

LABORATORY SAFETY PRACTICES

Department of Horticulture and Natural Resources

The Department of Horticulture and Natural Resources at Kansas State University is committed to providing a safe and healthy working environment for its students, staff, faculty, and the general public. To minimize the potential exposure to toxic and hazardous materials, the Department requires its students, staff, and faculty to adhere to all KSU laboratory safety policies and rules that govern the research and usage of specific hazards such as chemical, radioactive, and bio-hazardous materials. Specific laboratory safety rules (KSU LABORATORY SAFETY and the KSU RADIATION SAFETY MANUAL) can be found on the KSU Environmental Health and Safety website: <http://www.k-state.edu/safety/> and the K-State Research and Extension EHS at <http://www.ksre.ksu.edu/agsafe/>. Guidance documents with regard to field safety, lab safety, emergency response, and forms can be found at www.ksre.k-state.edu/agsafe/manuals_forms/.

The following safety practices are expected for all laboratories and workplaces. If you have questions concerning safety, direct them to your supervisor, a member of the Safety Committee, Safety Committee Chair (C.B. Rajashekar) at crajashe@ksu.edu, or the KSRE EHS office (Sandra Hoffman) at 785-770-2298.

IF YOU ARE NOT SURE OF THE PROPER WAY TO DO A JOB....ASK FIRST!!!

- 1. Job-Related Injuries, Incident Investigation and Reporting, and Emergency Response:**
KSU employees injured on the job should seek medical care as follows: **LIFE-THREATENING:** call 911 or report to the emergency room at Via Christi Hospital, 1823 College Avenue (telephone: 785-776-3322). **NON-LIFE THREATENING:** report to Via Christi Clinic and Via Christi Therapy Center, 315 S Seth Child Rd., (8:00 am – 5:00 pm Monday-Friday). Tell them that you are a K-State employee and all charges will be submitted to Worker's Compensation. If possible someone from the lab or the department should accompany you. Notify the departmental Human Resources personnel in the main office immediately or as soon as possible. You are required (within 3 days of the incident) to complete the Kansas State University Injury Report (<http://www.k.state.edu/safety/incident-reporting-form.html>) and the College of Agriculture Incident Report (www.k-state.edu/agsafe/accidents/indx.html). Once completed, return them to the HNR Human Resources person. All accidents involving personal injury, substantial damage to equipment, or a near miss that could have resulted in serious injury, should be reported to the Departmental Safety Chair. For investigation and reporting procedures, please check the K-State homepage (<http://www.ksre.ksu.edu/agsafe/>). For **EMERGENCY RESPONSE** to various situations (medical, fire, explosion, hazardous spills, terroristic threat, suspicious package), please visit www.k-state.edu/safety/emergency/index.html.

