

**REPORT FOR THE NCERA-101 MEETING, March 8-12, 2008**

Faculty: A.J. Both, David Mears

Staff: Tom Manning, Eugene Reiss

Bioresource Engineering, Department of Plant Biology and Pathology

<http://aesop.rutgers.edu/~horteng>

[both@aesop.rutgers.edu](mailto:both@aesop.rutgers.edu); [mears@aesop.rutgers.edu](mailto:mears@aesop.rutgers.edu)

[manning@aesop.rutgers.edu](mailto:manning@aesop.rutgers.edu); [reiss@aesop.rutgers.edu](mailto:reiss@aesop.rutgers.edu)

1. New Facilities and Equipment

A new landfill gas fired 250 kW microturbine is being installed at the EcoComplex greenhouse facility.

2. Unique Plant Responses

None

3. Accomplishment Summaries

A greenhouse environment control simulation tool (spreadsheet) was further developed and refined to allow for the evaluation of control strategies including heat pumps and energy storage facilities.

A bioenergy assessment report for the state of New Jersey was completed. The report will be used to identify future research opportunities, as well as provide valuable information for the state's bioenergy master plan that is currently under development.

4. Impact Statements

Greenhouse energy conservation presentations and written materials have been prepared and delivered to local, regional, national and international audiences. Growers who implemented the information resulting from our research and outreach materials have been able to (conservatively) realize energy savings between 5 and 30%.

5. Published Written Works

Both, A.J. and E. Reiss. 2007. Consider design with a new floor heating system. Greenhouse Management and Production (GMPro). December issue. pp. 35-37.

Both, A.J. 2007. Greenhouse cooling basics. American Nurseryman. September 15 issue. pp. 20-24.

Both, A.J., E. Reiss, J.F. Sudal, K.E. Holmstrom, C.A. Wyenandt, W.L. Kline, and S.A. Garrison.

2007. Evaluation of a manual energy curtain for tomato production in high tunnels. HortTechnology 17(4):467-472.

Both, A.J., D.R. Mears, T.O. Manning, E. Reiss, P.P. Ling. 2007. Evaluating energy savings strategies using heat pumps and energy storage for greenhouses. ASABE Paper No. 07-4011. ASABE, 2950 Niles Road, St. Joseph, MI 49085-9659, USA. 16 pp.

Both, A.J. 2007. Maintain temperatures with evaporative cooling. Greenhouse Management and Production (GMPro). April issue. pp. 39-42.

Both, A.J. 2007. Greenhouse ventilation. (Abstract) Proceedings of the Annual NJ Vegetable Growers' Association Meeting. January 16-18. Atlantic City, NJ. pp. 76-79.

Brennan, M., D. Specca, B. Schilling, D. Tulloch, S. Paul, K. Sullivan, Z. Helsel, P. Hayes, J. Melillo, B. Simkins, C. Phillipuk, A.J. Both, D. Fennell, S. Bonos, M. Westendorf, and R. Brekke. 2007.

Assessment of biomass energy potential in New Jersey. New Jersey Agricultural Experiment Station Publication No. 2007-1. Rutgers, the State University of New Jersey, New Brunswick, NJ.

- Fang, W., D. Mears, and A.J. Both. 2007. Story of air-inflated double-layer polyethylene greenhouse and its recent applications in Taiwan. International Seminar on Agricultural Structures and Agricultural Engineering (IS-ASAE). National Taiwan University, Taipei, Taiwan, R.O.C. December 8th-9th, 2007. 6 pp.
- Mears, D.R. 2007. Techniques on energy conservation and environment control in greenhouses. NIRE, Miyagi Prefecture, Japan. January 25, 2007 (3 papers each in English and Japanese).
- Rabin, J. and A.J. Both. 2007. NJ agricultural at a glance - Floriculture. In Sustaining Farming on the Urban Fringe. NJAES. December Issue.
- Reiss, E., D.R. Mears, T.O. Manning, G.J. Wulster, and A.J. Both. 2007. Numerical modeling of greenhouse floor heating. Transactions of the ASABE 50(1):275-284.
- Wyenandt, A., W.L. Kline, A.J. Both, and D. Ward. 2007. Effects of soilless bag production and soil fumigation on the development of white mold (*Sclerotinia*) in tomato high tunnel production. (Abstract) Northeast Region of ASHS Annual Meeting, January 4-6, University of Maryland, College Park, MD.
- Zinati, G.M., J. Dighton, and A.J. Both. 2007. Fertilizer, irrigation, and mycorrhizal effects on container-grown nursery crop biomass accumulation and leachate nutrient content. (Abstract) HortScience 42(4):862.
6. Scientific and Outreach Oral Presentations
- Both, A.J. 2008. Greenhouse energy conservation. South Jersey Commercial Greenhouse Growers Conference. Clayton, NJ. February 19, 2008.
- Both, A.J. 2007. Optimizing plant growth through environmental control. Agricultural Structure and Environment Seminar No. 34. Hiroshima Prefecture Agricultural Research Center. Organized by the National Institute for Rural Engineering, Tsukuba, Japan. December 13, 2007.
- Both, A.J. 2007. Technologies for greenhouse energy conservation. 25th Anniversary Perennial Plant Symposium organized by the Perennial Plant Association, Columbus, OH. August 9, 2007.
- Both, A.J. 2007. Surviving the energy crisis part 3: Conservation in the greenhouse. OFA Short Course, Columbus, OH. July 14, 2007.
- Mears, D.R.. 2007. Greenhouse energy conservations and alternatives. Agricultural Structure and Environment Seminar No. 34. Hiroshima Prefecture Agricultural Research Center. Organized by the National Institute for Rural Engineering, Tsukuba, Japan. December 13, 2007.
7. Other Relevant Accomplishments and Activities
- International Committee for Controlled Environment Guidelines: A.J. Both, Chair
- NE-1017 Developing and Integrating Components for Commercial Greenhouse Production: A.J. Both, Chair (2007)