

# Biological Sciences Plant Growth Facility (BIOL-PGF)

## USER HANDBOOK

(Printed copy located on desk in section 95)

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### Contact Information:

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- **Greenhouse Manager:** Bri Wills  
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- **Executive Director:** Dr. Susan Whitehead  
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### Facility Overview:

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The Biological Sciences Plant Growth Facility (BIOL-PGF) offers 3,240 square feet of plant growth space, divided into five separate 432-square-foot research bays and a smaller bay designated for site management and plant propagation. Each bench in the main research bays measures 6 feet by 18 feet (108 square feet), while the propagation

bench in the smaller bay measures 12 feet by 4 feet (48 square feet). The facility, located at 2410 Smithfield Road, is attached to the Ecosystems Simulation Laboratory (ESL; building #209), where restrooms are available. Limited parking, including disabled spaces, is also provided.

The facility operates under Biosafety Level 1 for Plants (BL1-P), which is suitable for experiments involving transgenic plants that are not likely to survive or spread in the environment and pose no environmental risk if accidentally released. For detailed information, visit: VT EHS Biosafety (<https://ehs.vt.edu/programs/biological-safety.html>).

### ***Facility User Fees:***

As a Virginia Tech service center, the BIOL-PGF charges researchers for bench space on a time basis. Fees, established by the Controller's Office in coordination with the facility director, help cover facility maintenance costs. Billing and fee collection are managed by the Biological Sciences financial office. The fee schedule is updated annually—contact the director or greenhouse manager for current rates.

### ***Environmental Control System:***

Each growth bay is individually controlled by a Wadsworth Enviro-Step computer-regulated system. Users can request specific temperature, humidity, and irradiance settings. Key features include:

- Power outlets and water sources in each bay.
- Rolling benches for maximum bench space.
- A sensor array for measuring temperature and humidity.
- Cooling via a wet cooling pad system supplemented with roof ventilation.
- Heating provided by one 8,000 BTU gas heater per research bay, along with a supplementary electric heater in each research bay.
- Six HID lamps per bay for supplementary lighting.
- An onsite climate station for measuring external environmental conditions.
- Centralized computer control for all environmental data and mechanical systems.

### ***Services Provided by Facility Staff:***

- Watering: A watering schedule will be developed for each research experiment in consultation between the user and the greenhouse manager before the experiment begins. The facility staff will provide watering once a day to be completed before noon. Additional watering frequencies must be provided by the user.

- **Pest Management:** The greenhouse manager will oversee all pest and disease procedures in the BIOL-PGF. These procedures will be designed to promote the pest and disease policy defined below. The greenhouse manager will be available for consulting about pest maintenance and treatment actions.
  - **Monitoring & Recording Pest and Disease:** The greenhouse manager will examine all plants within the facility for pest or disease problems on a regular basis (weekly). The presence of a pest or disease will be recorded (organism and date observed) and users will be notified.
  - **Treatment:** Once pests have been detected, identified, and recorded the greenhouse manager in consultation with the user will establish a pest control program for infected plants. The greenhouse manager will be responsible for carrying out the pest control program, recording the treatment, checking for success and making treatment information available to the user.

## **Research Space Request Procedure:**

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### ***Initial Inquiry and Consultation***

To begin the process of requesting space in the BIOL-PGF, contact the greenhouse manager or executive director to discuss your project. This consultation will help determine if your project aligns with the facility's capabilities and space availability. Be prepared to provide details about your project, including plant material, climatic needs, experimental requirements, hazardous materials, potential pest issues, watering schedules, and any safety concerns.

### ***Project Form & User Agreement***

Once your project is approved, you must complete the [Project Form & User Agreement](#), available as a word doc or pdf on the Biological Sciences Greenhouse [webpage](#). The completed form should be submitted to both the executive director and the greenhouse manager. This form includes an acknowledgment that you and any project workers, students, or helpers have read and understood the policies and procedures outlined in this user handbook. The greenhouse manager will post a copy of your Project Form on your assigned research bay door. It is the user's responsibility to keep a copy of your Biosafety Manual and/or Chemical Hygiene Plan in your research space and comply with all applicable VT EHS safety guidelines.

### ***Facility Access***

After your project is approved, you can request an access key to the facility and your designated research bay. The facility must remain secure, so please ensure that all doors are locked when not in use.

The Biological Sciences business office distributes keys. To request a key, complete the Biological Sciences [Key Request Google Form](#). Once submitted, you will receive a DocuSign form to review and sign. After processing, the business office will prepare your key(s) and notify you via email when they are ready for pickup. For any questions or assistance, please contact Rebecca Zimmerman (1-8924 or rdzimm@vt.edu) at the administrative office in Derring Hall, Room 2119, 926 W. Campus Drive.

### ***Plant Propagation***

Before your scheduled start date, you can work with the greenhouse manager to start your plants from seed or cuttings on the plant propagation bench in the facility (bench fees apply). If you plan to bring plants into the facility from another location, you must schedule an appointment with the greenhouse manager to inspect the plants for pests. Any pests found must be treated before the plants are allowed into the facility.

