

Policy for the use of the Ashland Road Plant Growth Facility Greenhouses 2012

Contacts:

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Training Requirements:

It is the responsibility of the assigned user to ensure that all personnel under their supervision are familiar with these policies. All principle investigators, staff and student workers are required to read this policy and pass a quiz with a score of at least 90% before keys will be issued for access to the facility. Growth space will be periodically inspected by greenhouse staff and PI's (or designated contact) notified of violations. Failure to rectify violations by the given deadline will result in greenhouse staff stepping in to fix the problem at a recharge rate of \$25.00 per hour. Continual violations will result in loss of greenhouse space.

All persons using greenhouse or growth chamber space must be Worker Protection Standards trained. Contact Michelle Brooks to schedule a 30 minute appointment.

Facility Access

The Ashland Road Greenhouse main doors will be open from 7:30 am – 4:30 pm Monday – Friday. Keys will be issued to individuals for greenhouse room padlocks once the quiz has been passed. Those requiring after hours/weekend access will be issued outside door keys as needed.

Parking is limited at the facility. **NO** overnight parking is permitted. Individuals may only park at the facility while they are in the greenhouse working! Do not park at the greenhouse and then walk to class, the lab or to the field! You must have a MU parking permit for some other lot on campus to be able to park here without getting a ticket.

Use of Facilities and Sanitation

1. General Cleanliness - All users of the Ashland Road PGF are expected to observe good housekeeping rules by returning equipment and unused supplies to proper storage areas and by cooperating in keeping the facilities clean and orderly. Sound sanitation practices are necessary to reduce, if not eliminate, disease and insect problems. Bench tops and floors should be kept clean of plant/soil debris at all times. Brooms/dust pans are provided for daily use. Take every precaution to avoid getting potting media or plant debris on the gravel floors. This is the only method of drainage in the greenhouse and if the gravel gets clogged with debris it will impede drainage.

2. Tools/Containers - Use clean, sterile containers and tools. Avoid putting plant material, containers, or tools on the floor or other "contaminated" surface. The floor is not a desirable work area. All used pots and containers should be cleaned/sterilized immediately and returned to assigned storage areas.

3. Potting Media - The use of premixed media is strongly encouraged. It is the responsibility of the individual user to obtain their own potting media. Keep in mind storage space is non-existent, therefore all media must be stored in your greenhouse space so only order quantities you will use quickly! You can obtain Promix locally from McConnells Plantland located at the Midway Exit on I-70 phone: 445-5415. Other brands or individual media components can be ordered through Hummerts. (Please give advance notice of a pending delivery to the Ashland Road greenhouses by contacting Michelle Brooks). All opened bags of media must be stored in sealed containers or tubs. Take care not to contaminate the sterilized media in tubs. Only use clean scoops, dustpans, and brushes on bench surfaces.

4. Field Soil/Sand: If your research requires field soil or sand, it is highly recommended that you steam sterilize the media before using it. There is a steam wagon you can use at the Ashland Road facility. Contact Rich Wilman for directions on how to operate the system. You must sign up to use the steam wagon on the chalkboard in greenhouse 20. A stock pile of standard field soil is available for use at the facility. A soil mixer is also available for use for blending media. Sign up to use the mixer on the chalkboard in greenhouse 20.

5. Hoses - All watering hoses should be stored off the aisle walkways, and breakers/nozzles must be kept off the ground. **Do not drink from hoses!**

6. Pests - Report all insect and disease problems to the Michelle Brooks immediately so that their spread can be contained. All requests must be submitted in writing either by filling out provided form in the greenhouse 20 hallway or by email to Michelle Brooks. After the request is submitted, the room will be scouted closely to determine necessary action. If pesticide application is needed, it will be done Tues. or Thurs. evenings after 4:30 pm by trained greenhouse personnel only. A treated greenhouse will be posted and locked until the Restricted Entry Interval is expired. No early entry by greenhouse users is permitted. It is strongly encouraged for you to schedule a 2 week period in July that the greenhouse can be emptied, thoroughly cleaned and "cooked" out to help control pests. (See pesticide policy section for more detailed information.)

