

BOYCE THOMPSON INSTITUTE PHYTOTRON FACILITY USE POLICY

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Introduction

The Boyce Thompson Institute Research Greenhouse is a 25,240 sq. ft. private, not for profit research facility, located on the Cornell campus in Ithaca NY. There are 20 greenhouses, 6 of which are air conditioned with chilled water and 14 are evaporative cooled, each at 480 sq. ft. All the greenhouses are controlled and monitored by an ARGUS computer automated greenhouse control system designed specifically to control the highly dynamic climate variable in greenhouses.

There are 15 walk in Conviron growth chambers with a total of 3,818 sq. ft. There are also 23 reach in Conviron chambers for a total of 398 sq. ft., a Dew Room that is 72 sq. ft., a 540 sq. ft. seed harvest room where plants can be finished, dried down and harvested. Additionally, there is a 600 sq. ft Plant Functional Genomics Room.

1.0 Introduction and Mission Statement

This document is intended to define policy for the Boyce Thompson Institute greenhouses, inform facility users, and serve as a guide for day to day greenhouse operations.

While there are some policy and operational differences between Cornell and BTI facilities, they are all managed in adherence to this general policy.

Mission:

Goal-

To use an Integrated Pest Management approach to achieve optimum plant growth and provide excellent facilities and services in support of the research staff.

Vision-

To operate a state of the art plant growth facility providing the highest quality research plants.

Focus-

A proactive service oriented approach that will anticipate the needs of the growth facility users.

The plant growth facility operates in compliance with BTI, Cornell, State and Federal Regulations including the Worker Protection Standard, Best Management Practices, all transgenic requirements and pesticide regulations.

2.0 CONTACT INFORMATION

BTI Greenhouse Office: – 254-1210 to reach greenhouse manager or staff.

Cornell Police: For information, or to report something that is not an emergency, call the Cornell Police at 255-1111.

Emergency: 911 - 24 hours/day service (police, fire, or medical) for any situation in which there is an immediate concern to preserve life or property.

Environmental Health and Safety: 255-8200, for 24 hours/day response to emergencies including chemical spills and environmental contamination. Provides chemical safety training and fire safety education.

<http://www.ehs.cornell.edu/>

Occupational & Environmental Health College of Agriculture & Life Sciences

<https://oeh.cals.cornell.edu/>

Best Management Practices for Cornell Greenhouses

http://greenhouses.cals.cornell.edu/BMP_Intro.html

EPA Worker Protection Standard

<https://www.epa.gov/pesticide-worker-safety/agricultural-worker-protection-standard-wps>

OSHA Hazard Communication Standard

<https://www.osha.gov/dsg/hazcom/>

Cornell Institutional Biosafety Committee Homepage

<https://www.ibc.cornell.edu/>

3.0 GREENHOUSE OR GROWTH CHAMBER SPACE REQUESTS

Prospective users of the greenhouses are encouraged to contact the greenhouse manager to discuss their needs prior to submitting a formal space request. When space is decided upon, fill out the [Greenhouse Environmental Control Request and Cultural Information Form](#) or the [Growth Chamber Control Request Form](#) and return it to the greenhouse manager. You will need to fill out an [Internal Services Form](#) to document your account number for billing purposes.

Space will be assigned on a first-come, first-served basis, consistent with policies governing the specific greenhouse requested.

It is not always possible to immediately accommodate requests for large areas or areas having special requirements. In these cases, early consultation with the greenhouse manager is particularly important.

When space issues arise that cannot be resolved by the greenhouse manager, they will be presented to the Greenhouse Plant Growth Facilities Committee for arbitration.

A. Fees, Rates and Other Charges

Rental Fees

Greenhouse space fees are collected to offset expenses for supplies, equipment, and personnel. Space fees are set by the administration in consultation with the Greenhouse Manager and the Plant Growth Committee.

Greenhouse space charges are levied based on the bench area occupied. Where benches are not used, the fee will be based on the bench area that would normally be installed in the space, or the area actually used, whichever is greater.

Greenhouse and chamber charges are calculated on a monthly basis. The billing cycle runs from the first of the month to the last day of the month.

All fees are figured on a square footage basis at a flat rate found on the [Greenhouse and Growth Chamber Space Inventory](#) form.

Fees will be re-evaluated on an annual basis and are subject to change.

[Greenhouse and Growth Chamber Lighting Inventory](#)

Hourly Rate Service Charges

The labor rate for services not included in basic rental fees is also found on the [Greenhouse and Growth Chamber Space Inventory](#) form. You will need to fill out an [Internal Services Form](#) to document your account number for billing purposes.

