NCR-101COMMITTEE ON CONTROLLED ENVIRONMENT TECHNOLOGY AND USE
2005 STATION REPORT

Carole H. Saravitz
NCSU Phytotron
North Carolina State University
Raleigh, NC 27695
(919) 515-2778 FAX (919) 515-3635
email: carole@ncsu.edu
http://www.ncsu.edu/phytotron/

Proposed New Facilities & Phytotron Staff Projects

In late 2004, the Phytotron staff began modifying a B-chamber to allow production of frost. We are following the model presented by the Climate Laboratory (Robotham, Lloyd and Warrington. 1978. J Agri Engng Res. 23:301-311), however the use of cool mist seems to work better than steam with our chamber. We have been able to reliably produce frost (Fig. 1), however, we are still perfecting the technique.

The Plant Pathology department has proposed renovating a portion of the third floor of the Phytotron to install a BL3 facility. The facility would be located near the greenhouses in the area currently housing our Photoperiod Rooms. Plans are being drawn for the BL3 project, however additional funding must be ascertained before any construction can begin.

Fig. 1. Strawberry plant with frost.

Staff News

Many of you may remember Marty Winkler, who represented the NCSU Phytotron at the 2001 NCR101 Meeting at the John Innes Centre, Norwich, UK. Marty has been on military duty since April 2003 and he will be returning to his position at the Phytotron this April.

General Usage Information

Phytotron space use rental fees applicable to grant-supported research and to off-campus users is currently $1.47 per truck (unit) per day. The fee for an individual A-chamber is $36.00/day; for a B-chamber, $12.00/day; for a C-chamber, $4.50/day; and the $1.47/truck/day applies to space occupied in either the "standard" chambers or in the glasshouses. Fees include usage of plastic pots and substrate mixes, Phytotron nutrient solution and deionized water, and certain equipment such as balances, leaf area meter, drying oven, etc. Employment of part-time assistance for off-campus users can be arranged through the Director. Space use request forms are available on the web: www.ncsu.edu/phytotron.

---

[1] Usage calculations for A-chambers assume that the chambers contain a maximum of 24 units or 'trucks'. Optimal occupancy is set at 15 units, however, in order for there to be space for the investigator to work, for the staff to water plants and change lamps and wall fans, and to prevent overcrowding and shading of experimental material. B- and C-chambers usage is calculated on

the basis of maximum occupancy since their small sizes allow for reach-in care by investigators and staff.

[2] Standard A-chambers are set at 3 day/night temperature regimes of 26/22, 22/18, and 18/14 C. There are 2 chambers for each temperature regime, both programmed for a 9-hr high intensity light period coincident with the day temperature; one of the two chambers has a 15-hr dark period following the high intensity light period (simulating a short-day photoperiod) and the other chamber has a 3-hr low intensity light interruption provided by the incandescent lamps during the middle of the dark period (simulating a long-day photoperiod).

Table 1. CHAMBER USEAGE SUMMARY, 2004

Chamber*		***% Optimal***	***% Maximum***
A-chambers	(17 individual)	143	89
A-chambers	(5 standard)	76	48
A-chambers	(22)	128	80
B-chambers	(10)	62	62
C-chambers	(22)	80	80
Glasshouses	(5)	45	36
HID Walk-in	(2)	23	19
Tall Chamber	(1)	19	16

* Dimensions of Chambers are:

A = 8' x 12' x 7'h
B = 8' x 4' x 7'h
C = 4' x 3' x 4'h
H = 10' x 6' x 8'h
T = 16' x 12' x 7'-15'h

Utilization of all growth chambers during 2004:

Optimal Usage = 93
% Maximal Usage = 74

Table 2. **DEPARTMENT USAGE SUMMARY, 2004**

Department	***% total use-days***	***# Projects****
Biochemistry	0.8	1
Botany	20.8	13
Crop Science	36.6	16
Entomology	0.8	1
Forestry	0.2	1
Genetics	7.4	1
Horticultural Science	6.3	7
Phytotron	6.0	2
Plant Pathology	13.6	7
Soil Science	5.4	2
Teaching	2.2	2

*53 Studies Conducted in the Phytotron During 2004

Table 3. **CROP TYPE SUMMARY. % TOTAL USE-DAYS, 2004**

Crop	***% total use-days***
Corn	13.8
Demonstration	2.0
Ornamentals	3.2
Other	48.2
Peanut	10.0
Soybean	10.6
Teaching	0.7
Tobacco	4.6
Trees	0.9
Turfgrass	1.4
Vegetables	4.5