7. Storage – There is no central storage space at the Ashland Road PGF therefore storage of media, fertilizers and containers is allowed in your greenhouse room at this facility. **HOWEVER**, Keep in mind that all items stored need to be clean, organized and not blocking door or aisle access. Do not block access to exhaust fans or the cooling pads. Please do NOT order large quantities of supplies! Only items intended for use in the Ashland Road Plant Growth Facility may be stored here. Do not use this facility to store supplies for your lab or field research! Smaller items such as fertilizer and labels should be kept in secondary waterproof tubs. **Absolutely no supplies should be stored in the greenhouse hallways!!!!** The only items in the hallway should be common use

equipment such as trashcans, carts and wheelbarrows. Do not store any supplies outside of the greenhouse facility. Temporary storage of media piles near the soil mixer may be allowed with prior approval from Michelle Brooks. These piles may not remain for longer than 2 weeks and may not block any parking spaces.

8. Living material – Bringing in live plant material is permitted at this facility, however, please make every effort to confirm that there are no pests on the plants before bringing them in! If you need help scouting something contact Michelle Brooks. Moving plants between greenhouse spaces is **highly discouraged** as it will spread pest problems quickly.

9. Hazardous Materials - The greenhouses in the Ashland Road PGF are considered laboratories. Environmental Health and Safety conducts inspections biannually. No food or drink is allowed inside the greenhouse or growth chamber units. **Do not drink from hoses! ALL substances must be stored in a closed container and clearly labeled.** This includes, DI wash bottles, fertilizers, etc. Culligan tanks must be secured to the wall.

10. Potting Table/Sink use – There is one potting table in the hallway of greenhouse 19 that may be used for preparing media and filling pots. **Clean up all of your things immediately when you are done** so that the table is available for others to use. There is a sink in the hallway of greenhouse 18 that may be used for washing pots, however, you must get prior permission from Michelle Brooks to use the sink due to the difficulty in cleaning the soil trap. Brush any loose dirt out of the pots into the trash can to avoid clogging the drain. If you notice the water draining slowly, the soil trap may be full...contact Rich Wilman for cleaning. You may not store dirty pots in hallway for any period of time...Cleaned pots may be stacked on the sink for a short time for drying. As soon as they are dry, they should be moved to the appropriate storage area. Please do not use the sink in the hallway of greenhouse 19 or greenhouse 20 for washing pots as there is no soil trap on those sinks!

11. Disposal of unwanted material –Several trashcans are located in the greenhouse hallways. These are for collection of daily general trash (plant trimmings, disposable gloves, paper trash, the occasional dead plant) and will be emptied twice weekly by greenhouse staff. Currently, MU is not keeping plant material waste separate from general trash so there is no need to separate trash at this point.

When an experiment is terminated, it is the responsibility of the user to take this unwanted material directly to the dumpsters at the south entrance of greenhouse 21. Please do not pile all the hallway cans full!

If you are inoculating plants with insects, pathogens or nematodes you must first autoclave the material before disposing of it!

The autoclave is located in the hallway of greenhouse 21. Please sign up to use the equipment on the chalkboard in the hallway of greenhouse 20.

Autoclaving steps:

1. Gather material in autoclave bags. Do not overfill – they get heavy!

2. Tie bag shut and label with your PI name and greenhouse room number
3. Take to autoclave in greenhouse 21 and immediately autoclave the material
 - a. Get operation instructions from Michelle or Rich
 - b. Sign your name, date and time on the autoclave log so we know who's material is in the autoclave at all times
 - c. If the autoclave is currently in use, plan to come back in a few hours to put your items in.
4. As soon as cycle has completed, remove your material.
5. Environmental Health and Safety requires autoclaved bags then be placed inside a black trash bag.
6. Take immediately to the dumpster
7. Make sure the bottom of the autoclave and drain screen are cleaned after use

Environmental Control

1. Greenhouse thermostats and HID light time clocks may be adjusted as needed by the individual users. If you need assistance in this matter, contact Rich Wilman or Michelle Brooks.
2. A high/lo thermometer is provided in each greenhouse. It is up to the user to read and reset this thermometer if you wish to have that data. Please leave the thermometer facing north near the center of the room at bench height to get accurate readings.

