

QUARTERLY PROGRESS REPORT

March 1, 2011 – May 31, 2011

PROJECT TITLE: Diverting Food Waste from Landfills

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COMPLETION DATE: November 30, 2011

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PROJECT WEBSITE ADDRESS: <http://biogas.ifas.ufl.edu/foodwaste/>

OBJECTIVES:

1. Continue lab-scale experiments to optimize food waste digestion.
2. Conduct food waste audits at local schools.
3. Demonstrate anaerobic digestion at local schools.

WORK ACCOMPLISHED DURING THIS REPORTING PERIOD:

Objective 1:

Experiments for the optimization of food waste digestion were completed in previous quarters. The results were analyzed this quarter. These experiments found that practical mechanical pretreatment (i.e. meat grinder or in-sink food disposer) greatly enhanced the solubilization rate of food waste. A higher solubilization rate enables faster assimilation by the anaerobic microorganisms, which can increase the overall methane production rate. These experiments indicated that the pretreatment of food waste should be partnered with a high-rate anaerobic digester, which has a high population of methanogenic microorganisms, in order to increase the methane production rate and optimize the anaerobic digestion of food waste. A high-rate digester, such as a fixed-film reactor, also allows for a smaller digester, which increases the feasibility of food waste digestion particularly for small-scale digesters at schools, restaurants, or grocery stores.

Objective 2:

Data analysis of the food waste audits previously conducted at three local schools is ongoing.

Objective 3:

Experimentation with the portable, food waste anaerobic digester continues and the process of optimizing the performance of the digester is ongoing. The portable digester is being used to demonstrate anaerobic digestion of food waste to students and staff at local schools.

As part of a guided tour of our laboratory, the digester was demonstrated to 30 high school students from the Academy of Environmental Science, Crystal River, FL (May 11, 2011).

INFORMATION DISSEMINATION ACTIVITIES:

- March 2, 2011
A group of graduate students in Agricultural and Biological Engineering visited the laboratory. These students were developing a biofuels business plan and were interested in our research in bioenergy and sustainable technology. Their visit included discussion of the importance of anaerobic digestion of food waste and its role as part of a sustainable biofuel industry.
- March 22 and 24, 2011
We hosted laboratory tours for two classes in Environmental Sciences and Humanities Lab (EES 3000L). Each class consisted of 15 undergraduate students. The tour included demonstrations of food waste digestion in action and discussion of how food waste pertains to bioenergy and sustainability.
- April 1, 2011
We delivered a lecture to 25 undergraduate students in the Agriculture and Environmental Quality class (ALS 3133). The lecture consisted of discussion of food waste digestion, its benefits, and its role in the larger bioenergy and sustainability picture.
- May 11, 2011
A group of 30 high school students from the Academy of Environmental Science in Crystal River, Citrus County, toured the laboratory. The tour included demonstration and discussion of food waste digestion and its importance to sustainability. A cooking demonstration using biogas from the portable food waste digester was also given to the students.
- May 17, 2011
A representative from Six L's Packing company, a large tomato grower and packer in Immokalee, FL, met with us to discuss the potential of digesting tomato culls from their packing houses. Agriculture is a dominant industry in Florida and there is a large amount of culled produce and crop waste generated in the state. Large packing houses and food processors represent an important opportunity for implementing food waste digestion in the state.