2. **Evacuation Procedures:** Each lab has an exit route posted and a designated assembly point outside the building. Once all personnel is accounted for, the lab supervisor should report to the HNR Safety Committee Member who will be located at a flagpole in front of the Military Science Building. For additional emergency information and evacuation protocols, please see Appendix II.
3. **Equipment Use:** Each lab is responsible for equipment/instruments/supplies in their lab. Do not use any piece of equipment until its operation has been explained and demonstrated. Additionally, if you want to use equipment or instruments or borrow supplies from other labs, you should check with the supervisor listed on the **Emergency Information Poster** posted in each lab. **DO NOT OPERATE ANY INSTRUMENTS OR EQUIPMENT UNTIL YOU HAVE PERMISSION FROM THE LAB SUPERVISOR.**
4. **Laboratory General Safety:** Lock your laboratory and greenhouse when it is unoccupied. Not only when you leave for the night, but also when you enjoy a coffee break or take lunch. For general lab safety guidelines and policies check www.ksre.k-state.edu/agsafe/manuals_forms/index.html and at this site, you can also find Laboratory Safety Manual.
5. **Laboratory Smoking Policy: SMOKING IS STRICTLY PROHIBITED IN ALL CAMPUS BUILDINGS.** Smoking near hazardous, toxic, radioactive, and flammable substances greatly increases the risk of fire and possible ingestion.
6. **Laboratory Safety for Non-Employees:** Unauthorized person(s) should not be allowed in laboratories that handle toxic chemicals, biohazardous materials, or radioactive materials. Authorized means having business in the laboratory with the permission of the principal researcher. It also means that such authorized persons must be provided the same kind of protection from toxic chemicals and hazards in the laboratory. Anyone under the age of eighteen (18) has to be under the immediate and direct supervision of a qualified authorized person at all times.
7. **Storage and Consumption of Food and Drink:** The separation of food and drink from laboratories can minimize the risk of contamination and/or accidental ingestion of chemicals. Never bring food, drink, or related utensils for storage, or consumption in to a laboratory. **DO NOT STORE FOOD OR DRINKS IN FREEZERS/REFRIGERATORS IN LABS.** Also, do not use microwave ovens for heating food in such laboratories. The HNR department has a refrigerator and microwave in locations on all three floors that can be used for food and drink.
8. **Personal Protection Equipment (PPE):** Exposure of skin or eyes to toxic and hazardous materials can cause serious health problems. The risk of exposure may also arise from spilled or splashed chemicals when inappropriate clothing (e.g. shorts and short skirts) or no protective gear is worn. Appropriate eye protection, such as splash goggles, face shields, or UV blocking glasses, must be available and worn if a risk of injury to the eyes exists.

Personal Protective Equipment (e.g. laboratory coats, goggles, and gloves) does not belong in public areas and should be stored properly in the laboratory.

9. **Safety and Emergency Equipment:** Safety and emergency equipment include fire extinguishers, first aid kits, emergency eye wash stations, emergency showers, spill kits, fire alarm pull stations, and emergency exits. Learn and know what to do in an emergency and where the necessary items are located. Get familiarized with these equipment (see www.ksre.k-state.edu/agsafe/manuals_forms/).
10. **Safe Handling and Storage of Chemicals and Solutions: NEVER PIPETTE OR SUCTION MATERIALS WITH YOUR MOUTH!** All chemical storage bottles should be labeled with content names, dates of acquisition/preparation, and any special safety/hazard notes. Chemicals should be stored in designated areas. For more information on chemical safety, please contact K-State Research and Extension Safety Director (Sandra Hoffman) at, or check the KSU Laboratory Safety Manual (<http://www.ksu.edu/safety/lab>). In addition, any equipment that is used for radioactive materials should be clearly labeled with a radiation warning sign(s) or label(s).
11. **Avoidance of Toxic and Hazardous Contamination:** Insertion or removal of contact lenses and any other manipulations, and application of cosmetic or lip balm in the laboratory could transfer hazardous material to your eyes or mouth and should be done outside the laboratory with clean hands. Laboratory coats and gloves may be contaminated with radioactive material, biohazardous agents, or chemicals and should not be worn in areas such as coffee areas, classrooms, and conference rooms. Generally, laboratory clothing should not be washed at home. If a washer dedicated to laboratory clothing is not available, laboratory clothing must be washed separately from general clothing. After a washer has been used for laboratory clothing, clean the washer by running it through one full cycle with no clothes in it, but with a full load of hot water and detergent. For cleaning personal clothing contaminated with pesticides, please check the KSU Agricultural Safety Manual or the K-State Research and Extension Home page (<http://www.ksre.ksu.edu/agsafe/>). Because wearing gloves is no guarantee that your hands are not contaminated, wash your hands before leaving the laboratory to minimize the risk of carrying radioactive, biological, or other hazards out of your work area into the other areas that should be clean and uncontaminated. Make certain that soap and towels are provided in your work area.
12. **Material Safety Data Sheets (MSDS):** When certain chemicals are purchased from a manufacturer or retailer, the company will send MSDS to the laboratory. Each research laboratory or program must keep a complete and current set of the MSDS and must make it available to all employees and students working in the laboratory.
13. **Chemical Spill Cart:** The department maintains an emergency spill cart in Throckmorton (TBD). If there is a spill (except for minor spills) call 911 or EHS. Do not leave a voice mail at EHS. For hazardous materials, call 785-532-5856 or email safety@kus.edu.