[Greenhouse Department Job Request Form](#)

There will be a charge for the modification of any growth space from the standard layout. There will be an equal charge to return the space to its original layout. Estimates will be provided upon request.

The greenhouse staff will provide an inventory of commonly used pots and trays. After use, the dirty pots will be disinfected and washed at no extra charge to the user.

Pots, trays, cones, etc., that are not part of the inventory, and are purchased by the projects, may be washed at no charge if they are added to the inventory at the end of the project. If they are not to be added to the pot inventory, an hourly pot-washing fee may apply.

When a project gives up a growth space, there will be an hourly cleanup charge to clean and disinfect for the next user.

Hourly charges may apply when the greenhouse staff needs to perform services that are the responsibility of the growth space users.

Experiments requiring constant attention may be subject to an hourly charge. For example, when the environmental conditions of an experiment exceed the capabilities of the control system and constant manual adjustments are required or when special watering or fertilizing needs require a large time commitment from the greenhouse staff.

B. Annual Renewal of Space Requests

Long-term users of a greenhouse or growth chamber should renew their space request annually by completing a [Greenhouse Environmental Control Request and Cultural Information Form](#) or the [Growth Chamber Control Request Form](#) and returning it to the Greenhouse Manager.

Long-term users of growth space (greater than one year) are required to notify the Greenhouse Manager 4-6 months before giving up space.

C. Exit Date

In order to provide efficient space allocation and orderly transition from one greenhouse user to the next, users are required to provide a firm exit date with their space requests.

If it becomes apparent that a project will extend beyond the stated exit date, contact the Greenhouse Manager as soon as possible. Extension of the exit date may not be possible if a commitment has been made to provide the space to another user.

Greenhouse users will be held to the stated exit date if another user is waiting to use the space.

Long-term users of a greenhouse or growth chamber who will be finishing their project and giving up space should notify the greenhouse manager 4-6 months before vacating the space.

D. Space Held in Reserve

To promote the fullest utilization of the greenhouses, unoccupied areas held in reserve at a user's request *will be charged for* as if the space were occupied.

Users wishing to reserve an unoccupied space for longer periods may ask the greenhouse manager to attempt to find a short-term user for the interim. There is, however, no guarantee that such an attempt will be successful.

E. Space Sharing

Users should not share growth space with other projects unless a request has been made and approved by the Greenhouse Manager.

4.0 SERVICES PROVIDED BY GREENHOUSE PERSONNEL

All plant material receives plant care unless the greenhouse user requests otherwise. The fee for plant care will be charged even if some components are declined by the user. The greenhouse staff may provide additional services at an hourly rate of \$30.00/hr.

Watering 365 days a year

Pest and disease scouting

Cultural, biological, or chemical pest control measures in consultation with facility users

Environmental control

Photoperiod control

Graphing of temperatures upon request

Stocking of commonly used pots, trays and some supplies

Stocking of commonly used soil and soilless media for plantings (advance notice needed for large plantings)

Greenhouse maintenance

Routine greenhouse sanitation

Plant material autoclaving (material must be properly harvested, bagged and taken to the autoclave area by the user). Labs that have pathogen or pest infected plants should make other arrangements for autoclaving their plant material to prevent the spread of the pathogen or pest.

Routine application of fertilizer in accordance with users' request

Routine washing of inventoried pots and trays. If labs have ownership of pots or trays to be washed, they can use the greenhouse pot washing area if available. If the greenhouse staff is asked to wash the pots or trays a \$30.00/ hr. charge is applied.

5.0 SUPPLIES PROVIDED

The following supplies will be provided:

- Selected sizes and styles of bamboo stakes, twist ties and pot labels
- Autoclave bags
- Various cell pack inserts
- Clear germination domes
- Various types of 4" – 8" pots
- Selected nursery pots
- Selected cell trays with and without holes

Soil mixes and Components:

- Cornell Mix
- Cornell Mix + OSMO
- Metro Mix 200
- Metro Mix 360
- Pro-mix BX
- Sand
- Vermiculite
- Perlite
- Peat Moss
- Turface
- Field Soil

Note: Contact greenhouse staff for details regarding supply use and location. Custom soil mixes can be provided but an hourly labor charge for mixing may apply.

