

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Welcome and Overview

Composting is a biological process in which microorganisms convert organic matter into a stabilized, humus-like substance. Many of the organic materials used for composting in their raw form are inappropriate for use on land or around living organisms. Composting helps to break down organic residues, stabilize nutrients, destroy weed seeds, and control possible toxins or disease. Once through the proper process, the resulting compost has various horticultural and agronomic benefits and is environmentally safe for use on soils around plants, humans, and animals.

During the compost process, high temperatures (often up to 150°F) kill any bad bacteria and microbes that may be in the biosolids, creating a safe product that can be used for all applications. Compost has many beneficial uses. It improves soil aeration, soil drainage, the water-holding capacity of sandy soils, the percentage of organic matter in soils, and the ability of soils to absorb and hold nutrients. In Florida, soil fertility is an

important component of why many choose to use compost to replenish the soil to make it a healthy, productive environment for plants, trees, and crops to grow and mature. ECUA began biosolids composting operation in the fall of 2015 at our Central Water Reclamation Facility (CWRP) in Cantonment, FL. The compost facility combines ground yard waste collected throughout the community with biosolids produced from the CWRP to create an optimal blend of material that facilitates composting and generates a nutrient-rich final product.

To reduce inorganic contamination in the compost, ECUA launched a campaign in mid-2015 encouraging residents to place yard waste in brown paper bags, which are compostable, instead of non-compostable plastic bags. Screened finished compost is expected to be produced in the spring of 2016. ECUA invites you to procure and use our high quality finished biosolids compost or become a trial partner with us.

Our compost is certified by the US Compost Council (USCC) Seal of Testing Assurance (STA) Program, so you can be assured that it is regularly tested in accordance with industry approved methods at certified laboratories and that the results are made available to the public. In addition, the compost meets all state and federal requirements for high-quality (Class AA) biosolids compost. The finished compost is tested regularly and has been found to be of a high quality, mature and very stable, and with very high organic matter content. Germination and growth (vigor) tests showed excellent results.

Compost from ECUA contains a full spectrum of essential plant nutrients and can help any type of soil to both hold more water and drain more efficiently. It can reduce or eliminate the need for chemical fertilizers, potentially saving money and protecting our waters. Plus, you help us keep yard waste out of the landfill and assist in providing a beneficial use for our biosolids, helping the sustainability of our community.

**We welcome you to contact ECUA
for additional information.**

Amanda Handrahan
Recycling Coordinator
Emerald Coast Utilities Authority
(850) 969-6606
amanda.handrahan@ecua.fl.gov



Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Facility Fact Sheet

Facility Location:

ECUA's Central Water Reclamation Plant
2980 Old Chemstrand Rd., Cantonment, FL 32533

Facility Contact:

Name: Amanda Handrahan
Phone: (850) 969-6606
Fax: (850) 944-1626
Email: Amanda.handrahan@ecua.fl.gov
Website: <http://www.ecua.fl.gov/>

Hours of Operation:

7:00 AM to 5:00 PM – Monday through Friday

Tour Request:

Amanda Handrahan, Recycling Coordinator,
(850) 969-6606,
amanda.handrahan@ecua.fl.gov

Feedstocks Used:

- Biosolids from ECUA's Central Water Reclamation Plant
- Ground Yard Waste

Source of Feedstock(s):

- Escambia County Municipal Wastewater
- Commercial Yard Waste
- Residential Waste

Facility Description:

Size: 20 acres

Daily Capacity:

- 80 tons of biosolids
- 400 cubic yards of ground yard waste

Process used:

Modified Static Aerobic Pile (MSAP) Method

Process Description:

Turning Method:

- Mechanical windrow-turner

Typical C:N Ratio:

- Starting mix ~25:1
- Finished Compost <20:1

Number of Full-time Employees: 3

Year Operation Began: 2015

Annual compost production

15,000 tons (30,000 cubic yards)

Target Market for Finished Product:

- County Residents
- Landscape Contractors
- Nurseries
- Agricultural Applications
- Turf Grass Maintenance
- Environmental Applications (erosion control, wetland restoration, stormwater filtration)

Products:

- Mulch (1"-2")
- Compost (3/8"-1/2")
- Fine Compost (1/4"-3/8")



Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Product Price Sheet

ECUA is pleased to offer *Bloom – the most in Bio-Compost* for sale in bulk quantities. Compost is sold by the CY, and the price is based on the volume purchased, according to the following schedule:

Volume	Standard Compost		Fine Compost	
	Picked up	Delivered	Picked up	Delivered
0-10 CY	\$10/CY	\$12/CY	\$20/CY	\$22/CY
10-40 CY	\$7/CY	\$9/CY	\$14/CY	\$16/CY
40+ CY	\$4/CY	\$6/CY	\$10/CY	\$12/CY
1000+ CY per month*	\$3.50/CY	Not available	\$8/CY	Not available



The standard compost is screened through a 5/8” screen and is ideal for most uses. The fine compost is screened through a 1/4” screen and is ideal for topdressing on lawns and turf grass.

If you would like to run a trial with the compost prior to committing to large scale usage, ECUA will offer you a one-time discounted rate at the 40+CY price regardless of the volume purchased.

Compost can be picked up at the Biosolids Compost Facility located at 2980 Old Chemstrand Rd., Cantonment, FL 32533. Passenger vehicles and pickup trucks are not permitted on the site. You must use a commercial-sized vehicle for picking up compost. ECUA can also deliver compost for a fee of \$2/CY.



* This rate is only available if you sign a contract with ECUA to order 1000 CY or more per month. ECUA cannot deliver orders over 1000 CY.

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

US Composting Council's Seal of Testing Assurance (STA) program



The US Composting Council's Seal of Testing Assurance (STA) Program is a compost testing, labeling and information disclosure program designed to give you the information you need to get the maximum benefit from the use of compost. The program was created in 2000 and is the consensus of many of the leading compost research scientists in the United States. Previously, there was no other compost testing program available to compost

producers or compost buyers that give you this type of information.

The science behind the development of the STA Program and the various tests that are used is contained in Test Methods for the Examination of Composting & Compost (TMECC). This publication includes a suite of physical, chemical and biological tests. These were selected to help both compost producer and purchaser to

determine if the compost they are considering is suitable for the use that they are planning, and to help them compare various compost products using a testing program that can be performed by a group of independent, certified labs across the country and in Canada. There are nearly 300 participants in the US and nine in Florida, soon to be 11. (Source: <http://compostingcouncil.org/seal-of-testing-assurance/>)



Requirements of the program:

All composting facilities in the STA Program must:

- Be permitted
- Regularly test compost at an STA-certified lab
- Provide a compost technical data sheet to all who request it, which includes:
 - Detailed directions for product use
 - List of product ingredients
 - Lab test results

Testing parameters:

- Compost must be tested for the following parameters:
- Pathogens: Fecal coliform and/or Salmonella
 - Heavy metals: Arsenic, Cadmium, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Zinc
 - Nutrient content: Total nitrogen, phosphate, potash (potassium), calcium, and magnesium
 - pH
 - Soluble sales
 - Moisture content
 - Organic matter content
 - Maturity
 - Stability



QR code for packaging

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Modified Static Aerobic Pile (MSAP) – Composting Method Used by ECUA

History of the MSAP Method:

- 2000: The MSAP method was developed by Harvest Quest International, Inc. working with A1 Organics in Colorado as a way to reduce windrow management costs and prevent potential odor problems as residential populations around A1's compost sites grew.
- 2001: The MSAP method was approved by EPA Region 8 and the State of Colorado as an approved method for reducing pathogens in biosolids to produce Class A biosolids compost.
- 2003: The MSAP method was successfully demonstrated in California and subsequently approved by EPA Region 9 and the State of California.



- 2009: The MSAP method process received approval for EPA Region 4 and the Florida Department of Environmental Protection.
- 2015: ECUA began using the MSAP method to compost biosolids and yard waste.

How Does the Process Work?

