

## K-State Plant Pathology Department LABORATORY SAFETY PRACTICES

3-19-03

---

The Department of Plant Pathology at Kansas State University (KSU) 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 biohazardous materials. Specific laboratory safety rules can be found in the *KSU Laboratory Safety Manual* and the *KSU Radiation Safety Manual*. These safety manuals also can be found on the KSU Public Safety Department homepage (<http://www.ksu.edu/safety/programs.htm>). K-State Research and Extension *EMERGENCY ACTION MANUAL* is available on the web at (<http://www.oznet.ksu.edu/agsafe/Emergency%20Manual.pdf>). The following laboratory safety practices are expected for all laboratories. If you have questions concerning safety, direct them to your supervisor, a member of the safety committee, or the Department Safety Officer.

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

#### **1. Job Related Injuries, Incident Investigation and Reporting**

KSU employees injured on the job should seek medical care as follows: **LIFE THREATENING:** Call 911 or report to the emergency room at Mercy Hospital (telephone: 785-776-3322) 1823 College Avenue. **NON-LIFE THREATENING:** report to Occupational Health-Mercy West, 315 Seth Childs Road, (8:00 a.m.- 5:00 p.m., Monday through Friday). If closed call the 24-Hour Occupational Health Hot Line – 785-323-6000 or toll free – 1-866-323-6003. 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 Plant Pathology Human Resources Person in the main office immediately or as soon as possible. You are required to fill out two forms within three days of the incident. 1) Kansas State University Injury Report (*Appendix I*). 2) College Of Agriculture Incident Report (*Appendix II*). Once completed return them to the Department Human Resource Person it will then be filed with the Division of Human Resources. The Incident Report will be filed with the Department Safety Officer and the College of Agriculture Safety Coordinator. 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 Department Safety Officer. For investigation and reporting procedures, please check the K-State Research and Extension homepage ([http://www.oznet.ksu.edu/pr\\_agsafe/generalsafetywords.htm](http://www.oznet.ksu.edu/pr_agsafe/generalsafetywords.htm)).

## **2. Equipment**

Each lab is responsible for equipment /instruments/supplies in their lab. Do not use any piece of equipment until the operation of it 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.** Guidelines for the proper use of the Autoclave Room (RM 4404) are outlined in *Appendix III*.

## **3. 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.

## **4. Laboratory Smoking Policy**

Smoking is strictly prohibited in all campus buildings. The proximity to hazardous toxic, radioactive, infectious and flammable substances makes smoking in laboratories a risk of ingestion and fire.

## **5. 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 as persons working in the laboratory, and be made aware of the hazards in the laboratory. Anyone under the age of eighteen has to be under immediate and direct supervision of a qualified authorized person at all times.

## **6. Evacuation Procedures**

Each lab has an exit route posted and a designated assembly point outside the building. Once all personnel are accounted for the lab supervisor should report to the Dept. Safety Committee Member who will be located at the flagpole in front of the Military Science Building. For additional emergency information see *Appendix VIII*.

## **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 into a laboratory. Do not use microwave ovens for heating food in such laboratories. The Department of Plant Pathology has a refrigerator and a microwave oven in 4023 Throckmorton Hall that can be used for storing and heating food/drink.

## **8. Personal Protection Equipment (PPE)**

Splashing toxic and hazardous materials onto exposed skin or into the eyes can cause serious health problems. The risk of exposure may arise from spilled or splashed chemicals when inappropriate clothing (e.g. shorts and short skirts) 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 eyes exists. Personal Protective Equipment (e.g., laboratory coats and gloves) does not belong in public areas and should be stored properly in the laboratory. For example, laboratory coats can be hung near the door inside the laboratory if they are not in use.

## **9. Safety and Emergency Equipment**

Safety and emergency equipment includes fire extinguishers, first aid kits, emergency eye wash stations and emergency showers, spill kits, fire alarm pull stations, emergency telephones, and emergency exits. Learn and know what to do in an emergency, learn and know how to do it, learn and know where the necessary items are located.

