

POLICY AND GUIDELINES FOR THE USE OF ECOLOGY & EVOLUTIONARY BIOLOGY GREENHOUSES



Ecology and Evolutionary Biology

UNIVERSITY OF COLORADO **BOULDER**

This new policy consolidates and updates all previous guidelines and policies regarding the use of EBIO greenhouses. This document is approved by the Department Chairperson and the EBIO Greenhouse Committee. Although some of the information contained in this document may not pertain to any one user, it is important that all users be familiar with the normal operations and policies of the greenhouses.

This document is also available online at:
<http://www.colorado.edu/ebio/greenhouseguidelines.pdf>

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SAFETY INFORMATION & INTRODUCTION

Important Phone Numbers

Emergency	911
Campus Police (non-emergency)	303-492-6666 or 2-6666
Service Desk (Operations Control Ctr.)	303-492-5522
Malinda Barberio (Greenhouse Manager)	517-282-3048 (cell)
Tom Lemieux (Asst. Greenhouse Mgr)	303-520-4314 (cell)
Janice Harvey (Asst. Greenhouse Mgr)	303-903-6477 (cell)
30 th St greenhouse	303-492-3387
Greenhouse Manager Email	ebiogreenhouse@colorado.edu

Emergency Procedures

For any emergency requiring campus police, dial 911. If you call 911 for a medical emergency, remember that the doors to the greenhouse are typically locked and may need to be propped open for some emergency personnel. Fire and CU Police should have a key, but be prepared to help on their arrival.

Vandalism

Aside from a medical emergency, the most likely reason to call 911 would be if you witness vandalism taking place. Consider your own personal safety first. In some cases, it may be best for you to leave the premises and then call 911 to report the vandalism.

If you are the first to discover vandalism that has taken place at any greenhouse, please call campus police at 303-492-6666. If safe, wait until they send an officer to take a report. They are usually prompt. Also contact greenhouse manager Malinda Barberio, or assistant managers, Tom Lemieux 303-520-4314, and Janice Harvey 303-903-6477.

For any emergency requiring service personnel, such as a broken water main, no water, no electricity, no heat, no coolers functioning, broken glass overhead, etc. call the Service Desk (Operations Control Center) at (303) 492-5522 and explain the nature of the problem. Tell the service desk that it is an emergency situation and requires immediate attention. Wait or check back periodically to be sure that Facilities Management personnel are attending to the situation. Also call the greenhouse manager or assistant managers (numbers above).

SAFETY

30th street

- **Fire extinguishers:** There are two fire extinguishers in the headhouse. One behind the handwashing station to the left of the front door. And one on the side wall near the side door by the manager desks.
- **First aid:** located under the second fire extinguisher by the side door on the wall
- **Eyewash station:** located on the wall by the entry to the greenhouses from the headhouse
- **Material Data Safety Sheets:** located on the wall above the eyewash station near the entry to the greenhouses
- **Handwashing Station:** Located to the left of the front door. Sink with soap and paper towels. Anyone entering the greenhouses must wash their hands.
- Yellow and Black reflective tape on the floor of the headhouse surrounds important control panels and indicates not to place any objects within those boundaries

Macky

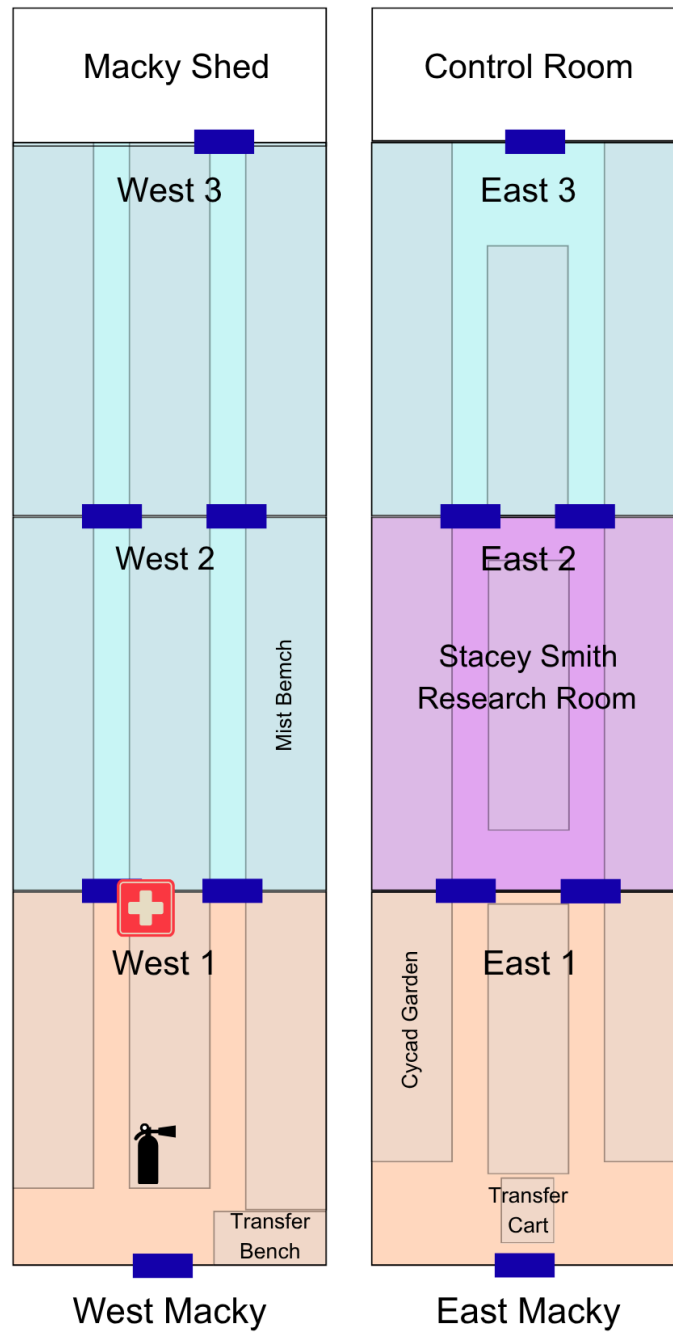
- **First Aid:** located on the center bench in west 1
- **Fire Extinguisher:** Located on the bench next to first aid on the center bench in west 1.
- **Material data safety sheets:** Located in East 1 on the wall

