

CHARTER
BIOL-VBI Plant Growth Facility
8/22//06 DRAFT

Mission:

Whereas the Department of Biological Sciences and the Virginia Bioinformatics Institute have limited access to plant growth facilities, a new facility was designed, funded, and constructed. The mission of the facility is to provide "state of the art" plant growth space to support and promote scholarship in plant systems by scientists at Virginia Tech. We strive to fully integrate this facility in the learning, discovery, and engagement activities of the department of Biological Sciences, the Virginia Bioinformatics Institute and other plant related departments and institutes at Virginia Tech.

The Facility:

The "Biological Sciences-VBI Plant Growth Facility" (VT-PGF) consists of 3240 square feet of plant growth space divided into five 432 square foot growth bays plus one smaller bay for propagation. The plant growth bays are located on Smithfield Plantation Road and are attached to the Ecosystems Simulation Laboratory building (ESL). Access to restrooms is available in the ESL and the ESL space can be used in the future for facility support. A state of the art computer regulated control system (Wadsworth) will regulate plant growth bay environmental conditions and provide data on the internet. Researchers will be able to obtain specific environmental data from sensors located in each growth bay and request changes of conditions as necessary.

Goals for The Facility:

The VT-PGF will support the research and broader significances of funded projects conducted by Virginia Tech faculty. Some specific goals are to:

- 1) Enhance the quality of existing research projects in the plant sciences by providing new, high quality plant growth space.
- 2) Attract new funding by relieving an existing constraint (the shortage of high quality plant growth space) on proposals written by Virginia Tech faculty.
- 3) Enhance the recruitment and retention of high-quality faculty.
- 4) Improve mentoring of graduate students by exposing them to a state of the art plant growth facility.
- 5) Enhance engagement at VT by providing a facility that will encourage faculty to strengthen the broader significances of their proposals through undergraduate research, K-12 discovery programs and community involvement in discovery at VT.

Management of the Facility.

Executive director:

An executive director of the VT-PGF will be appointed from the faculty of Biological Sciences by the Department Head of Biological Sciences and the Director of VBI. The appointment will be a two year renewable term. Term renewal will be based on the recommendation of the VT-PGF

committee with comments from faculty of VBI and the Department of Biological Sciences. The executive director will work with the VT-PGF committee to manage the facility as defined by the mission statement and facility goals. The responsibilities of the executive director include the following:

- 1) Supervise the staff position(s) that support the facility.
- 2) Act as a liason between the VT-PGF and other entities on campus that manage other facilities for growing plants.
- 3) Produce an annual report for the Department of Biological Sciences and VBI concerning all research, education, and outreach activities that occurred at the facility. The report will include a cost accounting for the facility and a recommendation for future user charges. Also, the report will include a discussion of all management issues that arose as well as a consideration of how the facility is integrated with University activities.
- 4) Chair the VT-PGF committee (described below).
- 5) Manage the cost recovery mechanism for the plant growth facility.

VT-PGF committee:

One faculty member from Biological Sciences and one from VBI will be appointed by their respective academic units in addition to the executive director. The director of VBI and the department head of Biological Sciences will serve as Ex Officio members of the committee. The committee will advise the executive director in the management of the facility including the activities listed below:

- 1) Making decisions on space allocated to individual faculty as defined in the charter.
- 2) Gathering and providing information for the Biological Sciences and VBI faculty on the availability of the facility for research, education, and outreach projects.
- 3) Establish the procedures needed for faculty to make use of the facility.
- 4) Discuss and establish policy, in association with the department head of Biological Sciences and the Director of VBI, as needed for the long term management of the facility.
- 5) Modify the charter as necessary based on policy decisions made in item 4.
- 6) Assist in the preparation of the annual report.

Facility supervisor:

The department of Biological Sciences will supply a classified staff position (currently occupied by Ms. Debbie Wiley-Vawter) to supervise the activities of the facility as described below.

Facility Use: The facility supervisor will provide information concerning facility use, expenses, maintenance issues, and predicted needs to the executive director for the annual

report. The facility supervisor will monitor the proper use of the facilities, and relay information about improper use to the executive director, department head of Biological Sciences, or Director of VBI who can enforce the rules.

Environmental Control: The facility supervisor will provide users with environmental control settings (Wadsworth system) for the growth bay as needed for the user research project.

Cultural Care: The facility supervisor will ensure an adequate watering regime that meets the soil moisture needs of each research project. This regime will vary according to each research projects needs, seasonal and environmental growing conditions, as well as the age of the plant. Users should monitor their plants regularly (weekly) for all other cultural needs. Although users are ultimately responsible for all other cultural needs of their plants (with the exception of watering and pest control), the facility supervisor is available for consultation on all matters of plant growth, plant health, pest issues and welcome user's questions.

Pest and Disease Prevention: The success of the protocols mentioned in the following sections relies upon the establishment of sanitary regimes such as inspection, sterilization and order of entry. All material coming from outside the facility needs to be inspected for pests or disease prior to placement in greenhouse room. All greenhouse rooms need to be sterilized before the start of experiments with cleaning solutions and heating to 45C for 3-5 days to kill eggs, larval and mature insects and/or pathogens. An order of entry will be instituted to minimize the spread of disease or infestation between zones.

