

UF/IFAS Sumter County Extension Service
Susan Kelly, County Extension Director
352-793-2728
FORCE Project Quarterly Report
January 1-March 31, 2006



Section I – Project Name & Overview

Project Name: Sumter County Extension Service Composting Unit Field Trial and Demonstration Project

Project Description:

The Sumter County Extension Service proposes to conduct a series of field trials at the Sumter County Youth Center on a pre-selected small-scale composting vessel. Compostable organic materials will be collected by local volunteer groups and will serve as the feedstock for the compost unit field test. Testing will take place to determine the effectiveness of a composting unit known as the Earth Tub composting vessel. The Earth Tub composting vessel was selected for this study by the Florida Organics Recycling Center for Excellence (FORCE). Testing and data collection will include; type and quantity of feedstock; elapsed time to compost various feedstock; weekly temperature readings and compost analysis by a private laboratory.

To create awareness of the program and to provide educational opportunities, a composting informational kiosk will be created to showcase composting techniques and the results of the Earth Tub demonstration. Children and adults will learn about composting while visiting the Sumter County Youth Center and educational publications will be available to for home, school, office or business application. A promotional publication will be created to promote composting as well as create interest in the FORCE sponsored composting unit field trial.

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- e. Project Duration: Summer 2005 – March 20, 2006
- f. Partner Organizations
 - a. In-Kind Contributions:
 - i. Sumter County Youth Center - electricity, water and site
 - ii. Master Gardener Volunteer- assistance and feedstock collection assistance
 - iii. UF Extension- project management
 - b. Matching Funds
- g. Project Deliverables:
 - Quarterly status reports of project progress
 - Final report on Earth Tub evaluations and comparisons with selected feedstocks including private laboratory analysis.
 - Copy of all educational and promotional materials developed during the duration of the project

Section II – Project Progress With Time Line

- September 27, 2005 - Written approval of grant funds from FORCE Program to UF/IFAS Sumter County Extension Service.
- October 20, 2005 - 25' x 25' concrete slab is poured at demonstration site.
- November, 2005 - Earth Tub composting vessel is delivered to the demonstration site by Sumter County Public Works.
- November 16, 2005 - 24' x 24' pole barn is back ordered with Bushnell Truss, Inc. Expected arrival date is January, 2006.
- November 29-30 - Trench is dug for 220V electrical wiring from Youth Center to demonstration site.
- December, 2005 - Copper wire is installed from the Youth Center to the demonstration site; organic feedstock collecting started by Master Gardener volunteers and; informational kiosk design is started by Master Gardener volunteers.
- December 15, 2005 - Thirty-two children from the Youth Center are taught about composting and also about the functions of the Earth Tub composting vessel.

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- December, 2005 - A swiveling top to guide the power cord for the auger is made to minimize the power cord for the auger getting wrapped around the Earth Tub.

Background: This problem was identified in the Earth Tub Trouble Shooting literature. The Earth Tub must be mixed ~3x/week with the auger running to mix the food scraps with the bulking agents. This is done by starting the auger and then rotating the tub for two complete rotations (one clockwise and the other counterclockwise). During the rotation, the cord often gets wrapped around the side of the Earth Tub and restricts further movement.

- From January 10, through January 27, 2006, horse manure was added to the Earth Tub composting vessel; a total of 1910 pounds of horse manure was added to the Earth Tub. The horse manure is very fresh and contains a great amount of saw dust. Approximately 100 pounds of oak leaves were added to the Earth Tub in an effort to achieve the 30:1, C:N ratio. In retrospect, the oak leaves were probably not needed. The Earth Tub was mixed approximately every third day and temperatures were taken before each mixing.
- Due to a crack in the threaded fitting in the Tub port 00 and difficulty fixing or replacing this threaded fitting, the aeration system (including the bio-filter) was not used in the first batch of compost. Based on the temperatures observed while composting as well as the compost analysis (see Table 2 below), the lack of aeration did not hinder the composting process. If the threaded fitting can be replaced, the aeration system will be used in future batches of compost.
- On January 20, 2006, an Earth Tub Compost System Operations and Maintenance Manual (32 pgs.) was obtained from Stacie Stokes.
- During the week of February 6, 2006, a 25' x 25' pole barn kit from Bushnell Truss was installed over the concrete slab and the Earth Tub.
- On February 10, 2006, while rotating the Earth Tub, the aluminum roller channel, located under the auger motor, broke into pieces. This cannot be replaced nor repaired at this time.
- On February 13, 2006, met with Stacie Stokes at the Sumter County Youth Center. During this meeting we decided that some moisture should be added to the contents of the Earth Tub. On February 16, approximately 100 gallons of water was sprayed onto the contents of the Earth Tub.
- On February 22, 2006, 23 new Sumter County Master Gardener trainees received 1.5 hours of training on composting including a tour of the Earth Tub project at the Sumter County Youth Center.

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- On March 14, 2006, a sample of compost from the Earth Tub was mailed overnight to Woods End Research Laboratory. Results of this analysis are found in Table 2.
- Table 1 - The date and weight of ingredients added to the Earth Tub and the temperature of the compost.

Date	Weight of Horse Manure And Oak Leaves (lbs)	Temperature of Compost (F°)
01/10/06	Manure 125	71°
01/13/06	Manure 197	86°
01/20/06	Manure 598	111°
01/23/06	Manure 576	114°
01/27/06	Manure 414	119°
01/27/06	Oak leaves ~100	120°
02/01/06		122°
02/04/06		121°
02/07/06		124°
02/10/06		125°
02/13/06		124°
02/16/06		125°
02/19/06		129°
02/22/06		132°
02/25/06		134°
02/28/06		133°
03/02/06		127°
03/05/06		123°
03/08/06		118°
03/10/06		113°
03/13/06		106°
03/15/06		103°
03/18/06		99°
03/21/06		96°
03/24/06		90°
03/27/06		88°
03/30/06		84°

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- Table 2 - Analysis of Horse Manure Compost in Earth Tub Composting Vessel (by Woods End Analytical Lab)

Variable Measured	Unit	Dry basis	As is basis	Notations
Density	lbs/cubic ft	-	42	1129 lbs/yd ³
Solids	%	100	55.1	1102 lbs/ton
Moisture	%	0	44.9	108 gals/ton
Est. water holding capacity	%	96	49	117 gals/ton
Inert & Oversize matter	%	~	0.6	12 lbs/ton
pH	-logH ⁺	~	7.41	Med-Ideal
Free Carbonates	Rating	~	1	None
Organic matter	%	25.8	14.2	284 lbs/ton
Conductivity	mmhos-cm ⁻¹	~	2.4	Med-Low
Carbon:Nitrogen Ratio	w:w	22.5	22.5	Med-High
Solvita Carbon Dioxide Rate		~	7.00	Low
Solvita Ammonium Rate		~	5.00	Absent
Maturity Index		~	7	Mature
Total Nitrogen	%	0.620	0.342	6.8 lbs/ton

- In April 2006, the compost will be removed from the Earth Tub and weighed to provide total produced compost, by total weight (in pounds).
- A second batch of compost will be added to the Earth Tub later in April 2006, with the ingredients to be determined by local availability.
- The broken aluminum roller channel under the auger motor is a sign that the Earth Tub cannot be turned by a single person despite a manufacturer picture depicting a single person mixing the Earth Tub. After the breakage of the aluminum roller channel on February 10, all rotating of the Earth Tub has been done by a minimum of 2 people.