1. New Facilities Installed
None

2. Cooperative/Interdisciplinary Projects

Tomato Response to Short-term Temperature Perturbations
Two-week changes in air temperature imposed after fruit-set were used to control single-truss tomato production scheduling and improve quality of vine-ripened fruit. Experiments were conducted with hydroponically grown tomato (Lycopersicon esculentum Mill., cv. Laura). Air temperature was altered from control values of 23/18°C for a two-week period starting 10 days post fruit-set. Plants were returned to control temperature and fruits were harvested from the cluster at three ripening stages, breaker (25% of the fruit skin acquired a red tint), breaker plus three days, and breaker plus six days. A ± 5°C (28/23°C and 18/13°C) temperature perturbation was used for two experiments and a ± 7°C (30/25°C and 16/11°C) was used in a third experiment. An increase in harvest window, reduction in days to harvest (between 5.5 and 7.2 days), and a reduction in fruit fresh weight at latter stages of vine-ripening was observed for high temperature treatments. Low temperature increased fruit fresh weight compared to the control, and the 16/11°C treatment delayed days to harvest by 2.7 days. Color indices, soluble solids, acidity, viscosity, and lycopene content at each vine-ripened stage were significantly different between temperature treatments. The temperature treatments altered the rate at which changes occurred in the external appearance of fruit (color) and internal characteristics. Results can be used for improving environmental control and management strategies for tomato growers.

Tomato Production in High Tunnels
The second year of tomato trials in the Rutgers University high tunnels was a mixed success. An early season trial with the commercial varieties SunBright and SunShine was started in late March at both the New Brunswick and Centerton locations. The trial at Centerton was completed at the end of August, but the trial in New Brunswick was lost due to a severe outbreak of white mold (caused by the fungus Sclerotinia sclerotiorum). As a result, the New Brunswick tunnels were available in early August for a fall experiment. This fall crop using the same commercial varieties was grown till the middle of November when unheated high tunnel production was no longer possible as a result of low outside temperatures. Preliminary conclusions are:
- High tunnels with mulched beds provide significantly higher soil and air temperatures
- Motorized roll-up sides reduce the labor requirement, but in our trials, had little effect on average daily temperatures, and significantly increased the construction cost
- Little difference in soil temperatures was observed under differently colored mulches
- Tunnel orientation did not significantly impact average light transmission (that turned out to be approximately 75%)
- The NJ growing season is too short for two consecutive full-term high tunnel tomato crops

3. Workshops/Symposia
The annual two-day workshop titled “Design of Greenhouse Systems” was organized in January 2004, 2005. The annual meeting of the regional project NE-1017 (Developing and Integrating Components for Commercial Greenhouse Production Systems) was organized at Rutgers in June in conjunction with the ASAE Historic Landmark Dedication of the first Air-Inflated Double-Layer Polyethylene Greenhouse (developed by Professor Emeritus William J. Roberts).

4. Committees and Sub-Committees Served
International Committee for Controlled Environment Guidelines: A.J. Both, Chair

5a. Recent Publications


5b. Publications Submitted


6. Internet Site

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

7. Other

Since the 2004 annual meeting, where the International Committee for Controlled Environment Guidelines presented the brochure titled “Minimum Guidelines for Measuring and Reporting Environmental Parameters for Experiments on Plants in Growth Rooms and Chambers”, the committee developed and distributed the “Minimum Guidelines Poster” (12 by 17 inches; vertical format) summarizing the information contained in the brochure. In addition, a single large size poster (3 by 4 feet; vertical format) containing the same information was developed for use by the membership as a display at scientific meetings.