### ***Log Book***

The greenhouse manager will set up a log book for your research bay (pages on a clipboard). This log will be used to document the time-in, date, activity, and time-out each time the greenhouse manager and any student waterers enter the bay. These records will serve as a log of all activities related to watering or pest management for your experiment.

## **Policies and Procedures for Facility Use:**

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### ***Responsibilities of research users:***

Users must adhere to all procedures outlined in this handbook. If a researcher disregards these policies, the greenhouse manager will notify the executive director. The executive director will address the issue, and continued disregard may result in the researcher being asked to remove their project from the facility.

- ***Facility Security:*** Ensure that the main doors are locked at all times. A numbered key will be issued for the duration of the project and must be returned to the Biological Sciences Business Office upon project completion, unless a new project is starting immediately. Lost keys will incur a fee for rekeying and cutting new keys.
- ***Emergency procedures:*** Familiarize yourself with all emergency procedures detailed in this handbook.
- ***Cultural Care:*** Users are responsible for all aspects of plant care and experiment set up and protocols, with the exception of watering (maximum once daily provided by facility staff) and pest control. Ensure compliance with all transgenic

and restricted plant requirements. The greenhouse manager is available for consultation on plant growth, health, and pest issues.

- *Supplies (growth media, pots, labels, etc) and Storage:* You must purchase and provide all expendable supplies (e.g., pots, soil, fertilizer, labels) for your experiment. Label all supplies with your name and contact number. New or sterilized supplies must be used at all times. Limited storage is available for supplies before the experiment begins, and items such as pots and trash should not be left in the research bays; use the assigned storage bins in the hallway. Please discuss your supply needs and storage requirements with the greenhouse manager, as storage capacity is limited.
- *Growth Media:* We prefer that sterile growth media such as promix, perlite, vermiculite, or metromix be used for all experiments. However, we understand that in some cases non-sterile sand and or soil must be added to the growth media or used for plant growth. Soil or sand brought into the facility must be transported in containers to avoid any spillage during transport. Potting using non-sterile sand or soil must be done in the research bay assigned to the user. Spillage while potting should be cleaned up and removed after all plants are potted. Special cleaning care must be used at the end of the research experiment, to ensure that all soil and sand have been removed from the facility and disposed of appropriately.
- *Plant Disposal:* Transgenic and restricted plants should be disposed of according to the Institutional Biosafety Committee (IBC) approved protocols. It is the researcher's responsibility to ensure proper disposal of restricted plant materials. See link: <https://www.research.vt.edu/ibc.html>. Other plant material may be disposed of in the dumpster outside of the Plant Growth Facility.
- *Pest & Disease Prevention:* Users must adhere to all pest and disease prevention measures outlined in this handbook. Given their extensive time with plants, users should assist the greenhouse manager in monitoring for pests and plant health issues to enable early intervention and minimize pest and disease effects.
  1. **Planting:** Ideally, start all plants from sterilized seed within the facility using sterile media. If this is not possible, any external material must be inspected by the greenhouse manager for pests or disease before being placed in the research bay. Arrange an inspection appointment in advance. Plants will only be allowed in once verified to be pest and disease-free.
  2. **Growth Media:** Reusing growth media is prohibited due to nutrient depletion and pathogen risks. Always use clean pots (new or properly sterilized used pots).
  3. **Sterilization:** The greenhouse manager will sterilize all research bays with appropriate cleaning solutions before experiments and after to eliminate pests and pathogens.

4. **Pest Control:** The greenhouse manager might employ biological, and/or chemical methods to manage pests. Biological control agents can be introduced, and cultural and environmental conditions can be adjusted to support the needs of the plants and/or biological control agents. The greenhouse manager may suggest additional physical and/or cultural measures, such as pruning or maintaining bay cleanliness, which are the researcher's responsibility to implement in support of the pest control plan.
- **Research Bay Cleanliness:** Users are responsible for maintaining cleanliness in their research space at all times. Adhere to the following protocols to ensure a clean and orderly research environment:
    1. **Inspection and Cleanup:** Research bays, benches, and plants should be inspected weekly. Remove all litter and plant debris, including dead leaves from the base of plants, benches, or floors. Place waste in garbage containers.
    2. **Expendable Supplies:** Dispose of all used expendable supplies weekly. Empty garbage containers into the provided outdoor dumpster on a weekly basis. Large amounts of material for disposal should be removed immediately.
    3. **Pots and Containers:** Remove dirty pots from the research bays, clean them, store them properly, or dispose of them in the dumpster.
    4. **Overcrowding:** Avoid overcrowding floors and benches to prevent and reduce pest incidence.
    5. **Failure to Clean:** Researchers will be charged bench fees until all materials are removed from the research bay & facility and the space is properly cleaned. If the area is not cleaned by the end of use, facility staff will complete the cleaning, and a \$50/hr charge will be applied to the researcher's funding account.
  - **Research Documentation:** Research personnel/PI must maintain a copy of their Biosafety Manual and/or Chemical Hygiene Plan in their research space/section. All personnel working in the space/section must have signed off on the record in the manual or plan per Environmental Health and Safety guidelines. See link: <http://www.ehss.vt.edu/>
  - **Environmental Controls:** Users will not have access to environmental settings or programs (Wadsworth environmental control system). See greenhouse manager for settings required for research projects.
  - **Chemicals or Hazardous Materials:** Users are to notify the greenhouse manager 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 hazardous materials brought on the site.

