University of Kentucky - NCR-101 Station Report

New Facilities:

A complex of ten new greenhouses are in the process of being installed at the farm south of main campus. The complex has been in the planning stages for many years and ground was finally broken earlier this year.

Two sets of high tunnels from Haygrove are also being installed at the south farm. The tunnels are part of study on temperature control strategies. With the decline of tobacco production in the state, there is interest in alternative applications for the existing high tunnels used for tobacco seedling production.

Controlled environment chamber has been adapted from a government surplus mobile equipment trailer. The temperature and humidity within the chamber are being controlled with an air handling unit (9281-2220 1384P-03, Parameter Generation and Control, Black Mountain, NC). Currently, the chamber is being used is a low oxygen fumigation research.

Equipment / Sensors / Control Systems:

- FLIR S60 thermal imaging camera system.

Unique Plant Responses:

- Low oxygen (hypoxia) fumigation treatment has been demonstrated to be effective against greenhouse pests. We are evaluating the possibility of commercially using this treatment on in-coming and out-going greenhouse plant material to reduce infestations. Baseline tests show adverse effects on plants when zero oxygen conditions are held for 24-hours. The test system is currently being updated to allow the oxygen level to be varied in order to determine if there is an oxygen level low enough to be toxic to the insects and tolerable for the plants.

Committees / Panels:

USDA Small Business Innovative Research (SBIR) Review Panel Member
USDA NE-1017 Committee Member - Developing and Integrating Components for Commercial Greenhouse Production Systems
USDA NCR-101 Committee Member - Controlled Environment Technology and Use
ASAE Structures and Environment Division - Environment of Plant Structures (SE-303)
ASAE Structures and Environment Division – Nursery and Greenhouse System Engineering (SE-406)

Visiting Scientists:

No report.

Recent Publications:

Kim, H-H, R.M. Wheeler, J.C. sager, and J.H. Norikane. 2005. Photosynthesis of lettuce exposed to different short term light qualities. *Environment Control in Biology* (in press).

Norikane, J.H., J.C. Sager, R.M. Wheeler, G.W. Stutte, and H.-H. Kim. 2005. Characterization of Nutrient Solution Changes during Flow through Media. 35nd International Conference on Environmental Systems (ICES). Rome, Italy. 11-14 July 2005. (accepted).

Norikane, J.H., S.B. Jones, S.L. Steinberg, H.G. Levine, and D. Or. 2005. Porous media matric potential and water content measurements during parabolic flight. *Habitation* 10(2):117-126.
Norikane, J.H., J.J. Prenger, D.T. Rouzan and H.G. Levine. 2005. A Comparison of Soil Moisture Sensors for Space Flight. *Applied Engineering in Agriculture*. (in press).
Prenger, J.J., S.L. Steinberg, D. Haddock, J.H. Norikane, and H.G. Levine. 2004. Accuracy of a point source thermal soil moisture sensor for space flight nutrient delivery systems. *SAE Tech. Paper* 2004-01-2456.

Website:
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