6.0

GROWTH FACILITY USER RESPONSIBILITIES

Growth facility users must share the responsibility for quality plant care with the greenhouse staff. Open communication regarding the monitoring and maintenance of plant demands will facilitate optimum plant development, reduce problems and promote productive relationships between users and staff.

Growth Chamber Policy

Background: Plants in growth chambers are susceptible to multiple pests and pathogens such as Powdery Mildew, Thrips and Aphids. Past experience has shown that our most effective way to reduce the risk of pests and pathogen outbreaks during growth of plants is to use a three-stage, rotational chamber system. Seeds are sown and placed in a germination chamber, then moved to a vegetative growth chamber and finally to a seed harvesting room. Multiple research groups use this system to grow flats of a wide variety of plants in several large (Conviro 432) walk-in chambers.

Problems: The benefits of cycling plants are only realized if plants are moved from one chamber to another in a timely fashion. A breakdown in this process has several consequences. Because many of the plants grown in these chambers are transgenic, we must comply with Federal guidelines to prevent release into the environment. As the plants mature and senesce, seeds drop from the plants and end up down the drain, on the floors, shelves and into other researcher's flats. Furthermore, the IPM process is only effective when followed completely. This policy has not been consistently observed which impacts all users of the growth facilities. Importantly, if one of the users does not follow the chamber policy, it can negatively impact all the other users.

Policy: The following growth policy will be formally implemented and reviewed by all users to reduce the spread of pests and pathogens and maintain compliance with transgenic regulations.

1. Every flat or pot must be labeled with the individual's name, lab and planting date.
2. Pots and flats will be placed in a germination chamber for a maximum of **4 weeks** after planting. Plants must then be moved to the vegetative growth chamber.
3. For most cultivars/accessions, the time in the mature plant chamber should be approximately **4 to 5 weeks** after transfer from the germination chamber.
4. Plants should be removed from the chamber **before they begin dropping seed**. If some plants in the flats are not ready to dry down at this time, lighted shelves are available for rental in the harvest room and the greenhouse staff will continue to water plants on these shelves. There is also space available for each lab to dry down plants in the harvest room.

Action Items: The above policy has been in place for many years, however, some users have not followed the guidelines. Thus, the greenhouse committee has recommended instituting fees for additional labor and time of the greenhouse staff associated with non-compliance.

1. If necessary, the greenhouse staff will notify users and PI's by e-mail that plants must be moved to a new growth chamber or the 'dry down' room.
 - a. E-mails will be sent as a last resort before billing. It is important to remember that it is the responsibility of the user to make sure plants are properly maintained, moved and harvested.
 - b. Users must bear in mind that an e-mail is a **courtesy**. **It is the responsibility of the user** to monitor the progress of plants and transfer when necessary.
2. If the greenhouse staff must transfer flats, the PI will incur a **\$30 transfer fee** (per occurrence).
3. The greenhouse staff will label flats that are ready for harvesting with a "remove by this date" sticker when the soil and plant tissue are completely dry.
 - a. This will allow for a 4-week grace period for harvesting and disposal of seed flats.
4. If plants are not removed by the harvest date, flats will be bagged, dropped off at the PL's lab for disposal and the PL will incur a **\$60 disposal fee**.
 - a. The disposal of plants to a PL's lab is not intended as a 'service' but rather the final option of the greenhouse staff.

These charges are necessary to ensure the overall health of plants in the chambers and ensure that a single user's negligence does not impact the research of multiple PI's. Communication is critical between the greenhouse staff and users to help ensure that charges are kept to a minimum.

User responsibilities include:

- Keeping growth areas clean. Supplies should not be stored in the greenhouse or growth chambers. Lockers provided to the projects for supply storage.
- Removing unwanted plants from growth areas immediately after finishing with them.
 - Non-transgenic plants must be put in a covered container and taken directly to the outside, green compost bin, provided there are **NO transgenic plants in the growth area.**
 - Transgenic plants must be bagged inside the growth room and taken directly to the autoclave area. **Remember**, if even **one plant** in the growth

space is transgenic, **all plants** in the growth room must be considered transgenic and must be autoclaved.

- Communicating plant care issues (insects and diseases, fertility, etc.).
- Keeping growth and work areas sanitary and orderly.
- Using proper pot size and pot filling technique to reduce watering demands.
- Keeping plants staked, tied, pruned and properly spaced at all times. Proper spacing will ensure air movement as well as provide access for watering and pest control measures.
- Placing pots only on bench space, not on floors or windowsills.
- Removing any plant parts such as fruit, flowers, and plant parts or clippings from benches and floors and disposing of properly.
- Washing pots or trays that are not part of the growth facility inventory. The greenhouse staff may wash them for an hourly service charge.