Ramaley

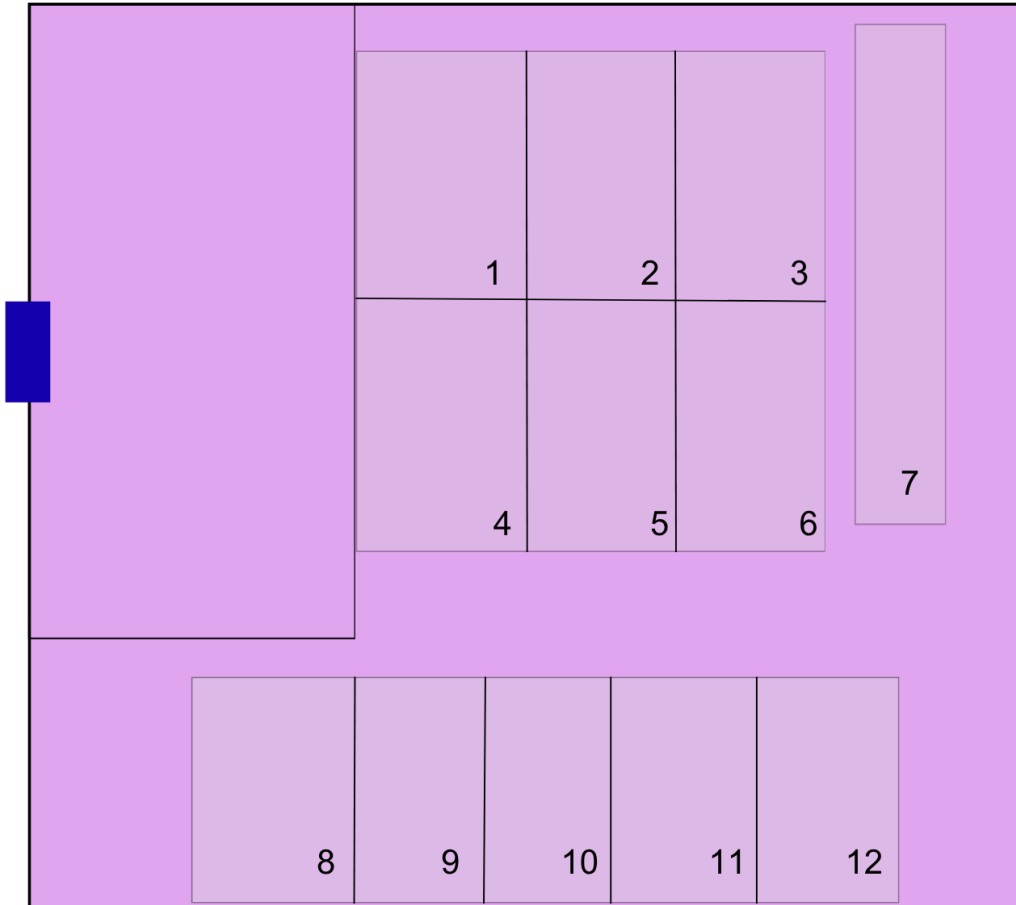
- All safety, first aid, sink, and pesticide information is located in the Ramaley headhouse before entering the greenhouse.

