

Agriculture and Bioresources

Phytotron Information

UofS.Phytotron@usask.ca

Welcome to the Phytotron

A Phytotron is a laboratory for growing plants under various combinations of closely controlled environmental conditions. This Phytotron at the College of Agriculture and Bioresources has over 180 environmentally controlled chambers ranging from small reach in units to larger 178 sq ft units ranging in temperatures from 45 C to -40 C with a tolerance of +/- .5°C as well as newly added Ultralow -80 freezers. The Phytotron operates as a cost recovery facility and bills users rental fees for environmental chambers and freezers. The UofS Phytotron has a range of equipment and work areas for use, also supplies for purchase (using a UofS account for billing).

Facility Access

The Phytotron is located on the main floor of the UofS Agriculture Building. It is a secure facility and issues access cards (FOBs) as needed for people who are using the chambers or equipment in the facility. If you require access to the facility email or have your supervisor email UofS.Phytotron@usask.ca providing your name and reason for access, as well as your NSID.

The Facility is open 24/7, access to the Phytotron is only limited during the pesticide application time on Wednesdays from 2:30 pm to 4:30 pm. The Key card system will stop working at 2:00pm and you must be out of the facility by 2:30 pm. Refer to the pesticide application section for additional information.

Anyone you bring into the Facility is under your supervision until they leave the Facility. Be aware of floor gratings (trip hazards), large electrical equipment, chemical storage, mechanical systems and equipment.

House Keeping

Watering

There are many garden hoses located in some chambers and around the Facility. When you are done using a garden hose it is important that you shut the water off using the tap on the wall or chamber rather than the garden hose handle. Hoses left under pressure can and have burst or come apart and flooded the Facility.

- Pro Tips
 - It is much easier to wrap up the hoses if you close the valve and drain the hose first.
 - Wrap the hose on the reel in large circles rather than tight smaller ones.

Disposing of Material

It is the responsibility of the user to make sure that the areas and equipment they were using is cleaned up (disinfected when necessary). Please discard all plant material through the loading dock area 1C62 in the red garbage dumpster. There are numerous green bins and push carts around the Facility to transport plant material to the dumpster. You do not need to bag the material, and are welcome to take the carts outside and empty pots directly into the dumpster.

Any plant material containing suspected disease or insects should be disposed of immediately in the garbage dumpster outside 1C62. Plant material left inside the Facility and garbage cans is a source for pests and disease which will transfer to other occupants and into their chambers.

There are brooms, brushes, dustpans, squeegees, around the facility. There are also extra garbage bags, and shop vacs located in room 1C64, which is usually open or can be upon request with the Phytotron staff.

- Note that the shop vacs are labeled Wet and Dry and should not be used interchangeably.

Pot Filling

Pot filling should be done in room 1C72 to limit the spread of potting media. When working in this room is highly recommended to wear a lab coat or coveralls to help prevent the transfer of media around and outside of the facility. There will be a few common use lab coats for use in the potting room. If you require a personal lab coat or coveralls for this area your supervisor will need to provide that for you and it will be your responsibility to maintain and store the lab coat or coveralls.

It is also highly recommended that lab coats be worn in room 1C84.

Pot Washing

The pot washing area at the west end of the facility 1C86 has racks for drying pots. Please label your items to avoid confusion or possible mistakes between groups. This is a shared space so pots and equipment should not be left in this area for longer than it takes to get your chamber cleaned, roughly 1 week.

The large stainless steel sink in room 1C72 and the pot washing area 1C86 have soil traps installed on their drains. These soil traps will plug up very fast and stop the sinks from draining if soil is washed down the drains. To limit soil from being washed down the drain please remove as much soil as you can into the dumpster outside room 1C62 or a garbage can. It is also a good idea, and recommended when root washing, to use a strainer in a bucket to catch soil before it gets washed down the drain. If the sinks are plugged and not draining, please bring it to the attention of Phytotron staff so they can arrange to have the traps cleaned.

Drying Room

When using the drying room in 1C86 label your bags and use the log sheet provided. This will help keep things organized if the room becomes very full or if items are forgotten.

If you are finished using or would like your chamber cleaned (washed and baked) please remove as much plant material as possible. The Phytotron staff will vacuum and wash the chamber, refer to chamber cleaning for more information.

Getting a chamber

The Phytotron is a cost recovery facility and space in the facility is usually limited by the high demand for classes, student projects, and research. The Phytotron chambers are allotted biased on the following priorities, then a first come first serve basis.

1. Teaching purposes (class/lab)
2. Undergraduate student projects
3. Graduate student projects
4. Other types of research and breeding use by faculty members

If you require a chamber, you will need to fill out a chamber reservation form. Chambers must be tied to a faculty member, they will need to sign off on your reservation form. It is important you specify the intended use of the chamber to be able to take advantage of the level of priority above. The Phytotron will keep a waiting list of renters and the specific chambers they would be willing to use. As chambers become available potential renters on the list will be notified in the above order.

If you are unsure which chamber you need enquire with Phytotron staff for assistance.

Chamber Request Form can be found here, or the Phytotron USask website.

<https://agbio.usask.ca/documents/centres-and-facilities/Chamber%20Reservation%20Form.pdf>

PNTs Plants with Novel Trates

Will you be working with any controlled or modified plants, diseases, insects (GMO, Club Root, invasive species?) If so you must inform the Phytotron staff and biosafety@usask.ca

Chamber Settings

All chamber program conditions should be sent to UofS.Phytotron@usask.ca

Chamber Program Change Form can be found here below, or the Phytotron USask website.