- Biosolids and yard waste are mixed in approximately a 3:1 volumetric ratio. This ratio has been shown to be optimal for moisture, porosity, carbon-to-nitrogen ratio, and temperature.
- The mixture is laid out in windrows, which are basically elongated piles, 7-8' tall and 16-20' wide.
- A specialized inoculant is added on top of the mix. The inoculant is a natural blend of bacteria and fungi that act as a catalyst that greatly speeds up the compost.
- A layer of ground yard waste is then added on top of the pile to allow the catalyst to grow and spread and also acts as a natural biofilter to reduce any odors.
- Underneath this layer of ground yard waste, the bacteria and fungi in the inoculant spreads rapidly. In fact, they can spread up to 24 feet in a single day.
- As they multiply across and into the compost, the microbes essentially siphon oxygen into the pile. Unlike traditional compost methods, that heat from the inside out, the MSAP method heats from the outside in, due to the inoculant. This causes the pile to quickly heat up to pathogen-killing temperatures and maintain these temperatures for several weeks.

- After about 30 days, the windrows are turned with a compost turner. This redistributes moisture throughout the pile and fluffs the material to facilitate further decomposition.
- After another 14 days, the windrows are turned a second time.
- Compost is then screened into the finer particles (finished compost) and larger woody waste that has not yet fully degraded (overs). The overs will be reincorporated into future compost or sold as mulch.
- The finished compost then cures for about 14 days before it is ready to be used.

What are the Benefits?

- Cost savings – The MSAP process only requires 2 turnings, compared to 5 turnings for traditional turned windrows, which saves on labor, fuel, and equipment maintenance costs.
- Reduced odors – The fewer turnings reduces odors since turning the windrow often releases any odor generated within the pile. The capping layer of yard waste that sits on the pile during the first 30 days also significantly reduces odors.
- Saves space – The inoculant greatly speeds up the compost process meaning more material can be composted on smaller area of land.

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Test Result Tables (February 2016)

Nutrients	ECUA's compost (as received)	ECUA's compost (dry weight)
	Total Nitrogen (N)*	0.75%
Organic Nitrogen	0.72%	1.68%
Ammonium Nitrogen	0.035%	0.082%
Nitrate Nitrogen	-	
Total Phosphate (P2O5)*	0.50%	1.18%
Total Potash (K2O)*	0.19%	0.45%
Sulfur	0.09%	0.21%
Calcium	0.69%	1.63%
Magnesium	0.10%	0.24%
Sodium	0.02%	0.05%
Iron	1510 ppm	3556 ppm
Manganese	133 ppm	313 ppm
Boron	<20 ppm	-

*Fertilizer labeling expresses nitrogen, phosphorus, and potassium as total nitrogen, total phosphate, and total potash, respectively.

Heavy Metals	Parameter	ECUA's compost	Class AA Limits
	Arsenic	2.73	41
Cadmium	Not detected	39	
Copper	48.3	1500	
Lead	Not detected	300	
Mercury	0.14	17	
Molybdenum	2.6	N/A	
Nickel	4.0	420	
Selenium	Not detected	100	
Zinc	130.7	2800	

All units are expressed as mg/kg on a dry weight basis. Limits for Class AA biosolids are from 62-640.700(5) (b) F.A.C.

Pathogens	Parameter	ECUA's compost	Allowable Limits
	Salmonella	<0.01	3
Fecal Coliform	<2	1000	

Salmonella concentration is expressed as most probable number (MPN/4 g) and fecal coliform concentration is expressed as MPN/g, both on a dry weight basis. The allowable limits are from 40 CFR 503.32, as adopted by the Florida Department of Environmental Protection for Class AA biosolids. (62-640.600(1) (a) F.A.C.

Compost Quality Parameters	Units	Preferred	Acceptable	ECUA's compost	Notes:
	Stability	mg CO2-C per g OM per day	<2	<4	0.09
Maturity	% seed emergence & vigor	90-100%	80-100%	80%	The higher the percentage, the more versatile the produce
Moisture Content	% wet weight basis	40-50%	35-65%	57.54%	Products with higher moisture content may be used. They may simply be more difficult to apply.
Organic Matter	% dry weight basis	35-60%	25-65%	48.52%	Soil itself contains 5%-10% organic matter and is desirable in well drained soils.
Particle size	Screen size to pass through	*	*	<1/2"	* Desired particle size depends on usage: • Lawn topdressing: 1/4"-3/8" • Planting: 3/8"-1/2" • Mulch: 1"-2"
pH	pH units	6.0-7.5	5.5-8.5	6.7	Modify soil pH with lime, etc., if necessary, based on soil testing results.
Soluble salts (Electrical Conductivity)	dS/m (mm-hos/com) dry weight basis	<5.0	<15.0	1.22	Keep in mind that most soluble salts are also plant nutrients. Compost containing a higher soluble salt content should be applied at lower application rates and watered in well.
Physical Contaminants	% dry weight basis	<0.5%	<1.0%	None detected	Small stones may be deemed more acceptable than man-made inerts (e.g. plastic)