All plants should be germinated from seed in the BTI growth facility or come from our tissue culture department. If plants must be moved to the BTI growth rooms from outside BTI, prior arrangements must be made with the Greenhouse Manager for plants to be inspected for pests or disease. These plants may be required to be quarantined resulting in a space charge.

7.0 COMMUNICATION

So that the greenhouse staff can best address users' needs, please promptly inform the greenhouse staff and/ or manager of:

- Alarms
- Pests on plants
- Malfunctioning equipment
- Any situation that you think may require attention
- Users should respond without delay to queries or requests from greenhouse staff.
- Notify the greenhouse manager promptly of changes in project requirements.
- If requested, the greenhouse staff will give users advance notice of pesticide applications or other greenhouse closures by email.

8.0 PLANTS

A. Bringing Plants Into BTI

The greenhouse manager must be given reasonable, advance notice before plants not grown in BTI are brought into the greenhouses or growth chambers.

Incoming plants will be inspected for pests and diseases.

Pest control measures or quarantine may be required before moving plants into the assigned greenhouse or chamber. In the case of quarantine, a monthly space and cleaning charge will apply.

In certain cases of pest infestation or disease, plants may not be allowed into the growth chamber or greenhouses.

If plants are brought into the chambers without advance notification, they will be removed and placed in quarantine. Space and cleaning charges will apply.

B. Potting Plants

Consult with the greenhouse manager or staff before choosing a pot size.

Pots must be of adequate size to support the expected size of the plants and to reduce watering requirements.

Fill pots to 80 – 85% full (or just above the shoulder) after settling, in order to provide sufficient headspace for watering.

Repot into larger pots before plants require watering more than twice daily.

Repot into larger pots before tall plants become prone to toppling over.

If these requirements are incompatible with the experimental design, consult the greenhouse manager.

C. Spacing Plants

Consult with the greenhouse staff or manager before determining the plant spacing to be used.

Plants must be spaced far enough apart to allow for:

- Adequate airflow
- Watering without wetting foliage
- Scouting for pests
- Access for pest control measures

Request enough greenhouse space to accommodate plants at their ultimate size and spacing.

9.0 HOUSEKEEPING

Integrated Pest Management starts with a clean greenhouse. The greenhouse facilities are in operation 365 days per year and may be toured or inspected at any time. Users are required to assist with general clean up to maintain a safe, sanitary, and orderly work environment for fellow researchers and support staff.

General housekeeping requirements for users are:

- Clean worktables and/ or potting benches after potting.
- Clean floors and benches during and after terminating experiments.
- Discard material from large experiments as they are terminated, directly to autoclave bags or the outdoor compost bin.
- Use the compost cans provided. Replace the lids to reduce insect and disease potential.
- Clean sinks after each use and limit the amount of soil going down the drains.

The greenhouse staff also performs general clean up, but needs assistance from users when work demand is high and / or large experiments are being discarded. In cooperation with the users, the staff will:

- Wash and/ or sweep floors of greenhouses and potting areas on a regular basis.
- Empty trash and compost cans once per week.
- Sanitize and disinfect houses between users, or whenever possible in continuous use areas.
- When possible, ASSIST projects with large clean up tasks.

Storage:

Storage space within the greenhouse facilities is limited. Items left in the chambers and greenhouses without prior approval from management may be removed by the greenhouse staff. Storage lockers may be provided upon request if they are available.

Composting

Do Not Compost

- Plastic coated paper
- Plastic stakes, labels, pots, bags, twist ties or gloves
- Large woody material (nothing greater than 2")
- Rock wool or manufactured soil media substitutes
- Transgenic, diseased or insect infested material unless it has been adequately autoclaved

Compost

- Plant material
- Clay, sand, soil and any natural soil media
- Small amounts of fertilizer
- Woody stems smaller than 2" diameter

10.0 BEST MANAGEMENT PRACTICES AT CORNELL

All greenhouses on the Cornell campus in Ithaca practice Best Management Practices (BMPs).

BMPs are practices that achieve environmentally optimum management of water, nutrients and pest control materials in greenhouses.

All individuals who work in and around greenhouses on the Ithaca campus, including greenhouse staff, faculty, technicians, undergraduate and graduate students, the CU Grounds Department, and maintenance staff, must follow the Cornell BMPs.

