

NCR-101 COMMITTEE ON CONTROLLED ENVIRONMENT TECHNOLOGY AND USE  
2001 STATION REPORT

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### **Phytotron Staff Projects**

Phytotron Electronics and Mechanics staff have continued installation and testing of the new CO<sub>2</sub> monitoring and control system for all growth chambers. Small, non-dispersive, infra-red analyzers from Digital Control Systems (Portland, Oregon) are being adapted to interface with individual chamber controllers. This will provide independent carbon dioxide control on a chamber by chamber basis.

University facilities personnel are presently installing a new fire alarm system throughout the building, bringing it up to current safety codes. Earlier, additional emergency lighting was added to the building and fume hoods were given upgrades to increase air flow. New installations planned for the coming year include replacement of the current 20 year old reverse osmosis water purification system, and replacement of the original centrifugal chillers in the building.

Usage of the facility during 2000 is summarized by chamber type, departments, and crop type and included with this report. More detailed information on the 82 projects that were conducted in the Phytotron during 2000 can be found in the NCSU Annual Report 2000, 115 pages.

### **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 from the Director of the Phytotron, Box 7618, North Carolina State University, Raleigh, NC, 27695-7618, or on the web.

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<sup>1</sup> 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.

<sup>2</sup> Standard A-chambers are set at 4 day/night temperature regimes of 30/26, 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 USAGE SUMMARY, 2000**

<u>CHAMBER*</u>	<u>% OPTIMAL</u>	<u>% MAXIMUM</u>
A-chambers (14 individual)	136	85
A-chambers (8 standard)	102	64
All A-chambers (22)	124	77
B-chambers (11)	92	92
C-chambers (25)	89	89
Glasshouses (5)	58	47
HID Walk-in (2)	95	95
Tall Chamber (1)	50	50

\* 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 2000:

% Optimal Usage = 103

% Maximal Usage = 85

**Table 2. DEPARTMENTAL USAGE SUMMARY, 2000**

<u>DEPARTMENT</u>	<u>% TOTAL USE-DAYS</u>	<u># PROJECTS*</u>
Biochemistry	0.2	1
Biological Sciences	2.0	1
Botany	25.3	18
Crop Science	23.6	22
Entomology	0.01	1
Forestry	1.1	2
Genetics	9.5	8
Horticultural Science	2.3	13
Microbiology	0.7	1
Phytotron	9.6	3
Plant Pathology	9.8	5
Soil Science	6.9	2
Visiting Scientist	9.0	5

\* 82 Studies Conducted in the Phytotron During 2000

**Table 3. CROP TYPE SUMMARY, % TOTAL USE-DAYS, 2000**

<u>CROP</u>	<u>% TOTAL USE-DAYS</u>
Corn	4.3
Cotton	3.8
Demonstration	11.5
Fruit	1.4
Maintenance	0.1
Ornamentals	1.2
Other	31.2
Soybeans	13.0
Tobacco	26.6
Trees	1.0
Vegetables	5.9