The above table is derived from information developed for the US Composting Council's Consumer Compost Use Program

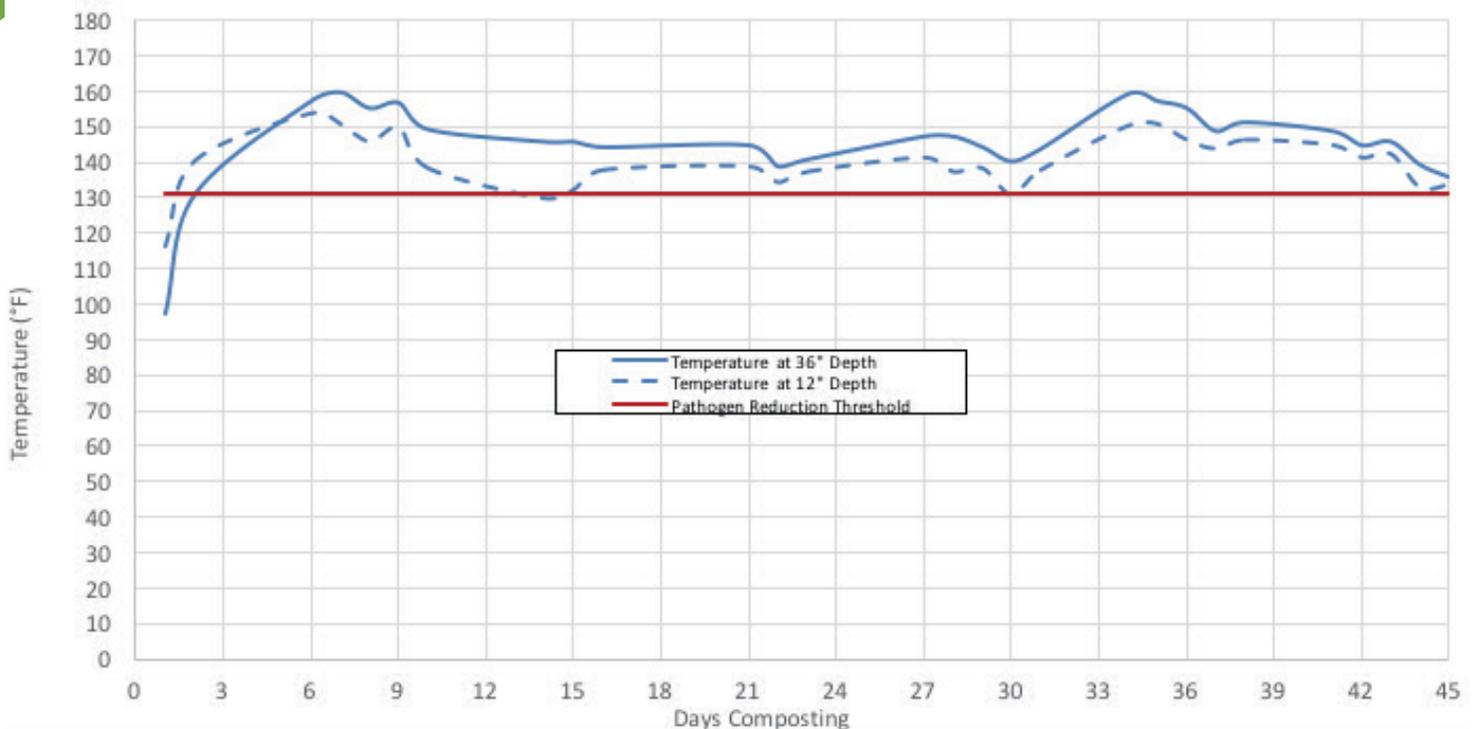
Note: If you need more information, please contact ECUA.

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Sample Windrow Temperature Monitoring Log

Temperatures are monitored daily at ECUA's biosolids composting facility. The windrows temperature is taken at a 12" depth (surface just below the capping layer) and a 36" depth (interior of the windrow) to ensure that all material in the windrow reaches proper temperatures for pathogens to be destroyed.