14. **Disposal of Chemicals and Hazardous Materials:** Do not discard broken glassware, used sharps (e.g. needles, syringes, scalpel blades, and razor blades), discharged batteries, florescent and High-Intensity Discharge (HID) lamps, and chemical wastes in the regular trash receptacles. Fluorescent and HID lamps contain 15-75 mg of mercury. This mercury could escape from the lamp if discarded in a sanitary landfill, leading to the contamination of the groundwater. The KSU Department of Environmental Health and Safety recycles all burned-out fluorescent and HID lamps, discharged batteries, and hazardous materials. **DO NOT DUMP HAZARDOUS CHEMICALS DOWN THE DRAIN!** For properly disposing of broken glassware, used batteries, burned-out lamps, and chemical waste, including **HAZARDOUS CHEMICALS**, please contact KSU Environment, Health and Safety Department for a pick-up. Please see Appendix I for details.
15. **Radiation Safety:** The faculty members for the research project(s) must obtain a license to use radioactive materials. They must apply to the Campus Radiation Safety Committee. The license will cover only the radioisotopes and quantities which have been approved. For more information, check the KSU Radiation Safety Manual (<http://www.k-state.edu/safety/lab/labsafety/topics/radiationSafety.html>) or contact the KSU Radiation Safety Officer(s) at 532-5856 at safety@ksu.edu. It is highly recommended that all students, laboratory technicians, research assistants and associates, and faculty members who are using or expecting to use radioactive materials in the near future participate in the three one-hour radiation safety training sessions at least once every three years.
16. **Biosafety:** The Institutional Biosafety Committee (IBC) and University Research Compliance Office (URCO) have developed online training modules for personnel conducting research using infectious agents or recombinant DNA (rDNA) at KSU. Please visit the Biosafety Research Institute website (bri.k-state.edu). All personnel proposing to work with infectious agents and/or rDNA at KSU must complete the applicable training modules prior to final IBC approval of the project (k-state.edu/comply/ibc/). The training modules must be completed only once. Upon completion, the URCO will issue a Certificate of Completion of Training and maintain a permanent record of training in the database. For more information, check the Kansas State University Research Compliance homepage (<http://www.k-state.edu/comply/>). If the researcher is involved in dealing with **HUMAN SUBJECTS**, please visit www.k-state.edu/comply/irb for policies and guidance.
17. **Field safety:** Safety information on heavy equipment use and pesticide handling, etc. visit - https://www.ksre.k-state.edu/agsafe/manuals_forms/index.html and <https://www.ksre.k-state.edu/agsafe/training/index.html>
18. **Pesticide handling:** All workers (faculty, staff, and students) who are involved in handling pesticides should go through the EPA Worker Protection Standard Training available at <https://www.ksre.k-state.edu/agsafe/training/index.html>

19. **Training:** It is important that you visit training websites to learn about policies and take appropriate actions to create a safe working environment. You can get the necessary training, guidance information, and classes that are offered in fire safety, hazardous wastes, lab safety, protective safety, and others by visiting <https://www.ksre.k-state.edu/agsafe/training/index.html>

APPENDIX I

GLASSWARE

1. Deposit broken glassware into a relatively strong cardboard box labeled with **'BROKEN GLASSWARE'**
2. When the box is full, seal the box with Shurtape or other relatively strong tapes.
3. Label it for a pick-up.
4. Ask a custodian to pick it up for proper disposal.

PROPER DISPOSAL OF USED SHARPS

1. Deposit the used sharps including needles, syringes, scalpel blades and razor blades into a container labeled with **"SHARPS DISPOSAL ONLY"**
2. When the container is full, seal cover or seal the container
3. Call the KSU Department of Environmental Health and Safety (128 Dole Hall) at 785-770-2289 for pick-up service. You will need to tell them the location for the pick-up and your name and phone number.