Maps

Macky Greenhouse



Ramaley Greenhouse



Key



Research



Tropical



Misc.



Alpine

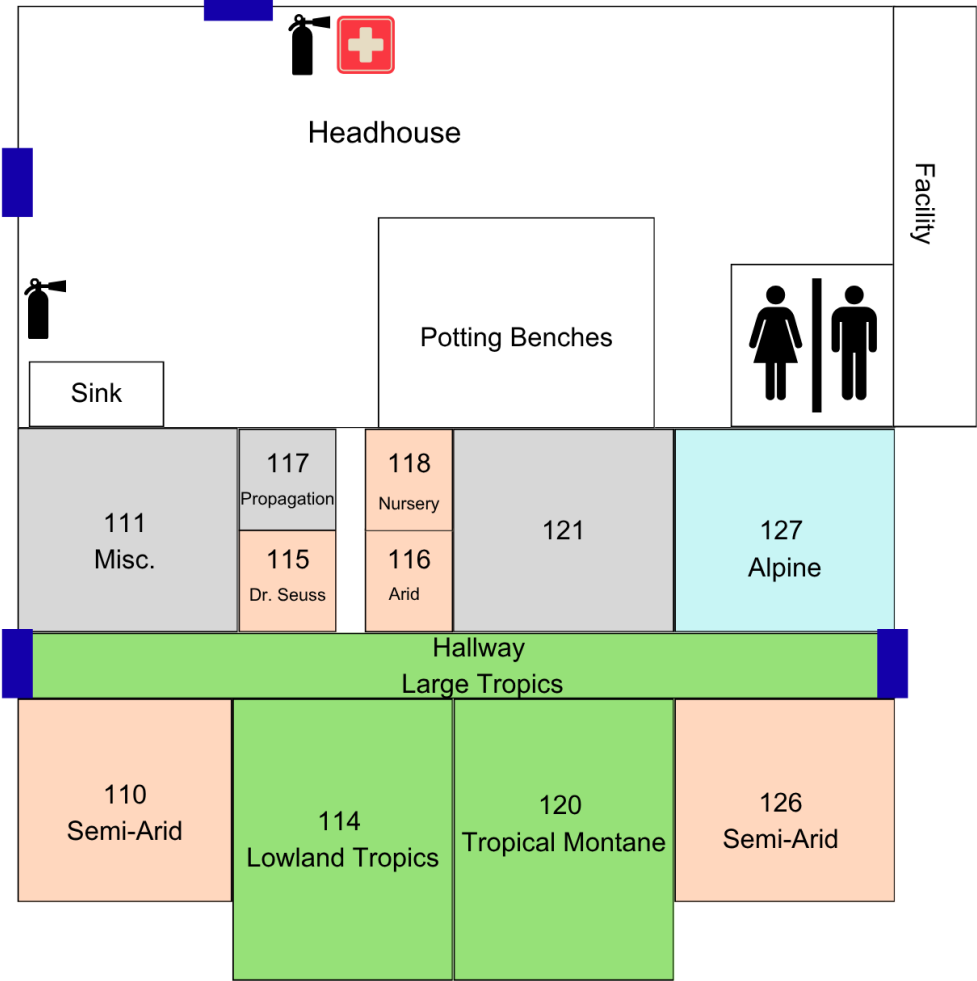


Arid



Door

30th Street Greenhouse



GENERAL INFORMATION

Facilities

The Department of Ecology and Evolutionary Biology at the University of Colorado maintains three greenhouse facilities for faculty, researchers and students:

- **30th Street:** a ground level, compartmentalized facility at 1380 30th Street on East Campus (30th street). This facility is easily reached along the Boulder Creek bike path and is only a 10-minute ride from Central Campus. Directions and maps available at the EBIO Greenhouse website:
<https://www.colorado.edu/lab/greenhouse/>
- **Macky:** Two ground-level, separate greenhouses at the northeast corner of Macky Auditorium
- **Ramaley:** a single-room, rooftop facility on the fourth floor of Ramaley

Parking and bike racks

- **30th Street Greenhouse:** Lot 515 requires a valid parking permit for either lot 515 (30th St. Greenhouse) or any central campus lot, and is enforced 7AM to 7PM, 7 days a week. Parking is not monitored evenings and weekends. One accessible parking space is available. A bike rack is mounted on the concrete pad at the loading dock.
- **Macky:** No vehicle or bicycle parking specifically for greenhouse users. 30-minute parking available in front of the greenhouse for loading and unloading. Use regular lots and bike racks near the library or elsewhere.
- **Ramaley:** same as Macky, but without the loading zone.

Restrooms

There is a restroom towards the back of the headhouse at the 30th Street facility. Neither of the other two greenhouses has a dedicated restroom.