The Best Management Practices are divided into six major categories of greenhouse activities:

1. Pesticide and Fertilizer Storage
2. Nutrient Management
3. Pest Control
4. Weed Control
5. Maintenance
6. New Greenhouse Construction

Greenhouse staff are fully trained in the expectations of Cornell's BMPs. All other faculty, staff and students are expected to work with the greenhouse staff to minimize the potential or actual discharge of pesticides and fertilizers to the drain system.

At a minimum, all greenhouse users must:

- Store all pesticides and fertilizers in designated locations and follow facility procedures for secondary containment and labeling.
- Mix pesticides and fertilizers over secondary containment.
- Keep greenhouses clean to prevent the development of disease and insect problems.
- Water with care.
- Report maintenance problems (e.g., leaky pipes, damaged glazing) to the greenhouse staff and/ or manager.

For a complete copy of Cornell's BMP Plan, [click here](#).

11.0 GENERAL SAFETY

- Safety takes the highest priority at BTI.
- Communicate with the greenhouse manager or your Safety Committee representative when you see an unsafe condition or act.
- Cooperate with the manager to ensure your own safety, as well as that of your colleagues.
- Know the location of all safety equipment, including fire extinguishers, emergency showers and eyewashes, phones, and first aid kits.
- Know the emergency evacuation procedure for your area.
- Know where to find safety information, including material safety data sheets and pesticide labels.
- <https://ehs.cornell.edu/shipping-and-transportation/hazardous-materials-shipping-dot>
- Know where emergency phone numbers are posted.
- <https://emergency.cornell.edu/>
- Closed-toed shoes must be worn.
- No food or drinks are allowed in plant growth areas or areas of possible pesticide contamination.
- Attend Worker Protection Standard training if you will work with pesticide treated plant materials.
- Employees and students handling pesticide treated plant material are strongly encouraged to wear gloves and to wash their hands after working in a greenhouse.
- Only a commercial pesticide apprentice, certified commercial technician, or certified commercial pesticide applicator may make pesticide applications at BTI and Cornell.

Chemical Use Policy

- To comply with the Hazard Communication Standard, all chemicals in the greenhouse area need full labels on the containers. SDS sheets need to be immediately available. Lab chemicals should not be stored in greenhouses, chambers, or lockers and should not be left unattended in the greenhouse area.
- If there is a chemical spill in the greenhouse area, follow the Emergency Procedures Guide. Contact a greenhouse assistant to assist with the emergency or help with spill clean-up.
- For pesticide spills, follow the CALS spill clean-up guidelines.
- **Remember, *ALWAYS* use secondary containment to prevent spills.**

12.0 THE WORKER PROTECTION STANDARD

The Worker Protection Standard (WPS) is a federal regulation intended to reduce the risk of pesticide poisonings and injuries among agricultural workers who are exposed to pesticide residues. At BTI, the WPS applies to all employees, including undergraduate student employees and graduate students, who handle pesticide treated plant materials.

The WPS requires BTI to assure that untrained workers receive basic pesticide information before they work with treated agricultural plants. Anyone who has not attended the complete WPS training before initial exposure to pesticides or pesticide residues must complete a form entitled **WPS REQUIREMENT TO PROVIDE BASIC PESTICIDE SAFETY INFORMATION TO UNTRAINED WORKERS**.

WPS REQUIREMENT BASIC TRAINING

Employees must attend WPS training **before** working in any greenhouse that has been sprayed with pesticides for 30 days after the REI. Certified pesticide applicators do not need to attend this training.

All individuals who work in a greenhouse must be aware of:

- The location of the central posting board for their work area. The central posting board contains pesticide safety information, emergency numbers, and a pesticide application list for the facility.
- The need to attend and understand WPS training
- The location of a decontamination site, equipped with clean water, soap and single use towels, and a change of clothes (e.g., a coverall or Tyvek suit).
- Their right to receive emergency assistance should there be reason to believe that they have been poisoned or injured by a pesticide.
- The required posting of all greenhouse applications (the “Keep Out” sign).
- The severe restrictions on access to treated areas during the restricted entry interval (REI).

More about REIs

Access to greenhouses is severely restricted during a restricted entry interval (REI) when the “Keep Out” sign is posted on the greenhouse door. The WPS allows entry into a treated area that remains under a REI only in three specific work situations:

- Short term tasks that last less than 1 hour and do not involve hand labor,
- Emergency tasks that take place because of an agricultural emergency, and
- Specific tasks approved by EPA through a formal exception process.