This means that any product you receive will be considered safe to use. State regulations require that the surface of the windrow is above 131°F for at least 3 days and the interior is above 131°F for at least 15 days. As you can see in the graph, ECUA's compost well exceeds these requirements.



Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Biosolids Compost Use: General Information, Contacts, and What You Should Know

Biosolids Compost End-User Information and Contacts

Under Florida Department of Environmental Protection (FDEP) Classification for Biosolids Compost, Class AA can be distributed and marketed as a potting soil or soil amendment under Chapter 62-640, F.A.C. Please contact the FDEP Organics Recycling contact if you need more information.

Maurice Barker
Biosolids Coordinator
FL Dept. of Environmental Protection
Tallahassee, FL, 850-245-8614
maurice.barker@dep.state.fl.us

The US Environmental Protection Agency (EPA) allows biosolids compost that meets their Class A, Exceptional Quality standards to be used anywhere and on any crop, with no record keeping required. Some end-users may have specifications that do not allow the use of biosolids compost, so distributors and wholesalers should do further research for their market channels. Please contact the EPA Region 4 for further information.

Robin Billings
Recycling/Composting Information
US EPA, Region 4
Billings.Robin@epa.gov
Office: (404) 562-8515

In Florida, it is prohibited to use biosolids compost on commercial tomato crops. For more information, please visit the following sites:

- Florida Department of Agriculture and Consumer Services (FDACS), Tomato Best Practices Manual: http://fvreports.freshfromflorida.com/5G_TomBPM.pdf
- Florida Administrative Code, Chapter 5G-6 (Tomato Inspection): <https://www.flrules.org/gateway/ChapterHome.asp?Chapter=5G-6>
- FDACS Food Safety Audit – Tomato Good Agriculture Practices: <http://forms.freshfromflorida.com/07081.pdf>

For more information about this rule, please contact FDACS at: Plant Industry Helpline: 1-888-397-1517 or 1-888-397-1517 or go to their website and have a Free Chat with your questions. <http://www.freshfromflorida.com/Contact/>

Additionally, use of biosolids (sewage sludge) compost is prohibited under the USDA's National Organic Standards: <https://www.ams.usda.gov/grades-standards/organic-standards>

Use of Compost on Florida Soils

Florida soils tend to have low organic matter. Common Florida soils include the following types:

- Spodosols:** high sand, hardpan, low organic matter, acidic
- Entisols:** high sand or clay, undeveloped, low organic matter
- Alfisols:** high clay, hardpan, low organic matter, acidic or basic
- Ultisols:** high clay, low organic matter, acidic

The application of compost adds organic matter to these soils and improves their structure and quality to help meet optimal soil characteristics.

Optimal Soil Characteristics	Parameter	Optimal Range
	Organic Matter	4% - 8%
	pH	6.5 - 7.5
	Sand-silt-clay content	40-40-20
	Pore Space	10%

This table of optimal soil characteristics is taken from the FDEP Compost Operator Training Course developed by Kessler Consulting, Inc. through the Florida Organics Recycling Center for Excellence (FORCE).

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Frequently Asked Questions About Compost and Biosolids Compost

What are biosolids?

Biosolids are the result of the biological, chemical, and mechanical treatment of wastewater. A common misconception is that biosolids are a more pleasant pseudonym for human fecal matter (i.e. poop), rather they are mostly bacterial cells that are grown to treat the wastewater. During the treatment process, these bacteria consume the nutrients and organic matter in the wastewater. When the bacteria are separated from the treated water, all these nutrients and organic matter are removed with them, and eventually make it into the compost and helps grow future plants.

How is compost made?

Composting is a biological process through which macro and microorganisms decompose organic matter into an organic soil-like substance, called compost. There are a range of techniques and technologies for composting, from a simple compost pile in your backyard to large-scale commercial operations. Commercially there are three common ways to compost: turned windrow, aerated static pile, and in-vessel.

A turned windrow is essentially an elongated compost pile or windrow that is frequently turned to provide oxygen, distribute moisture, and ensure adequate decomposition of all material. An aerated static pile is not turned but air is forced through the pile, usually with fans or blowers to provide oxygen throughout the pile. In-vessel composting involves a large container or other enclosure in which the compost is mixed and oxygen is provided.