Securing Facilities

- **30th St:** the door to the headhouse (brick building) locks when closed, but sometimes does not fully close on its own in winter. Please pull it closed. It is preferred that users leave only through this door at 30th St. Hallway doors will

not latch, and sometimes do not completely close. Please do not leave the 30th St facility through the hallway doors. If you use a hallway door, please be sure it is fully locked from the inside before you leave.

- **Macky:** The doors must be locked with a key when leaving. The doors will not lock automatically.
- **Ramaley:** The door is always locked.

Teaching Collection

The EBIO Plant Teaching Collection is a large assemblage of plants from around the world. It contains over 1000 species in about 150 families. Most plant science courses, as well as a few others within the Department, make use of this collection. In many cases the plants are not replaceable, as they have been acquired from collectors here and in foreign countries, from specialty growers who may no longer be in business, or even from scarce sources available only at an earlier date. Increasingly, our collection contains rare and endangered plants. Please help us preserve the collection by reading and observing all of the greenhouse protocols.

USAGE POLICIES & USER RESPONSIBILITIES

Usage

Greenhouses

- **30th St. Greenhouse:** Used for research purposes as well as housing part of the teaching collection. Rooms 114 and 120 generally do not have space for research projects (unless they occupy a small amount of space).
- **Macky Greenhouses:** Used mainly for housing part of the teaching collection, especially those plants loaned for laboratory use. Some research or undergraduate experiments may be conducted here when space is available.
- **Ramaley Greenhouse:** Used primarily for active research purposes: plants maintained in the Ramaley greenhouse are generally used at regular intervals for research. This greenhouse is ideal for experiments or plants where regular sampling is required. Additionally, this greenhouse may be used periodically for some student experiments, space permitting.

The greenhouses are Department facilities and do not necessarily exclude use by animal biologists or microbiologists. However, use of the greenhouses for animal studies will be considered on a case-by-case basis as well as other committees that regulate animal experiments (e.g. Institutional Animal Care & Use Committee (IACUC)). Activities and protocols required for the cultivation of genetically engineered organisms are the sole responsibility of the researcher and must be in compliance with any regulations established by the USDA, EPA, NIH, DEA or any other agency having federal, state, county or local jurisdiction, as well as any requirements established by the University.

User Type

Formal or large-scale users of the greenhouses: All of the policies and guidelines for the greenhouses relate to this kind of usage, with the exception of special policies pertaining to Emeritus Faculty Usage or Incidental Usage (see below).

Emeritus: While the continued service of Emeritus faculty to the EBIO Department is valued, privileges do not include automatic continued use of departmental greenhouse space. If an emeritus faculty member wishes to conduct research in Department greenhouse facilities, the retired faculty member should submit an Application for Research Space in EBIO Greenhouses (available from the greenhouse website, under Resources) to the Greenhouse Manager. The request will be considered in the context of space availability at that point in time. New research projects for Department faculty may take priority if space is limited. Collections of plants for which research is not actively on-going or which may not be useful in teaching cannot be maintained after the official retirement date of emeritus faculty. If plants or other supplies remain in the space after the emeritus faculty member retires, they become available for use by the new instructor(s) and/or the greenhouse manager. In all cases, emeritus faculty must abide by the *responsibilities of all users*.

Incidental usage of greenhouse space: The greenhouse manager is responsible for providing space to students and faculty within EBIO for legitimate research projects. No other use is authorized. Use of space by non-EBIO personnel requires the same responsibilities and usage fees as for EBIO personnel. Special usage (i.e. usage other than for teaching and research) by EBIO or non-EBIO personnel may require the approval and/or arrangement at the discretion of the greenhouse manager. The benefit to the Department must be demonstrable by the greenhouse manager to the Greenhouse Committee. In all cases, incidental users of space must abide by the *responsibilities of all users*.

Expendable Materials

If researchers need bagged soil from a supplier (i.e. unused), they will need to purchase it, label it and keep track of it. Soil purchased from the greenhouse budget is used for the teaching collection *only*.

The greenhouse budget provides for pots (if available in our stock). See the greenhouse manager for information regarding local suppliers.

Environmental Controls

Individual users are responsible for ensuring that special treatments, such as supplemental lighting, do not interfere with other research projects. This control might require the construction of special curtains. Except by consent of the Greenhouse Manager, single greenhouses, such as Ramaley, are maintained under natural day length with an established day and night temperature. Individual rooms at 30th Street offer different environments based on request from the first user, the major user or by agreement. Please do not attempt to modify any greenhouse controls. See the greenhouse manager or greenhouse assistant manager if you desire changes in the environment.

