Web site: http://aesop.rutgers.edu/~horteng

CCEA Newsletter

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CCEA is a research organization dedicated to the improvement and vitality of the Controlled Environment Agriculture Industry. CCEA is funded by Industrial and Grower Partners who contribute a yearly partnership fee. Satellite partnership is also available to growers. Information about **CCEA** is available from:

Dr. A.J. Both, Director
Bioresource Engineering, Dept. of Plant Biology and Pathology,
Rutgers the State University of NJ,
20 Ag Extension Way,
New Brunswick, NJ 08901
732 932 9534 (Voice)
732 932 7931 (Fax)
both@aesop.rutgers.edu

Vision Statement
CCEA, The Center for Controlled Environment Agriculture of NJAES at Rutgers University, a partnership among growers, industry, and researchers, will devote itself to research and transferring information required for an economically viable and environmentally aware controlled environment agriculture industry. We will particularly strive to identify future trends, critical issues, appropriate emerging technologies and provide leadership for opportunities which challenge world-wide controlled environment agriculture in the 21st century.

What Energy Crisis?

Remember the quickly increasing energy prices last heating season? It was not unusual for growers to pay two or three times as much for heating fuel. Some growers paid even more than that. There was a renewed interest in energy conservations and we received many questions about the use of alternative fuel sources (especially wood). Despite the increasing tensions in the Middle East, the terrorist attacks on September 11, and the military actions in Afghanistan, this heating season fuel prices have remained at levels we were accustomed to before last year's price increases. So, does that mean we don't have to worry anymore about energy prices, fuel consumption, and conservation measures? I don't agree. True, energy conservation is less of an incentive when fuel prices are low, but every dollar saved can be used for something else. And who knows what will happen with fuel prices in the future? Energy conservation is a mind set that growers and their employees have to be willing to adopt. Once everyone involved is aware of the financial benefits, as well as to the benefits for society at large, it becomes much easier to stay focused on energy conservation. Growers can use incentives to keep their employees motivated to conserve energy. Consider it a continuous challenge that may pay off by the time new increases in energy prices occur. It seems a sure bet that this will happen. If only we knew when…
A.J. Both

MEETING AGENDA

NE-164 Meeting

The 2002 annual NE-164 (Committee on Decision Support for Design and Control of Plant Growth Systems) meeting will take place on March 8-9 in Tucson, AZ. The meeting will be hosted by Professor Gene Giacomelli, Director of the Controlled Environment Agriculture Center. For more information about this meeting, please check the CEAC web site at: http://ag.arizona.edu/ceac/research/news/usda.htm.

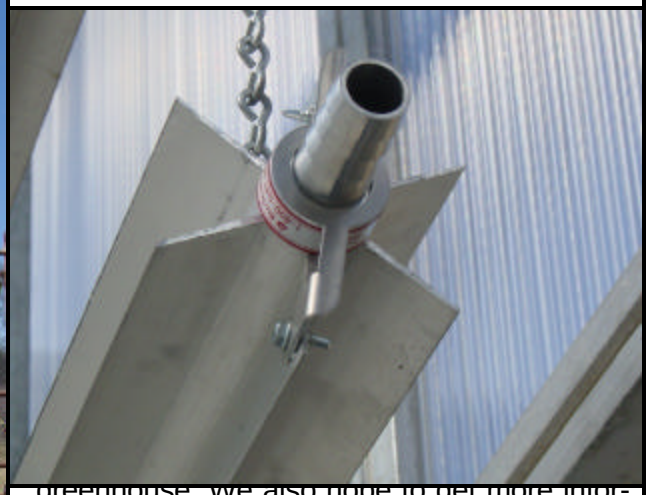
NCR-101 Meeting

The 2002 annual NCR-101 (Committee on Controlled Environment Technology and Use) meeting will take place from April 6-9 in Durham, NC. The meeting is co-hosted by the National Phytotron at Duke University and the North Carolina State University Phytrotron. For more information about this meeting, please check the NCR-101 web site at: http://www.biology.duke.edu/ncr101.