ECUA is using a process called modified static aerobic pile (MSAP), which is a hybrid between turned windrow and aerated static pile. Like the turned windrow, material is placed in a windrow, but an inoculant, which contains beneficial bacteria and fungus, is placed on top of the mixed material and on top of that is a capping layer of ground yard waste that acts as a blanket to insulate the compost and reduce odors. The inoculant grows rapidly underneath the capping layer and in doing so, pulls oxygen into the windrow (much like a aerated static pile) allowing all material to properly decompose. During the entire process, the pile is turned twice (as opposed

to much more frequent turning with turned windrow). This saves money and further reduces odor, which can be released during the turning process.

Are biosolids all that ECUA is composting?

In order to properly compost biosolids, which are high in nitrogen, they must be mixed with a material high in carbon. An excellent source of high carbon material is yard waste the ECUA collects from the community. ECUA grinds this yard waste into mulch, then mixes it with the biosolids prior to composting. The blend has proven to be ideal for the compost process and helps to rapidly decompose both materials. By composting these two materials, ECUA is keeping both out of the landfill.

Since the yard waste used in the compost is what you put out on the curb, it is critical that yard waste is not bagged in plastic bags, rather use brown paper bags, which are compostable, or your own trash can. Remember “leaf the plastic behind, brown is the new green.”

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Frequently Asked Questions

How can compost be used?

Compost can be used anywhere nutrients and organic matter can be used, these include:

Residential uses

- Flower, fruit and vegetable garden beds (except tomatoes for biosolids compost)
- New or established trees
- New or established lawns
- Container plants

Commercial uses

- Sod farms
- Landscape management
- Nurseries
- Agriculture
- Silviculture
- Golf courses
- Turf establishment for new construction
- Roadside plantings and highway beautification
- Land reclamation, restoration, and remediation
- Stormwater management with vegetated infiltration zones (i.e. rain gardens)
- Erosion control (e.g. compost blankets or compost filter sock)

What are the benefits of using compost?

Compost is a soil amendment that has a myriad of benefits for improving soil, these include:

- Provides nutrients and organic matter to soil
- Improves nutrient retention capacity
- Improves moisture retention and water utilization
- Improves soil structure

- Balances and stabilizes pH
- Provides beneficial microorganisms
- Reduces plant diseases
- Binds and/or degrades contaminants

How do I apply compost?

Compost is a soil amendment and should be mixed with soil or another planting medium when direct planting for beds, containers, or new plantings. Alternatively compost can be applied over existing plants either as a top dressing or side dressing. Specific instructions for application rates are based on the compost analysis results. These instructions will be included with the compost you buy.

What nutrients are in the compost?

Biosolids compost contains the “big three” nutrients: nitrogen, phosphorous, and potassium. The compost also contains a variety of micronutrients including calcium, magnesium, copper, iron, manganese, zinc, boron, and sulfate. The actual quantity of these nutrients varies. Full results are available with the compost analysis test results.

Is biosolids compost safe?

Yes! The composting process “cooks” the biosolids at temperatures often up to 150°F, which effectively kills any harmful bacteria or microorganisms (pathogens). State and federal regulations set strict standards

for pathogens and harmful heavy metals in Class AA biosolids compost. The compost produced by ECUA is frequently tested and harmful bacteria and heavy metals are well below maximum concentrations required by law. Additionally, ECUA’s compost has been certified by the US Composting Council’s (USCC) Seal of Testing Assurance (STA) to ensure that the compost is regularly tested in accordance with industry approved methods at certified laboratories and that the results are made available to the public.

What is the USCC STA program?

From USCC’s website: “The US Composting Council’s Seal of Testing Assurance (STA) Program is a compost testing, labeling and information disclosure program designed to give you the information you need to get the maximum benefit from the use of compost.” In this program, which ECUA is enrolled, compost is regularly tested for a number of parameters important to compost usage. These include: macro and micro nutrients, pathogens, heavy metals, soluble salts, moisture content, organic matter content, maturity, stability, and particle size. All testing is required to be conducted at an STA-certified lab.

Does the compost smell?

Come see for yourself! The finished compost will have a pleasant earth smell similar to soil or mulch.