Prohibited Activities

1. Do not use brooms and dustpans that are designated for potting benches on any floors at any time. This is extremely important to avoid contamination. At 30th St, the brooms for benches are either on the potting bench or attached to the legs of the bench.
2. The greenhouses are not a suitable site for children (15 and under) unless they are supervised at all times. Some plants have stout spines at eye level. Contact the greenhouse manager for permission and the Child Safety and Conduct Policy.
3. Use of any tobacco products is prohibited at all times within all greenhouse facilities because of the threat of tobacco mosaic virus (TMV). Because TMV is mainly transmitted by mechanical means (i.e. people), please also read “Pruning and/or harvesting plant parts” on page 13.
4. The greenhouses are a University facility and must abide by all University rules and regulations, including regulations regarding the use of alcohol.
5. No skateboards or rollerblades are permitted in the greenhouses.

Space Allocation

New users of any EBIO greenhouses should consult first with the greenhouse manager through email at ebiogreenhouse@colorado.edu. Unless prior arrangements are made, an “Application for Research Space” should be approved before any plants are placed in any greenhouses. This application can be found under <https://www.colorado.edu/lab/greenhouse/applications-and-policies>. After the application is received, all new projects will require a brief meeting with the greenhouse manager before final approval is granted. Plants found in the greenhouse without the required approval will be discarded.

Space utilization is coordinated through the greenhouse manager and is made available on a first-come, first-served basis.

Charges

Researchers are charged usage fees for ANY SPACE OCCUPIED, regardless of whether the plants are on a bench or on the floor. The usage fees paid by researchers are necessary to contribute to needed maintenance, repairs of equipment and supplies such as hoses, fertilizer, insecticide, etc. In addition to usage fees, researchers are expected to pay for potting soil and soil amendments (these are NOT included in usage fees). Fees are subject to change.

If the greenhouse has unused containers available in sufficient supply for a researcher’s needs, the researcher may use such containers at no charge (on a first come, first-served basis). However, in general, researchers should expect to furnish their own supplies.

Current bench fee rates are:

Faculty, Staff, Students \$ 8.00 / sq. ft. / year

Minimum Charge \$ 100 / billing cycle (twice yearly)

Access

All faculty have access to 30th St through their Buff One card. New faculty members will need to be added so contact the department liaison. For Ramaley and Macky, students and others should contact the department key liaison to request physical keys. If you or a student helper has or has had more than one buff one card, this must be resolved with the Buff One office before access to the 30th greenhouse can be granted (requirement of Access Services office).

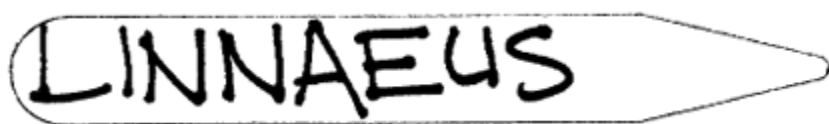
Please use your keys/buff one card wisely. Do not lend them to anyone, unless it is a legitimate emergency. Do not leave your keys in the greenhouses or

greenhouse doors. Keep them with you at all times that you are working in the greenhouse. At times, users of the greenhouse have been locked out of the greenhouse by leaving their keys in purses, backpacks or on benches.

Labeling of Plants

Label all plants, flats or groups of plants in a conspicuous manner with the name of the researcher as indicated below. Plants not identified to a researcher will be discarded.

Researchers will be asked to fill out a [research bench tag](https://www.colorado.edu/lab/greenhouse/applications-and-policies) that is a posted sign indicating their project, emergency contact information, and study species. This bench tag can be found <https://www.colorado.edu/lab/greenhouse/applications-and-policies>



Please refrain from removing any labels in the teaching collection. We have plants of the same species with different accession numbers which may be adjacent to each other on the bench. They were collected in different localities. Plants are rendered less useful when collection data is lost or misrepresented.

CARE OF PLANTS & FACILITY

Responsibilities of All Users

1. No plants should be introduced into the greenhouse environments without the knowledge of the greenhouse manager. The designated amount and location of space must be strictly followed and the maximum amount of space for any one incidental user is 55 ft², regardless of where the plants are located.
2. The user must water his/her own plants.
3. The user's plants must be kept insect, disease and weed free at all times. Failure to comply will result in immediate removal of plants. The greenhouse staff is not responsible for infections or infestations of plants belonging to incidental users of space.
4. The user must accept the possibility that s/he will have to vacate the greenhouse, the room or the space on short notice.