- **Completion of the experiment:** Users must follow all procedures for completing a research experiment as outlined in this handbook:
  1. **Cleanup:** At the end of the experiment, thoroughly clean each research area of all plant material and associated items. Benches and floors should be cleaned and swept.
  2. **Disposal:** Discard plant material and soil promptly in the outdoor garbage bin. Ensure that all materials, including items from storage bins, are removed. Any hazardous waste or transgenic plant material should be removed and disposed of properly.
  3. **Bench Space Charges:** Charges for bench space will continue until all materials have been removed and the space has been cleaned.
  4. **Return of Keys:** Return all facility keys to the Biological Sciences Business Office.

### **Facility Emergency Procedures:**

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**Users must be familiar with all emergency procedures detailed in this handbook.** For additional safety procedures, consult the greenhouse manager or contact Environmental Health and Safety at <http://www.ehss.vt.edu/about>.

### ***Fire Emergency Information:***

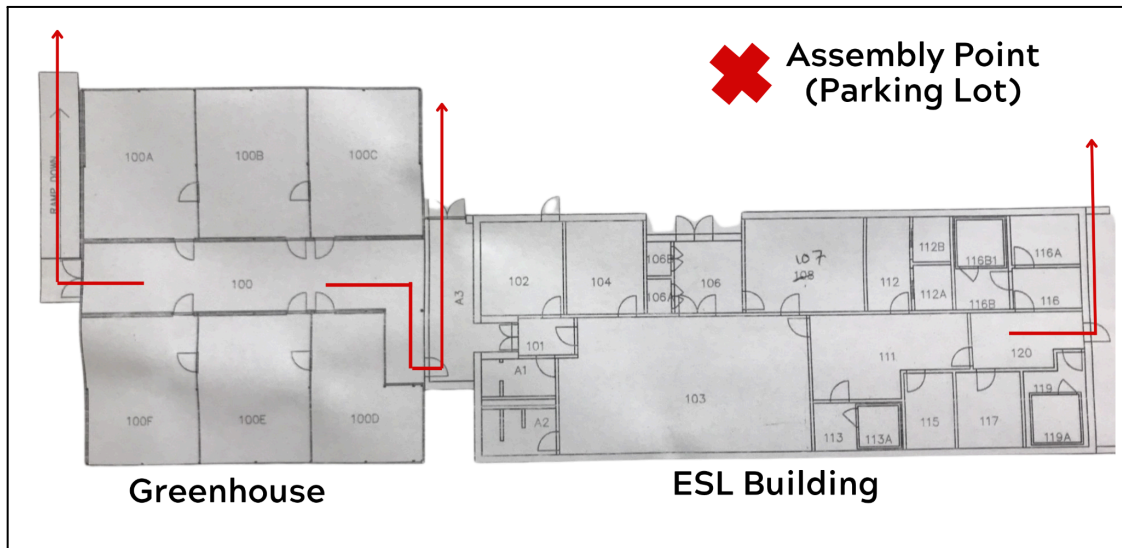
- **Emergency exits:** During an emergency, there are two exits from each end of the facility. During an emergency, leave the facility by the closest accessible exit.
- **Fire Alarm Location:** Near the main entry door on the right side.
- **Fire Extinguisher Location:** In the Ecosystems Simulation Lab corridor, right-hand side of the main bathroom door.

### **In Case of Fire:**

1. **Sound the Alarm:** If you discover or suspect a fire, activate the building fire alarm. (Near the main entry door on the right side.) If no alarm is present, alert others by knocking on doors and shouting "FIRE."
2. **Leave the Building:** Attempt to rescue others **ONLY** if safe to do so. Move at least 50 feet away from the building; out of the way of the fire department. Do not re-enter until instructed by the fire department.

3. **Call Emergency Services:** Dial 911 with your personal phone or use the emergency phone located in section 95 on the desk. Provide detailed information to the operator.

### Map of Evacuation Route:



### Emergency Equipment Locations:

- **Spill Kit:** Located in section 95, on the right side of the metal cabinet by the desk. Contains a 5-gallon Universal Spill Kit for oil- and water-based spills.
- **First Aid Kit:** Located in section 95, on the top left side of the metal cabinet by the desk.
- **Personal Protective Equipment (PPE):** Located in section 95, on the top right side of the metal cabinet by the desk. Contains gloves, safety glasses, and ear protection.
- **Eye Wash & Shower Station:** Located on the left side of the main door to the greenhouse.
- **Telephone:** Located in section 95, on the desk.
- **Chemical Hygiene Plan:** Located in section 95, on the desk.
- **Material Safety Data Sheets (MSDS):** Located in section 95, on the desk.