Maintenance

1. Any problems with structure or non-dedicated-user equipment should be reported to Rich Wilman.
2. Maintenance of plants and equipment dedicated to individual projects is the responsibility of the greenhouse user.
3. Please be aware that the greenhouse staff, as well as the Campus Facilities employees, must have access to certain areas in your greenhouse for maintenance purposes. Please make sure the area near the exhaust fans and the evaporative cooling pads is clear so the greenhouse staff can get to them for weekly maintenance. Do not store anything on top of or behind the fin tube heating. This area should NOT be used for drying samples.

Alteration of Facilities

Approval must be obtained from Michelle Brooks before any changes, deletions, or additions are made to the permanent facilities.

Experimental Hazards

1. The use of hazardous materials, organisms, or systems (e.g., radioactive materials, dangerous non-pesticide chemicals, UV lamps, pollutants, etc.) in greenhouse experiments must be approved by Michelle Brooks. A minimum of two weeks notice is required prior to the use of any such materials or systems in the greenhouse.
2. Rooms in which hazardous materials/conditions are present must be kept locked. The rooms must be labeled with appropriate warning signs. Emergency contacts and procedures must also be posted. Insects must be contained in appropriate cages or tents.

Transgenic Plant Research

All PI's using transgenic plants in their research must submit an application for approval to the campus Institutional Biosafety Committee (IBC). IBC will evaluate the containment level designation for the proposed research. Information regarding IBC and plant research can be found at:

<http://ehs.missouri.edu/bio/ibc/ibc-transgenicplants.html>

Projects determined by IBC to be exempt under NIH Guidelines may be grown at Ashland Road without any additional containment precautions. NOTE: *Although some projects may qualify as exempt from the NIH Guidelines (USDA & FDA approved), **all projects that involve the Environmental Release of Transgenic Plants and Seeds must register by completing an IBC Application.** Research projects will be assessed by the IBC on an individual basis.* PI's growing commercially released transgenic plants in the greenhouse must still complete the IBC application to confirm the exempt status. Projects requiring Biosafety level 1 containment may be grown at Ashland Road with additional containment precautions.

- All entrances to the facility must remain locked to restrict access of the general public (including room door, main entrance doors and garage doors)
- Project information must be submitted to the greenhouse coordinator for posting at the location. This will include primary and secondary contact name and phone number, rDNA number, and a general description of the project in layman's terms.
- PI's shall keep a record of experiments currently in progress in the greenhouse facility.
- Transgenic material must be marked to distinguish it from non-transgenic material. Precautions should be taken to separate transgenic and non-transgenic plants to avoid inadvertent cross pollination.
- Procedures that prevent the dissemination of genetic material by pollen or seed should be implemented. Examples include:
 - cover or remove flower and seed heads to prevent pollen and seed dispersal
 - Harvest plant material prior to sexual maturity
 - Use male sterile lines
 - Ensure that experimental plants flower at a time of year when cross-fertile plants are not flowering within the normal pollen dispersal range of the experimental plant
 - Ensure that cross-fertile plants are not within the pollen dispersal range of the experimental plant.
- All transgenic material must be rendered biologically inactive (autoclaved) before disposal.

The PI is ultimately responsible for the research project and for ensuring compliance with biosafety standards.

Projects requiring Biosafety Level 2 or higher cannot be grown at Ashland Road Greenhouse Complex.

Shoes and Clothing

Appropriate footwear is required for greenhouse staff, users, and visitors. No open-toed shoes should be worn in the greenhouse.

Severe Weather Procedures

In case of severe weather, move out of the greenhouse complex to a more stable building on campus to wait out the storm. If you are caught off guard and time is critical, go to the Fire station to the west of the Ashland Road Facility.

Smoking

Smoking is absolutely prohibited in all areas of the Ashland Road PGF. If you use tobacco, wash hands thoroughly before entering the facility to avoid bringing in viruses that may be contained in tobacco

Termination of Occupancy after Project Completion

It is the responsibility of the **greenhouse user** to properly dispose of the plant material in a timely manner after project completion. The module must be returned to its original state when a user terminates occupancy.