5. All counters, floors and work areas should be cleaned immediately after use. Do not store items on the limited counter space or potting benches. For the Ramaley greenhouse, plastic trash bags are on the shelf of the wall opposite the sink. Please be sure plastic trash bags are not too heavy, as janitors will not dispose of excessively heavy bags. Keep in mind that janitors clean only the bathroom of the 30th St.
6. Pots overfilled with water or soil tend to leave soil on the greenhouse floor, which clogs the floor drain. Please clean up any mess resulting from such practices.
7. Please dispose of any dead or dying plants in a timely manner. Dead and dying plants often attract pests that then migrate to other plants in the greenhouse.
8. If a user coordinates for a substitute person to water his/her research plants during a period of absence, it is the responsibility of the researcher to ensure that the substitute has carefully read all greenhouse policies contained here. The greenhouse manager should be notified of any such substitutes.
9. Remember to lock the doors of any facility that you use. Campus police have found our greenhouse doors unlocked at various times of night.
10. We are dependent on University Police for security checking and to help with vandalism issues. If you are asked by University Police to identify yourself, please cooperate fully so that we can continue to receive the security and attention that vulnerable greenhouses require.
11. All users of the greenhouses who make use of our propane torches are required to receive a demonstration from the greenhouse manager or assistant manager.

Plants & Facilities

The plants in the teaching collection are watered, fertilized, potted and transplanted by the greenhouse staff. Researchers or their work-study students must water, fertilize, prune and otherwise care for their own research plants. Facilities Management, with the help of greenhouse staff maintains pest control (for research plants and the teaching collection), Greenhouse staff maintain fertilizer solutions, equipment and general aspects of the facilities. Incidental users must maintain pest control on their plants.

Viruses are a constant threat to any collection of plants. Thorough hand-washing with soap BEFORE working in the greenhouses is a required practice for all greenhouse visitors. If you are a tobacco user or if you have hand-to-hand contact with a tobacco user this recommendation should be construed as a requirement. This procedure will minimize the threat of transmitting

Tobacco Mosaic Virus (TMV). In addition, some of our plants are known to have viruses (other than TMV), but they are too valuable to discard. The greenhouse policy is that NO plants will be cut or harvested unless the pruning shears, knife or cutting implement is sterilized with a propane torch. Please help us keep our collection free of viruses by following this necessary protocol. If you do not know where to find or how to operate the propane torch, see the greenhouse manager or assistant managers.

Boulder County inmates usually work at the greenhouse once per month, washing pots, cleaning floors, weeding and doing other kinds of clean-up. We are asked not to engage them in conversations that relate to their personal lives or their reasons for being in jail. If you have questions about this arrangement, please address them to the greenhouse manager.

On occasion, the greenhouse manager may give away plants to employees, staff, students or the general public. It is a violation of University and EBIO policies to sell any plants that have been given away to individuals or classes. In addition, the greenhouse manager and EBIO reserve the right to have dumped plants remain in the trash and not be scavenged by interested individuals.

Borrowing Plants

All plants are available for use in teaching purposes. Permission to use material must be obtained from the greenhouse manager prior to use because some plants require special care. These special plants are to be used only within specific guidelines due to their small biomass, rarity in the wild, requirements for particular environmental regimes, etc.

Borrowed plants are coordinated through the greenhouse manager or assistant managers but the plant lab coordinator may also be able to help. If you borrow plants for use in a course, please be sure that they are cared for while away from the greenhouse and that you return them in a timely manner. Usually this is done by the lab coordinator but the ultimate responsibility is with the borrower.

It is vital that the borrowed plants be well cared for while on loan. This means providing water when needed. If you are unfamiliar with the care of plants, please inform the greenhouse manager or assistant managers.

Fertilizer Injection

1. All EBIO greenhouses have fertilizer injection systems with complete fertilizer, and they are available for all to use. There are, however, idiosyncrasies with each. Please see the greenhouse manager for assistance. The fertilizer in the concentrate tanks is typically ~ 100X. Do not use the concentrate straight from the tank! It must be diluted by passing through the injector or by mixing with water. We occasionally have problems with people

opening or closing valves associated with the injectors or back-flow prevention devices. Please do not operate any valves without the knowledge of the greenhouse manager. Quick couplers are on hose bibs for easy transfer from fertilizer to tap water and vice versa. Ask for a demonstration if you are unfamiliar with this equipment.

2. The fertilizer used is a complete fertilizer and is mixed at approximately 100 to 200 ppm of nitrogen. This allows for daily watering of most plants without incurring fertilizer burn. It is advisable to leach accumulated salts by watering periodically with tap water alone. Occasionally our fertilizer is sent for analysis and the current sheet is available from the greenhouse manager.
3. Special fertilizer concentrates are the responsibility of the individual user.