Heating System in the Open-Roof Greenhouse

Eugene Reiss (Program Associate) is continuing to make progress with the installation of the gas-fired, hot-water heating system in the open-roof greenhouse. As you can see from the pictures on this page, the boiler was placed in the northeast corner of the greenhouse. The chimney stack passes through the north wall and the top of the stack reaches two feet above the greenhouse ridge to make sure the exhaust gases are released far enough away from any possible re-entry point. The heating system is designed with three zones: two separate floor zones for each of the two identical growing areas, and a combined perimeter & overhead zone. The floor zones consist of polypropylene heating pipes embedded in the concrete floor. For the perimeter & overhead zone, so-called star fin pipes are used. These pipes are easy to install (require push-type instead of threaded fittings) and their large surface area make for efficient radiators. Once in operation, the floor zone will provide up to 30% of the heating requirement, while the perimeter & overhead zone provides the rest. We have installed

temperature sensors and flow meters in the various heating loops in an attempt to measure the amount of heat (Btu/h) provided to each loop. This data should help us determine the contribution of each of the heating loops to the overall energy requirement of the



greenhouse. We also hope to get more information on how best to manage the heating system, especially the operation of the floor loops (e.g., how long before the end of the day to turn them on in order to maintain proper root zone temperatures).

Low Tech Controlled Environments: High Tunnels

High tunnels are simple (greenhouse) structures used to extend the growing season (both at the beginning and the end of the season). The word high indicates that they are tall enough for a person to walk in, although some designs don't leave much room near the sidewalls due to the curvature of the roof bows. Frequently, high tunnels are freestanding hoop houses outfitted with a single layer of greenhouse film (e.g., 6 mil polyethylene). No heating system is available except for a standby emergency heater for the coldest nights. The plants are often grown in raised beds, covered with a plastic mulch and irrigated with drip irrigation installed underneath the mulch. Therefore, a source of irrigation water is required at the site. The plastic mulch limits the growth of weeds, helps heat the soil by trapping solar radiation, and reflects some amount of light back into the crop canopy. Early in the growing season, growers track the soil temperature, and soon as it reaches an acceptable level, the crop is planted. The end walls of high tunnels are usually made from plywood. Ventilation is provided by opening the doors in the end walls and/or by installing (manual) roll-up sides. During the summer months, when outside conditions are acceptable for crop production, the greenhouse film is sometimes completely removed. However, for some crops, the remaining greenhouse film can serve as an effective rain shelter and protect against fruit damage.

For several years, researchers at the Pennsylvania State University have conducted research on high tunnels. They provide information about their research findings on the following web site: http://plasticulture.cas.psu.edu.

Last year, Steve Garrison (Rutgers University Extension Specialist) and Wes Kline (Cumberland County Extension Agent) submitted a proposal to investigate opportunities to improve the fresh tomato market in NJ. The proposal was funded by the NJ Agricultural Experiment Station ($50,000 annually for up to five years), and one of the components of the proposal was to use high tunnels to study fresh tomato production. Therefore, we are working with Steve, Wes, and other researchers at Rutgers on developing economical fresh tomato production systems using high tunnels. We are planning to construct several experimental high tunnels at two or three sites at different locations throughout the state. Our contribution will be the monitoring and evaluation of environment conditions (both inside and outside the tunnels), as well as trying to develop management strategies that optimize the environment conditions for early fresh tomato production.

Do you have experience with high tunnels? Please feel free to share your comments with us!

Exterior view of a high tunnel for strawberries at Sheppard Farms Inc., Cedarville, NJ.

Tomato production in a high tunnel.

Joint UK CEUG and NCR-101 meeting

Last September, the annual NCR-101 (Committee on Controlled Environment Technology and Use) was hosted by the British Controlled Environment Users Group. The meeting was convened at the John h-nes Centre at the University of East Anglia in Norwich, UK. The theme of the meeting was "Controlled Environments in the New Millennium". The meeting was conducted in a conference format with invited lectures on an array of topics, followed by two days of tours. The presenters were asked to write a paper or provide a written summary of their presentations. The text of these papers will soon be available on the web. Check the NCR-101 web site (http://www.biology.duke.edu/ncr101) for updates. The following pictures taken during the tour show a tissue culture room with different spectrum fluorescent bulbs, a light cap wired for different lamps (INC and MH), a movable lamp rack for easy access to the bulbs outside the chamber, and a new growth room with benches and lamps along the wall and horizontal airflow through the perforated wall.