## **10. Safe Handling and Storage of Chemicals, Solutions**

Never pipette or suction materials with your mouth. Always perform all procedures involving the liberation of volatile or toxic or flammable materials in a fume hood to eliminate the risk at the source. All chemical storage bottles should be labeled with content names, dates of acquisition/preparation, and any special safety/hazard notes. Chemicals should be stored based on compatibility. For more information on chemical compatibility, please contact K-state Research and Extension Safety Coordinator at 532-7068 or check the *KSU Laboratory Safety Manual* (<http://www.ksu.edu/safety/progrm10.htm>). In addition, any equipment that is used for radioactive materials should be clearly labeled with radiation warning sign(s).

## **11. Avoidance of Toxic and Hazardous Contamination**

Insertion or removal of contact lenses and any other manipulations, and application of cosmetics 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 is dedicated to use for 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 Extension homepage ([http://www.oznet.ksu.edu/pr\\_agSAFE/pesticide&fertilizersafety.htm](http://www.oznet.ksu.edu/pr_agSAFE/pesticide&fertilizersafety.htm)). Because wearing of 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 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 room 4404.

## **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, fluorescent 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 possibly escape from the lamp if discarded in a sanitary landfill, leading to the contamination of the groundwater. The KSU Department of Environmental Health & Safety recycles all burned-out fluorescent and HID lamps and discharged batteries. For properly disposing broken glassware, please see *Appendix IV*. For preparations of pick-up services for used sharps, discharged batteries, burned-out lamps, and chemical waste, please see *Appendix V, VI, and VII*, respectively.

## **15. Radiation Safety**

The faculty member responsible for the research project(s) must obtain a license to use radioactive materials. Licensees 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.ksu.edu/safety/program3.htm>) or contact the KSU Radiation Safety Officer(s) at 532-5856. 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. Topics of the training include 1) basic characteristics of radioactivity and radiation, 2) risk assessment, and 3) radiation protection.

## **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. All personnel listed in the IBC Registration Document as 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. 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.ksu.edu/research/compliance](http://www.ksu.edu/research/compliance)).

### **APPENDIX III: THE AUTOCLAVE ROOM (Room 4404)**

The autoclave room is a common use area used by almost every lab in the department. In order to maintain it as an appropriately clean facility we ask that you please read and follow the guidelines below. Your supervisor is responsible for training you on the proper use of the equipment in this room. **If you should have any questions, comments, or suggestions concerning the autoclave room or the equipment in it please see me...I can be found in Room 4026.**

#### **GENERAL GUIDELINES:**

- 1) If something breaks or needs attention please let me know as soon as possible.
- 2) If you use the sinks to wash dishes, clean up the area when finished. If you use the sponges, please ring them out when done.
- 3) If you spill something, **clean it up!** It only takes a few minutes.
- 4) Before you leave anything in the room for the long term (on the counters, in the drawers or cabinets) please check with me.
- 5) Clean any agar etc. from the sinks.

#### **AUTOCLAVES:**

- 1) There is a sheet by each autoclave you are to fill in all of the information (date, time in, your name, lab, & purpose) **BEFORE** using the autoclave. If you don't fill in the information and I happen to pass through I will terminate the run and you can start again after filling in the information.
- 2) Close the autoclave door when run is finished.
- 3) When new people start to work in your lab make sure you show them how to operate the autoclaves.
- 4) Do not use AUTOCLAVE THREE OR FOUR for discard autoclaving.

#### **AUTOCLAVE/BIOHAZARD BAGS:**

- 1) Only ONE bag per tray, only fill bag ½ full.
- 2) Put your **PROFESSORS NAME** and **LAB ROOM** number on every bag in **BIG BOLD PRINT**. (There is a marker in the box with the deodorizers).
- 3) **THERE IS ABSOLUTELY NO REASON TO LEAVE UNAUTOCLAVED BAGS IN THE ROOM. IF THE AUTOCLAVE IS IN USE TAKE THE BAG BACK TO YOUR LAB.**
- 4) Use the deodorizers provided....they are located on the wire shelving unit.