<https://agbio.usask.ca/documents/centres-and-facilities/phytotron-program-change-form.pdf>

If you would like to see the conditions of your chamber, simply open the plexie glass door and touch the controller screen to wake it up.

Chamber Sensors

White chambers have the temperature and light sensor in the movable box. This box should be located close to your plants. Moving the box under a bench or on top of the warm lights will affect the operation of the chamber and cause unusual control of the chamber.

Green chambers use an air sampling tube which sticks up through the floor. Be careful not to fill this tube with water or the sensor will not be able to take an air sample from the chamber. These chambers also have an adjustable light sensor on the wall, feel free to move this close to your plants and see the reading on the chamber controller.

Chamber Cleaning

The Phytotron staff will clean and bake chambers before they are rented. Having your chamber cleaned and baked is a free service the Phytotron offers. If you would like your chamber cleaned and baked remove most of the plant material and equipment and inform the Phytotron staff using the email UofS.Phytotron@usask.ca The Phytotron staff will vacuum, wash and bake the chamber at 35°C for 3 days. This typically takes about 1 week to get the chamber

operational again, but it is the best way to start a new growth cycle without an established pest population or plant disease present.

Pesticide Application

Pesticide application is to be performed by Phytotron staff only. Chamber ventilation is recycled into the underground parkade and will carry any pesticides and chemicals through the ventilation into the building. During the Wednesday pesticide application, the fans are switched to exhaust to the outdoors.

Wednesdays are pesticide application day, and the Phytotron staff apply pesticide from 2:30pm to 4:30pm. There will be signage posted on all the entrance doors and the key fob system will stop working from 2pm until 4:30pm. Please leave the facility by 2:30pm and only return after 4:30pm. Any chambers that have been sprayed will have signage posted on the door, keep out of these chambers until the next day when the signs are taken down and it is safe to enter.

Pesticide applications are done by request only, it is a free service. If needed, inquire about any possible pests or diseases and the Phytotron staff can assist you in coming up with possible solutions. The most common pests and diseases found at the Phytotron are powdery mildew, thrips, fungus gnats, aphids.

Biologicals

Most occupants have found biologicals the best way to manage fungus gnats and thrips. Some insecticides are contact based and are leading to resistance, they are not always effective. Most chambers will experience some level of fungus gnats and thrips, preventative measures are still your best defense - sticky traps, biologicals, and proper cross contamination procedures (entering other facilities or chambers with pests, then bringing them on your clothing and equipment to your “clean” chamber) Sticky traps are available upon request for free.

Aphids

Aphids can take over an entire chamber in very little time. Properly disposing of plant material outside is always the best option to keep pests away but this is especially important with aphids. **If you have any material with aphids, please dispose of this directly in the garbage dumpster outside room 1C62 and inform Phytotron staff that your chamber has aphids,** Phytotron staff can help keep the pests more contained, and hopefully eliminated with a systemic insecticide. The systemic insecticide can be applied any day even if it is not the pesticide application day because it is a soil drench and is absorbed up the roots of the plant. The systemic is usually good for the entire life of the plant.

Available Equipment

There are multiple types of equipment for use in the facility, most items are locked out for safety and will require a key obtained from the Phytotron staff. Refer to each piece of equipment's SOP for proper use and safety information. If you would like more information, a refresher, or help setting up the equipment ask the Phytotron staff for assistance.

Soil mixer - Located in 1C66

Dehuller - Located in 1D80

Single head thresher - Located in 1D80

Almaco blower - Located in 1D80

Drying room (approx. 45°C) - Located in 1C86

Pesticide spray cabinet - Located in 1D76

Potter Spray Tower - Located in 1D76

Rooms and Booking System

The Phytotron has shared work areas for pot washing, potting, plant processing, etc. During Covid a room booking system was implemented to limit the amount of contact people would have with each other. Due to the success of the booking system to help organize areas that might have otherwise become congested, it will continue with some modifications. Most of the bookable areas that were limited to one person have been expanded to accommodate multiple bookings. The booking system is a tool meant to help people with time restraints and planning. It is ok to use empty space without booking but be aware that others who made bookings should have priority over the equipment and the space.

The following link leads to the room booking page. For additional information refer to the room booking pdf.

<https://outlook.office365.com/owa/calendar/AgBioPhytotron@usaskca1.onmicrosoft.com/bookings/>



Phytotron Common
Workrooms Booking

Material Requests

The Phytotron carries a variety of supplies for sale that can be charged to your chamber or a UofS account. We do not accept other payments for supplies.

If you would like to email a request for us to leave supplies at a chamber or in a potting room, use the UofS.Phytotron@usask.ca email. You can also pick it up in person during normal working hours (8-12 1-430) by stopping at the main office 1C61 or locating Phytotron staff around the facility if we are not at the office.

Supplies include but are not limited to the following, other items can be brought in upon request with enough notice.

-Silica sand, topsoil – (upon request)

Promix (FPX, HP, BX) pots of various sizes, trays, bamboo, slow release and water-soluble fertilizer, coffee filters for inside pots, tapener, tapener tape and staples, vermiculite, perlite, tags, envelopes, sticky traps

Facility Contact Information and Notifications

When you need to contact the Phytotron staff it is best to use the email UofS.Phytotron@usask.ca this email goes to all Phytotron staff and will insure that if one of them is away or busy the other person can respond to your email.

If you would like to be added to the Phytotron email list to be informed of any shutdowns, emergencies, or related facility issues then email the UofS.Phytotron@usask.ca indicating that you would like to be added or removed from our mailing list. Primarily this mailing list should be used only to communicate any issues that pertain to the entire facility, informing most users all at once.