Insecticide Use

1. All new greenhouse users must receive the worker protection standard training on pesticide exposure as mandated by the EPA. This training must be coordinated with the greenhouse manager and completed prior to your first day in the greenhouse.
2. Any plants are likely to be sprayed with a pesticide on the scheduled day and time: The day and times vary twice per year. Check the greenhouse door for the current schedule. If you do not want plants treated, you must indicate which plants with a large, waterproof sign (at least 8" X 10") that reads "NO PESTICIDES," the name of the plants in question and your name, and you must inform the greenhouse manager. When the greenhouse is being treated or for the duration of the Re-entry Interval (REI), it is a violation of state and federal laws to enter the greenhouse. If any greenhouse users are consistently guilty of violating these entry rules, they will be reported to the Chair and a suspension of greenhouse privileges will be requested.
3. Please report any pest outbreaks promptly to the greenhouse manager.
4. It is a violation of state and federal regulations for anyone not certified to apply any kind of material labeled as a pesticide. This includes insecticidal soap, sulfur, oil or any other material that is labeled and sold for the purpose of controlling pests on plants. One of the exceptions is that dishwashing soap can be applied and is not regulated. Any purchase or storage of such pesticide-labeled materials by researchers, student helpers or any other users of the greenhouse will have to be reported to the Chair of the EBIO Department and may result in greenhouse privileges being revoked. We are under the scrutiny of the EPA along with state and federal departments of agriculture. Any compromise in this area leaves the Department and the University open to citations and fines. Please comply fully with this requirement.

5. Any user of the greenhouse who is certified as a Pesticide Applicator must inform the greenhouse manager who must in turn inform the Campus Integrated Pest Management Coordinator.

The campus greenhouses are regulated by campus pesticide use policy (<http://ehs.colorado.edu/Download/pest.pdf>). Campus policy requires that all pesticide use on campus be reviewed and approved in advance by the Campus Integrated Pest Management Coordinator. Campus policy also requires that pesticides only be applied by licensed pesticide applicators, or their approved assistants.

Pruning and/or harvesting of plants

Please be sure to read about viruses in the second paragraph under Care of Plants and Facility. The propane torch is used to sterilize cutting tools, and it is dangerous if not used properly. Take care that there are no plants, glass, people, etc. in the path of the flame before turning it on. You must get instructions from the greenhouse manager or assistant managers before you use the torch. Please do not prune any plants in the teaching collection unless specifically requested by the greenhouse manager or assistant managers.

Root washing and pot washing

1. **30th Street:** Do not use the west sink (near greenhouse entrance) for any soil-related activities. Washing of roots and other soil activities (washing pots) should be done outside with a hose.
2. **Macky:** Avoid using sinks in Macky for any soil-related activities.
3. **Ramaley:** The sink trap is clogged by washing soil from roots or pots. Please remove all soil from the plants before you use the sinks.
4. Dirty pots can be used “as is” by researchers or they can be cleaned by researcher’s staff and used free of charge. Usually pots will have been already cleaned by inmates.

Watering

The information pertaining to watering is covered under “Specific Information for Designated Users: Plant Caretakers and Staff” because most of it pertains to staff. If you will be using hoses or watering plants, please be sure to read this section.

Mist systems

Please do not turn off any mist or irrigation systems without the approval of the greenhouse manager, unless it involves an emergency.

Power Tools

The greenhouse has a limited amount of power tools and users should be aware that power tools are dangerous and are used at their own risk. **The greenhouse staff is neither qualified nor authorized to instruct anyone in the use of power tools. If needed, get help from a qualified instructor.**

VISITORS & CONDUCT

Visitors

In general, it is not advisable to bring visitors to the greenhouse. However, if you do want to show a friend or parent around, please be sure that any guests know to wash hands with soap before you enter the greenhouse and to leave pot labels in place. Visitors under 15 years of age must review the [EBIO Child Safety & Conduct Policy](#) before entering the space. Refer all requests for access to the greenhouses to the greenhouse manager ebiogreenhouse@colorado.edu

Field trips

We welcome field trips to our space for greenhouse. Tours are limited to 20 people at a time. Please contact the greenhouse manager to request a field trip. Visitors & their responsible adults under 15 years of age must review and sign the [EBIO Child Safety & Conduct Policy](#) before entering the space.

SPECIFIC INFORMATION FOR DESIGNATED USERS

Volunteers

We greatly appreciate volunteers who are accepted into the greenhouse as work schedules permit. Volunteer days currently occur every Wednesday from 10 am - 4 pm. Those who cannot work those days are requested to try again for a different semester. Volunteers should be familiar with the entire booklet of Greenhouse Policies and Guidelines because they may be asked to work in any capacity.

Although we accept most volunteers, it is important to realize that there is a lot of work to be accomplished. We encourage those who want to learn and want to help us accomplish our goals. Not all of the work done in greenhouses is plant work, nor is it all “fun” work. Those who wish to volunteer in order to increase their own collection of plants or gather plants for other purposes are **STRONGLY DISCOURAGED**. This kind of activity usually results in the volunteer being asked to discontinue service.

Tasks for Volunteers and/or Staff: If you are working as a volunteer (or even as a greenhouse staff member), and if you are not able to work on an assigned project because you need help or have questions, the following list of tasks are ones that often need checking or doing. Please learn from the greenhouse manager or assistant managers how these tasks are performed, and work on them anytime that your project is stalled for one reason or another.