- 5) **Once the bag has been autoclaved you're responsibility is to:**
- A. Remove it from the autoclave, set it on the wire shelve unit (in the tray) to cool, and once it has cooled place it in a large plastic bag.
  - B. Clean out any solidified agar in the bottom of the tray and place it in a large plastic bag.
  - C. Wash out tray in the **ISLAND SINK** and **CLEAN OUT THE SINK.**
  - D. Place tray on the wire shelve unit and the bagged biohazard bags on the cart.

### **WASHER/DRYER RULES OF THE ROAD:**

**THIS WASHER AND DRYER ARE TO BE USED ONLY BY MEMBERS OF THE DEPARTMENTS OF PLANT PATHOLOGY, AGRONOMY or USDA/ARS. ANYONE ELSE must talk to Bruce Ramundo- Room 4026 (2-1338) BEFORE using them.**

1. These machines are for work related use only.... such as Laboratory Coats, soiled towels generated in the Laboratory, and Pesticide contaminated clothing worn while spraying in the greenhouse or field. **DO NOT USE THESE MACHINES TO DO YOUR FAMILY WASH.....**
2. Sign up on the sheet before you use the machines.
3. Promptly remove your clothes from the washer or dryer. Remember to clean out the washer.
4. Each lab is responsible for providing its own detergent.
5. If you are using isotopes make sure the articles you are washing are not **RADIOACTIVE.**

### **WASHING/DRYING PESTICIDE CONTAMINATED CLOTHING:**

1. Do not wash with other clothing
2. Wash a few items at a time- use the highest water level setting
3. Use a heavy-duty detergent and hot water for the wash cycle.
4. Rinse work cloths twice in warm water.
5. If items are moderately to heavily contaminated use two complete machine cycles.
6. Clean the machine by running the washer through one complete cycle without clothing, but with detergent and hot water.

7. IF POSSIBLE hang your clothes outside on a clothesline line to dry. If you must use a clothes dryer, use the hottest setting possible.

#### **APPENDIX IV: PROPER DISPOSAL OF BROKEN 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 another relatively strong tape;
3. Label it again if "BROKEN GLASSWARE" has been covered by the tape;
4. Ask a custodian to pick it up for proper disposal.

#### **APPENDIX V: 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 & Safety (108 Edwards Hall) at 532-5856 for a pick-up service. You would need to tell them the location for the pick-up, your name and phone number.

#### **APPENDIX VI: BURNED-OUT FLUORESCENT AND HIGH INTENSITY DISCHARGE LAMPS**

1. Place the burned-out bulbs in the designated container labeled with "USED FLUORESCENT BULBS" in room TH 1801;
2. The Department will call the KSU Department of Environmental Health & Safety (108 Edwards Hall) at 532-5856 for a pick-up service.

#### **APPENDIX VII: DEALING WITH DISCHARGED BATTERIES**

1. Remove the discharged batteries from your instrument. The batteries can be all lead (Pb) sealed, alkaline, mercury, silver, nickel-cadmium (NiCad), lithium hydride, and others;
2. They are collected in the Plant Pathology mail room;
3. If the discharged batteries are wet cell batteries, call the KSU Department of Environmental Health & Safety (108 Edwards Hall) at 532-5856 for a pick-up service. You would need to tell them the location for the pick-up, your name and phone number.

### **APPENDIX VIII: PREPARATION FOR CHEMICAL WASTE PICK UP**

1. The person responsible for the generation of the waste or the person in charge if 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. Noncompatible 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 (108 Edwards Hall) at 532-5856 for a pick-up service. You would need to tell them the location for the pick-up, your name and phone number.

### **APPENDIX VIII: 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.

### **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.**

**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.

**TORNADO:** The University sirens will sound for a steady three-minute blast. You should move to the basement and stay away from 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.



**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.

**THREATS:** Alert your supervisor and clear the area of all personnel. Once in a safe area notify the proper authorities.

**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 lightening 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 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.**