Anyone that must perform an early entry task must:

- Wait at least 4 hours after the pesticide application is completed, and
- Wait at least until any inhalation exposure level listed on the product labeling has been reached or any WPS ventilation criteria have been met, and
- Spend no more than 1 hour in a 24-hour period on short term early entry tasks or do only those tasks relating to mitigating an emergency situation.

Anyone performing early entry work must be provided with:

- Personal protective equipment
- Any protections required by the pesticide labeling for early entry tasks
- Protections that are the same as for other workers:
- Information at a central location
- Emergency assistance
- Restrictions during applications
- Notice about applications
- Training and instructions
- Decontamination sites

BTI strongly discourages any greenhouse entry during a restricted entry interval.

More information about the Worker Protection Standard is available from the greenhouse manager or you can go to the EPA Worker Protection Standard at <https://www.epa.gov/pesticide-worker-safety/agricultural-worker-protection-standard-wps>

13.0 BIO-HAZARDOUS AND TRANSGENIC PLANT MATERIALS

All research involving transgenic plants **must** be registered with the Institutional Bio-safety Committee (IBC). For more information, visit:

<https://www.ibc.cornell.edu/>

Certain plants **must** be autoclaved before disposal, including those that are:

- transgenic
- virus-infected
- legally quarantined
- otherwise biologically hazardous
- otherwise required to be autoclaved by research protocols
- all other plants in the same growth room as above listed plants

Project personnel are responsible for:

- picking up an autoclave bag from the autoclave area in the head house
- bagging all plant material, fruit and plant parts in the greenhouse or growth chamber
- working with the greenhouse staff to ensure the material is autoclaved
- making sure there is no plastic in the autoclave bags

Autoclaving will be done by the greenhouse staff.

14.0 PATHOGEN AND INSECT USE POLICY

BTI Pathogen Use Committee 4/7/04

Recommended Guidelines for Pathogen and Insect Use at the Boyce Thompson Institute

1. The Pathogen Use Committee (PUC) will review all pathogen use in BTI Plant Growth facilities. A written request for use of new pathogens must be submitted by the Principal Investigator (PI) to the Greenhouse Manager and the PUC prior to use in BTI Plant Growth facilities. The PI will be asked to complete a Pathogen Use form (see Appendix A) to be reviewed by the PUC. If the PI is proposing to work with recombinant pathogens, he/she will be asked to submit a current rDNA MUA and Greenhouse/Growth Chamber Manual approved by Cornell's Institutional Biosafety Committee (IBC), which will be kept on file in the Greenhouse Office.
2. Each request for use of a new pathogen will be reviewed by the PUC, and space will be allocated to the laboratory by the Greenhouse Manager. If a pathogen is considered "high risk"² by the PUC, the Greenhouse Manager will attempt to find space within the BTI Plant Growth facilities that can be shared with other labs already using the pathogen successfully under strict containment measures (e.g., Tobacco Mosaic Virus or TMV). Alternatively, the Greenhouse Manager will attempt to locate space at Cornell that is already being used for the pathogen in question and can be shared with BTI scientists.
3. Compliance with containment procedures to prevent pathogen spread to non-target hosts is critical to keep BTI Growth Facilities functioning optimally for all users. All lab members who work with pathogens must understand and follow necessary containment measures for the pathogens they use. Their signature on the Pathogen Use Form will indicate that they have read and agree to comply with all necessary containment measures as outlined.
4. Some general guidelines for pathogen containment are as follows:

When possible, inoculate plants in the laboratory to keep high concentrations of pathogens away from the Plant Growth Facilities.

Transport infected plants on designated carts, which may need to be covered prior to moving infected plants. Clearly mark carts that are to be used only for designated pathogens. After use, clean and decontaminate carts.

Do not visit "clean" growth chambers or greenhouses after having gone to a pathogen containing chamber the same day.

The one-glove-rule applies in the Plant Growth Facility as well as other BTI locations.

²High risk pathogens are defined as those that 1) have a broad host range that includes plants commonly grown in BTI Growth Facilities, 2) spread easily by wind, water, touch, or environmental conditions commonly found in BTI Growth Facilities (e.g., saturated soil or free water), 3) are highly virulent and have the potential to kill large numbers of plants quickly, 4) are difficult to remove from the facility once an infestation occurs, or 5) are difficult, if not impossible, to remove by standard decontamination measures (e.g., TMV).

[Insect use survey](#)

[Pathogen use survey](#)