Volunteer tasks

- Sweep floors
- Empty garbage cans from rooms and headhouse
- Distribute garbage cans to individual rooms and selected locations
- Put clean pots away
- Organize and consolidate clean flats, pots and other containers
- Organize and consolidate dirty pots
- Organize glassware and plastic beakers
- Fill soil bins (be sure to use the correct bag and do not bury the scoop)
- Check and tighten all quick couplers for hoses and nozzles
- Reread greenhouse guidelines
- Check with greenhouse staff to help with pest problems
- Take initiative!

Teaching Assistants

1. A collection of living organisms that does not receive adequate care is a collection that either does not thrive or does not exist for long. Every TA needs to take full responsibility for every plant they use. Ideally, all TAs in a given course should be concerned about the plants borrowed, regardless of which TA has responsibility on a given week.
2. Please read carefully and be familiar with the entire document on Greenhouse Policy and Guidelines. Smooth operation of the greenhouses depends on users' knowledge of protocols and policies. Especially important are the following sections: responsibilities, insecticide use in greenhouses, pruning and/or harvesting plant parts, and borrowing plants.

PLANT CARETAKERS & STAFF

If you are a greenhouse staff member, you should know that **very few** reasons are considered acceptable for not showing up to water. You must speak with another greenhouse staff member who is capable of watering in order to transfer the responsibility for a given day. Do not leave a message requesting another person to water for you. Phone numbers of all personnel are listed on the phone sheet near the telephones in both Macky and 30th St. greenhouses.

Environment:

Learn to “feel” the greenhouse environment of each room so that you recognize a problem when one exists (e.g. coolers not operating, vent stuck open or closed, heat not functioning or heat on at wrong time, etc.). Please check around the greenhouses; contact the greenhouse manager if something is out of place.

Cleaning:

After watering, the backbone of greenhouse work is cleaning. Please take care of at least one cleaning task each time you come in to water: empty trash in greenhouses; empty trash in headhouses and bathrooms (at 30th Street); sweep the floor of the greenhouse or headhouse.

Expectations:

Find out what you can do to make the greenhouses run smoothly. If you see something that needs to be fixed, contact the greenhouse manager. Learn what plants in our collection are valuable so you know where to concentrate your efforts when watering or giving care to the collection. Learn the kinds of work that are emergency related and learn how to deal with them so that you can act efficiently and appropriately in an emergency situation.

Watering

A guide and general introduction to watering will be provided to new student waterers by the greenhouse manager. Please request this document as you begin watering training.

Hoses:

1. Before you begin watering, unwind the hose and “snake” it out on the floor in the direction you are going to water. After watering, wind the hose with wide loops (fewest number) and with most of the loops resting on the floor. The hose should be untwisted.
2. Do not step on the hose. This weakens the hose and causes it to kink more easily.

3. Keep the nozzle off the floor at all times. This is a normal sanitation procedure to prevent contaminating the nozzle and therefore the plants with soil-borne pathogens such as *Pythium*, *Rhizoctonia* and *Phytophthora*. The last loops may have to be shorter or extended over the hose bib in order to keep the nozzle off the floor.

General Strategies:

1. Watering is the most important job in the greenhouse. It must be done free of distractions (no headphones , no radios) so that the person watering can concentrate 100% on the task. Watering always takes precedence over everything else, except an emergency. Watering of the collection is not a job assigned to volunteers.
2. There are many judgment calls when watering (e.g. “this plant doesn’t need water now, but it may need it before tomorrow morning”). What you choose to do should depend, to a large extent, on your understanding of the plant’s normal growing conditions (in the wild) and its condition in cultivation (large plant in a small pot?, porous soil mix? clay or plastic pot? recently cut back? current weather outside? expected weather for the day? etc.). Don’t assume that because a plant is wilting, that it needs to be watered more frequently. Plants can wilt due to overwatering or due to a physiological lag when suddenly exposed to full sun. Learn which plants have narrow tolerances.
3. Watering carefully takes time. If you start too late, you will be rushed and your decisions will reflect your poor planning. Even for those with experience, and depending on the prevailing weather conditions, watering (and checking plants) can be a three- to four-hour task.
4. Periodically, feel the temperature of the water to be sure it is not too hot or too cold. A number of factors can influence water temperature, including solar gain on copper pipes, malfunction of boilers, mixing valve adjustment, hot water pump switch, etc. Greenhouse staff should be familiar with all of these and should know how to make adjustments for the above situations.
5. Some plants have special requirements. Ask questions if you need information on specific plants.

**GREENHOUSE STAFF ARE REQUIRED TO READ THIS
BOOKLET REGULARLY UNTIL ALL OF THIS BECOMES AUTOMATIC**