications – 2006
- AASHTO filter sock specification - 2006
The Texas Experience

Barrie Cogburn
Landscape Architect
TxDOT Design Division

Scott McCoy
Program Specialist
TNRCC
Item 1027: “Furnishing & Placing Compost”
- Erosion Control Compost
- General Use Compost
- Compost for Manufactured Topsoil

Item 1034: “Mulch/Compost Filter Berm for Erosion & Sedimentation Control”
Special Specification Item 1027:
“Furnishing & Placing Compost”

- Erosion Control Compost
- General Use Compost
- Compost for Manufactured Topsoil
Having great success, and wanted to protect it.
Changes to the TxDOT Specification

- No more Solvita field test
- TMECC test methods
- All compost must be Seal of Testing Assurance certified
Item 1058 Compost

Provide compost meeting all applicable United States Code of Federal Regulations (CFR), Title 40, Part 503 standards for Class A biosolids and Texas Commission on Environmental Quality (TCEQ) health and safety regulations as defined in the Texas Administrative Code (TAC), Chapter 332, including the time and temperature standards in Subchapter B, Part 23. Meet the requirements of the USCC Seal of Testing Assurance (STA) program.
Before delivery of the compost, provide QC documentation that includes the following:

- the feedstock by percentage in the final compost product,
- a statement that the compost meets federal and state health and safety regulations,
- a statement that the composting process has met time and temperature requirements,
- a copy of the producer’s STA certification, and
- a copy of the lab analysis, performed by an STA-certified lab, verifying that the compost meets the requirements of Table 1.
Dear Sirs/Madam,

In accordance with the Texas Department of Transportation (TxDOT) Special Specification Item 1027, "Furnishing and Placing Compost", I affirm the following under (A) through (E) Documentation:

(A) The compost contains a minimum of 65% by volume of recycled materials.

(B) A list of feedstock by percentage in the final compost product:
1.
2.
3.
4.

(C) The compost meets federal and state health and safety regulations.

(D) The compost meets time and temperature requirements.

(E) A copy of the lab analysis less than 3 months old and that the compost meets the physical requirements described in Table 1 in Special Specification Item 1027.

Scott Compost, President ABC Compost Specialist

Signature Before a Notary Public

Notary Public Signature and Seal

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### COMPOST TECHNICAL DATA SHEET for Texas DOT

<table>
<thead>
<tr>
<th>Compost Parameters</th>
<th>Test Results</th>
<th>Reported as (units of measure)</th>
<th>TMEC Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic Matter Content</td>
<td>45.8%</td>
<td>% dry weight basis</td>
<td>05.07-A Loss-on-Ignition Organic Matter Method (LOI)</td>
</tr>
<tr>
<td>pH</td>
<td>6.28</td>
<td>Untested</td>
<td>04.11-A 1.5 Stirred pH</td>
</tr>
<tr>
<td>Soluble Salts (electrical conductivity)</td>
<td>2.98</td>
<td>dS/m (cmhos/cm)</td>
<td>64.10-A 1.5 Stirred Method Mass Basis</td>
</tr>
<tr>
<td>Particle Size</td>
<td></td>
<td>% dry weight passing through 5/8th inch screen and 3/8th inch screen</td>
<td>02.02-B Sample Sieving for Aggregate Size Classification</td>
</tr>
<tr>
<td>Stability Indicator (respiration)</td>
<td>0.43</td>
<td>mg CO2-Cig OM/day</td>
<td>05.08-B Carbon Dioxide Evolution Rate</td>
</tr>
<tr>
<td>CO2 Evolution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maturity Indicator (biomass)</td>
<td>100</td>
<td>average % of control</td>
<td>05.05-A Commination and vigor Evolution rate</td>
</tr>
<tr>
<td>Percent Emergence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative Seedling vigor</td>
<td>100</td>
<td>average % of control</td>
<td>05.05-A Commination and vigor</td>
</tr>
<tr>
<td>Select Pathogens (Fecal Coliforms)</td>
<td>Pass</td>
<td>PASS/FAIL: Per US EPA Class A standard, 40 CFR 503.32(p)</td>
<td>07.01-B Fecal coliforms</td>
</tr>
<tr>
<td>Trace Metals</td>
<td></td>
<td>PASS/FAIL: Per US EPA Class A standard, 40 CFR 503.33, tables 1 and 3, and Heavy Metal</td>
<td>64.96 Heavy Metals standard, and Hazardous Elements</td>
</tr>
</tbody>
</table>

Laboratory Batch Number: Nov-02-02 Laboratory Number: 167917112934
Analyst: Frank Shields
STA Certified Compost Suppliers in Texas

Angelina & Neches River Authority  
Back to Nature, Inc.  
Black Gold Compost  
City of Denton  
City of Plano  
Garden Success, Inc.  
Garden-Ville  
Geosource, Inc.  
Living Earth Technologies  
Natural Fertilizer Company  
New Earth LLC  
O’Neal’s Compost  
Organic Residuals Reclamation, LLC  
R.J. Smelley Company  
Texarkana Water Utilities

*Composter Certification is Tracked by TxDOT on USCC/STA websites
Types of Composts Being Utilized by TxDOT

- Yard Waste: 15%
- Animal Manures: 35%
- Yard waste/ Biosolids: 50%

TxDOT tracks usage and success
Cubic Yards of Compost Specified (FY)

- FY 2001
- FY 2002
- FY 2003
- FY 2006
Seal of Testing Assurance Program

TEXAS GROWTH

2000 – 2002
• 4 composters

2003
• 19 new
• 23 total

2004
• 8 new
• 31 total

2006
• 8 new
• 39 total

2002 AASHTO President’s Transportation Award

Build it and they come (join)
Taking similar steps in CA.

- BFI of Northern California – Milpitas
- CCL Organics LLC – Benicia
- Engel & Gray, Inc. – Santa Maria
- Grover Environmental – Modesto
- Norcal Waste Systems – Marysville, Vacaville, Gilroy
- Rossi Transport Service – Templeton
- San Joaquin Composting Inc. - Lost Hills
- Sun-Land Garden Products - Watsonville
- Synagro - Corona
Costs for Participation

• Annual participation fee of $650/non USCC member, $500/member + testing costs ($300 - $400/sample)
  – Participation fee covers program management and promotional activities

• Cost estimates
  – 10,000 yd³ composting facility - $.12 - .20/yd³
  – 50,000 yd³ composting facility - $.05 - .10/yd³
MAKE PLANS NOW TO ATTEND THE 15TH ANNUAL CONFERENCE IN ORLANDO, FLORIDA! JANUARY 2007!
The Largest Composting Conference and Exhibition Targeted for the Composting, Wood Waste, and Organics Recycling Industry in North America
The Only Composting Conference and Exhibition Run by and for Composting and Wood Waste Professionals

Exhibitor Information, Equipment Demonstration Opportunities, Sponsorship Opportunities & Registration Forms are available at www.compostingcouncil.org or call the USCC at 631-737-4931

CURRENT CONFERENCE SPONSORS
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Specialized Environmental Technologies  Composting News  A-1 Organics
Resource Recycling Magazine  BASF  ALLU Group
MSW Management Magazine  Cedar Grove Composting  Synagro
Heritage Bag Company  Scarab Manufacturing  Garick Paygro Division
BioCycle  Filtrex International  Barnes Nursery, Inc
Continental Biomass Industries  Amadas Industries  ROTO-MIX