PESTICIDE POLICY

1. All pesticides are to be applied by trained greenhouse personnel only, not by greenhouse users. This includes soaps, oils, etc.
2. Everyone who works in the greenhouses or growth chambers is required to go through Worker Protection Training with Michelle Brooks. Michelle will also go over the pesticide procedures with you then. If you hire new people, make sure they contact Michelle to set up a time to do this training. It only takes about 30 minutes at the most.
3. It is up to you, the user, to keep an eye on your plants and submit a pesticide application request in writing to Michelle when you notice a problem. The best way to do that is to email "Brooks, Michelle A." <BrooksM@missouri.edu> with your request and the specific location you are requesting treatment for. Once Michelle receives a request, her crew scouts the room to confirm which specific pests are present and she will schedule the initial application. Michelle does her best to get the room treated as soon as

possible but depending on when she receives your request and the severity of the problems in all the rooms she receives requests for, it may not be sprayed immediately. For example, if you turn in a request at 3:00 on Tuesday it will probably not get treated until Thursday. Pesticides are only sprayed on Tuesday and Thursday evenings after 4:30 pm so that you have time to get your work done during the day and the greenhouse will only be locked overnight. Warning signs will be posted on the door for the restricted entry interval during which time, the room will be locked. In the morning, they take down the signs and unlock the door. The green sign stating when and what was sprayed will be posted in the hallway for 30 days so you can go back and look to see what was done in your room. Beyond 30 days, you need to contact Michelle for that information.

4. After the initial application, they continue to scout the room and do follow-up treatments as needed. As required by most pesticide labels, spray intervals are at a minimum 7-10 days apart.
5. If you are taking data or something that you have to have access to your greenhouse on certain Tuesday or Thursday evenings, you need to let Michelle know so she knows they can't spray those evenings. If for some reason there are plants that you do not want sprayed, you need to let Michelle know that too, however, keep in mind that if the entire room is infested, she cannot get control of the pest if there are infested plants that she can't spray.
6. Spray requests are good for 30 days. Usually in that time, with 1-3 sprays, she can get the pest population under control. And they will continue to scout and monitor that room for those 30 days. If another problem comes up a couple months later, you have to submit a new request.
7. Keep in mind that you should submit a request when you first notice a problem. If the plants are severely infested, it is much harder to control plus the chances are much greater that the pest can spread to neighboring rooms. On the other hand, if you see one thrips and turn in a request, if Michelle can't find the thrips when she scouts, the room will not be sprayed. Most of her pesticides are contact pesticides so it doesn't do any good to spray if the pest is not actually there. Michelle will scout the room for the next couple of weeks and if she finds thrips she will begin treatments. There are also lots of restrictions on how many times per year that Michelle can spray certain pesticides so she has to be careful to make sure the pest problem is there before she can spray.
8. Those of you who work in both growth chambers and greenhouses should always go to the growth chambers before you go to the greenhouses and never move plants from the greenhouse to the growth chamber room. It's very easy to carry pests on plants or yourself from the greenhouses to the chambers. Michelle also recommends that you do not wear yellow clothing in greenhouses. Whiteflies are very attracted to yellow clothes and will land on you and be moved from one place to another.
9. Michelle's crew can only apply pesticides in the greenhouses and in the growth chambers at the greenhouse facility. Any growth chambers located in labs in other buildings are the responsibility of the lab personnel.

10. Cleanliness in your greenhouse can help to keep pest populations under control. Any build-up of media or plant debris on benches or on the floor are places that harbor pests. Stacks of pots being stored in the greenhouse can harbor pests. There are brooms in the hallway and Michelle has a shop vac and power washer that can be checked out for use by emailing Michelle or Rich Wilman "Wilman, Richard" <wilmanri@missouri.edu>. If there is any time that a growth chamber or greenhouse can be emptied out and thoroughly cleaned it will help.

11. Please also keep in mind that when Michelle's crew sprays a greenhouse or growth chamber, complete eradication is nearly impossible. There are just no pesticides that are relatively safe for people to handle that completely kill everything. Because most of them are contact sprays it's just very hard to hit every tiny pest so they do the best they can to kill as many as possible.