

REPORT FOR THE NCERA-101 MEETING, April 30-May 3, 2011

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**Department of Plant Biology and Pathology

1. New Facilities and Equipment

None

2. Unique Plant Responses

None

3. Accomplishment Summary

We continue to work through operating and maintenance challenges associated with our landfill gas fired microturbine installation at the 1-acre NJ EcoComplex Research and Demonstration Greenhouse. A doctoral student is developing an operational decision support system to manage the electricity generated: use onsite (supplemental lighting for greenhouse tomatoes), export to the utility grid (additional income), or a combination of the two.

4. Impact Statement

Nationwide, Extension personnel and commercial greenhouse growers have been exposed to research and outreach efforts through presentations, publications and evaluation tools. It is estimated that this information has led to proper greenhouse designs and updated operational strategies that saved an average sized (1-acre) greenhouse business a total of \$20,000 in operating and maintenance costs annually. Greenhouse energy conservation presentations and written materials have been prepared and delivered to local, regional, and national audiences. Growers who implemented the information resulting from our research and outreach materials have been able to realize energy savings between 5 and 30%.

5. Published Written Works

Zinati, G.M., J. Dighton, and A.J. Both. 2011. Fertilizer, irrigation and natural ericaceous root and soil inoculum (NERS): Effects on container-grown ericaceous nursery crop biomass, tissue nutrient concentration, and leachate nutrient quality. HortScience (accepted for publication).

Okushima, L., D.R. Mears, S. Sase, M. Ishii, and H. Moriyama (2011). Thermal condition in a compact sunroom for fresh vegetables production. International Journal of Sustainable Energy 30(5):277-288.

Manning, T., A.J. Both, and J. Rabin. 2010. Understanding on-farm utility costs and billing. Rutgers Cooperative Extension Fact Sheet FS1128.

6. Scientific and Outreach Oral Presentations

Both, A.J. 2011. High tunnel construction. NOFA-NJ farmBASE 2011.

Both, A.J. 2011. Engineering green solutions. Rutgers University 4-H Climate Change Teen Summit.

Both, A.J. 2011. Alternative energy case study. NJ Farm Bureau and NJAES.

7. Other Relevant Accomplishments and Activities

International Committee for Controlled Environment Guidelines: A.J. Both, Chair (Guidelines for Monitoring and Reporting Environmental Parameters for Experiments in Greenhouses)

Associate editor Transactions of the ASABE/Applied Engineering in Agriculture: A.J. Both (since 2003)

Sabbatical leave: A.J. Both (August 2011-July 2012; Wageningen University)