Monitoring & Recording: The facility supervisor will examine all plants within the facility for pest or disease problems on a regular basis (weekly). A pest management program will be initiated for each individual experiment with pest or disease outbreaks. Treatments utilized, influencing factors and success of efforts will be recorded.

Treatment: Once pests have been detected and identified, the facility supervisor in consultation with the user will establish a pest control program for infected plants. Pests can be reduced through compatible physical and/or chemical means. The appropriate biological control can be introduced and cultural and environmental conditions can be modified (where possible) to favor the life cycle requirements of the plants and/or biological control agent (BCA). Pest and BCA populations are subsequently monitored and appropriate intervention taken.

Communication & Advisement: The facility supervisor has a responsibility to keep users informed on the status of any pest problems and to notify them of any pest control treatment that is being planned to minimize phytotoxicity and/or experimental disruption. Although users are ultimately responsible for the cultural needs of their plants (with the exception of watering and pest control), the facility supervisor is available for consultation on all matters of plant growth, plant health, pest issues and welcome user's questions.

Protocol for space allocation:

Space will be temporarily assigned to specific faculty members at VT for specific projects. Upon project completion the space will be reassigned to a new faculty member and a new project as requested. The VT-PGF committee will prepare a simple, one-page form for the faculty to request future space in the facility. Priority will be given in the following ways:

- 1) Funded projects will have priority over unfunded projects.
- 2) Faculty from VBI and the department of Biological Sciences will have priority over faculty from other departments or institutes.
- 3) Requests made earlier have priority.

All request forms will be supplied in duplicate and filed with the executive director and the greenhouse supervisor. The decision process will be transparent and available for all those concerned to see. Modifications to the priority system will be recommended by the VT-PGF committee and approved by the Head of the Department of Biological Sciences and the Director of VBI.

User responsibilities:

Facility Security: Access to the greenhouse facility and support areas is limited to authorized faculty. Users will be issued appropriate keys by the facility supervisor. Persons issued keys are responsible for the security of the facility. Doors are to remain locked at all times.

Cultural Care: Users are responsible for all plant cultural care (except daily watering needs and pest control). Users are responsible for following and implementing all transgenic and restricted plant requirements.

Pruning of old senescing parts should be done regularly to maintain health. Plants that are kept for long periods of time should be repotted to assure healthy growth. Overcrowding of floors or benches is to be avoided to prevent and or reduce pest incidence.

At the end of the experiment, discarded plant material and soil should be quickly disposed of in the outdoor garbage bin (see Plant Disposal below).

Pest & Disease Prevention: If at all possible, all plants should be started from sterilized seed within the facility using an appropriate soil mixture. Because of nutrient deficiency and pathogen infection, soil cannot be reused. Plants should be potted in clean pots (either new or used that have been washed and sterilized). To eliminate the possibility of pest introduction, the facility supervisor must inspect plants and materials brought in from areas outside of the facility. Users should arrange an appointment for inspection prior to bringing their plants and materials to the facility.

Monitoring: As users spend considerable time in the presence of their plants, they should also assist the facility supervisor in the examination and early detection of pest and plant health problems. Users should have a working knowledge of common plant health and pest symptoms and be able to spot any potential problems. In this way early treatment may be instituted, minimizing pest and disease effects.

Minimize Pest Spread: To minimize pest spread, keep all doors closed throughout the facility. Users should only use the main greenhouse corridor entry to their greenhouse section.

Greenhouse Cleanliness: Users are required to keep their growing facilities clean and in good order at all times. Growing facilities should be inspected weekly and all litter or plant debris removed. Dead leaves at the base of plants or on benches or floors should be removed and placed in a garbage container. Garbage containers should be emptied (outside in provided garbage bin) weekly. Large amounts of material for disposal should be removed immediately. Dirty pots or other paraphernalia should be removed from growing areas, cleaned and stored properly

At the end of the experiment, each greenhouse section used should be thoroughly cleaned of all material. Benches and floors should be cleaned and sterilized with the appropriate cleaning solution as directed by the facility supervisor.

Plant Disposal: Transgenic and restricted plants should be disposed of according to the appropriate guidelines. It is the researcher's responsibility to ensure proper disposal.

Environmental Controls: Users will not have access to environmental settings or programs (Wadsworth environmental control system). See facility supervisor for settings required for research projects.

Chemicals or Hazardous Materials: Users are to notify facility supervisor in advance of any chemicals or hazardous materials being brought into the facility. The user is responsible for proper use, storage and removal of all chemicals brought on the site.

Maintenance Cost recovery plan:

The facility will require funds for maintenance and some of those funds will be recovered from users of the facility. Maintenance of the facility includes, but is not limited to replacement of broken glass, lighting upkeep, cooling system upkeep, mechanical control system parts, irrigation system tools and parts, chemicals including pesticides, and student wages for watering. Also we include 20% of the facility supervisor salary. We estimate that the total cost of facility maintenance will be approximately \$11,600 / year. A recharge mechanism will be established through the controller's office based on the estimated annual maintenance cost per square foot of research bay space. We anticipate approximately 75% usage rate. Therefore, the cost of one research bay for a year can be estimated as:

$((\$11,600 / (0.75 \times 2160)) * 432 = \3093 . The cost for users will be prorated by months and by space utilized.

The account to receive the maintenance funds will be managed by the Department of Biological Sciences, and the disposition of funds from the account will be included each year in the facility's annual report.