BURNED-OUT FLUORESCENT AND HIGH-INTENSITY DISCHARGE BULBS

1. Place the burned-out bulbs in the designated container labeled with **"USED FLUORESCENT BULBS"** in the labs..
2. Call the Department of Environmental Health & Safety (128 Dole Hall) at 785-770-2289 for pick-up service.

DEALING WITH DISCHARGED BATTERIES

1. Remove the discharged batteries from your instrument. The batteries may contain lead (Pb) sealed, mercury, silver, nickel-cadmium (NiCad), lithium hydride, and other toxic materials.
2. They should be collected in the labs in a designated container. Call the KSU Department of Environmental Health and Safety (128 Dole Hall) at 785-770-2289 for pick-up

service. You will need to tell them the location for the pick-up, your name, and your phone number.

PREPARATION FOR CHEMICAL WASTE PICK-UP

1. The person responsible for the generation of the waste or the person in charge of the materials should handle the chemical waste
2. Label all containers describing the materials contained
3. Date all containers
4. Tops, caps, or lids are required on all containers
5. Non-compatible materials should be kept separated
6. Box groups of containers so that they can be carried easily by hand
7. Label the box "PUBLIC SAFETY – WASTE"
8. Call the KSU Department of Environmental Health & Safety (128 Dole Hall) at 785-770-2289 for a pick-up service. You will need to tell them the location for the pick-up, your name, and your phone number. Visit <https://www.k-state.edu/safety/environmental/hazardous-waste/> for more information. For radiation waste pick up, visit <https://www.k-state.edu/safety/radiation/request.html>

APPENDIX II

EVACUATION AND EMERGENCY PROCEDURES IF YOU DETECT AN EMERGENCY SITUATION

1. Verbally alert others in the area
2. Activate the nearest fire alarm if the building must be evacuated
3. From the nearest safe location, call 911. Do not hang up until the operator releases you.
4. Go immediately to your designated assembly area and report to your supervisor

IF THE FIRE ALARM SOUNDS

1. Stop what you are doing
2. Quickly turn off equipment and lights (if it is safe to do so)
3. Close all doors as you exit the building
4. Go immediately to your designated assembly area and report to your supervisor

LOCATE EXIT ROUTES

1. Each lab or work area has posted an EMERGENCY INFORMATION POSTER which shows the evacuation route. You should also be aware of other alternate exits.
2. **DO NOT USE THE ELEVATORS**

WHAT TO DO IN THE EVENT OF:

1. FIRE: If a fire occurs somewhere in the building, from a safe location, pull the nearest fire alarm to evacuate the building. Report to the designated area for accountability.
2. TORNADO: The University sirens will sound for a steady three-minute blast. You should move to the basement and stay away from the windows. **DO NOT USE THE ELEVATORS.** If you are outdoors, seek indoor shelter if possible. If an indoor shelter is not available, lie flat in a ditch or low spot. If you are on flat ground and are caught in the path of a tornado, always move at right angles to its path.
3. EARTHQUAKES: Go to an area where falling objects are less likely to hit you and/or exit any building that may not withstand the stress of an earthquake.
4. THREATS: Alert your supervisor and clear the area of all personnel. Once in a safe area, notify the proper authorities.
5. EXPLOSION: If an explosion occurs somewhere in your building, from a safe location, pull the nearest fire alarm to evacuate the building. Report to your designated area for accountability.

LIGHTENING: If lightning threatens when you are inside, stay inside. Stay away from open doors or windows, radiators, metal pipes, sinks, and plug-in electrical objects. Do not use the landline telephone. If you are in the field and you see lightning **ANYWHERE IN THE SKY – NO MATTER HOW FAR AWAY IT APPEARS TO BE – YOU ARE TO SEEK SHELTER IMMEDIATELY.**