Section 8. Ordering, Receiving and Storing Pesticides and Other Hazardous Chemicals, Flammable/Combustible Liquid Storage Information

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8.1 Pesticide Regulations

8.1.1 Washington State Department of Ecology

The Washington State Department of Ecology is responsible for the protection of the environment of Washington State. As responsible citizens and stewards of the land we must exercise good judgment in the use of materials that can have adverse effects on the environment. At the TFREC, the Director, all supervisors and all employees must work together to ensure that no ecological factors are abused and that no human life or untargeted animal is endangered by our use of pesticides and other toxic materials.

8.1.2 Washington State Department of Agriculture

The Washington State Department of Agriculture (WSDA) General Pesticide Regulations (WAC 16-228) are a valuable source of information to guide us in these goals. The Washington State Department of Labor and Industries also regulates the activities of agricultural workers and provides measures to protect their safety from harmful pesticide exposure. For information regarding pesticide usage or registration, the WSDA may be reached at (360) 902-1800.

8.1.3 U.S. Department of Transportation

The U.S. Department of Transportation (USDOT) requires that the shipping, labeling, packaging or receiving of hazardous materials or other dangerous goods be performed by a person that has received USDOT training applicable for their duties, and who is current in their certification. To satisfy this requirement, the TFREC will ensure that USDOT training is provided for at least one of the front office staff.

Therefore, all packaging, labeling, shipping and receiving of hazardous materials, regardless of the amount, must be performed by the USDOT trained Hazardous Materials Shipping Coordinator.

Chemicals or other materials are defined as hazardous if the package label bears any of the following words; "Danger", "Warning", "Caution", or if the chemical is listed as a flammable, acid, caustic, oxidizer, poison, explosive, dangerous when wet, radioactive, spontaneously combustible or bio-hazardous.

Requirements for shipping hazardous materials via air freight differ from ground freight requirements so it is essential that you inform the Hazardous Materials Shipping Coordinator if your hazardous material shipment will be sent via air freight.

All TFREC personnel that handle hazardous materials must have general awareness training in DOT HM-181 hazardous materials in order to understand necessary requirements for receiving, handling, and sending these types of materials.

8.2 Ordering and Receiving Pesticides and Hazardous Materials

8.2.1 Buyer Responsibilities

Whenever these materials are ordered, the buyer must submit a list of precautions to the Hazardous Materials Shipping Coordinator so that, when the products arrive, the individuals receiving those products will understand their responsibilities in handling these products safely. In this way the products can be properly and promptly handled upon receipt. Those receiving the materials and signing the paperwork must have the appropriate level of USDOT hazardous materials training.

8.2.2 Receiving Packages

When a package is received, the person receiving it should first examine the package for signs of leakage such as stains, moisture, the presence of powders on the outside, odors, and if the package is badly damaged the integrity of the hazardous materials container is suspect. If these conditions exist, the package should not be accepted, and should remain the shipper's responsibility. The sender of the material, and the intended receiver should be contacted and notified about this situation.

8.2.3 Secondary Containment

Several secondary containers will be maintained in the receiving closet at the front entrance of the Overley Building so that any hazardous materials received can be placed in them upon arrival. This will minimize the possibility that uncontrolled spills or leakage may occur.

8.2.4 Safe Storage

As soon as feasible, all containers of hazardous material should be removed by the persons ordering them or by their staff. The containers should be taken to points of safe storage, e.g., the TFREC Hazardous Waste building, the USDA Hazardous Chemical Storage Building, safety cabinets in other buildings, etc.

Pesticides and other hazardous materials should always be stored in a location and structure suitable for the materials. The TFREC pesticide storage building meets the relevant criteria and it is the designated location for the storage of all research pesticide materials. Other hazardous

materials may be stored in designated locations, e.g., safety cabinets, the USDA Hazardous Chemical Building, etc.

- Pesticides and other chemicals must be stored in compatible groups, e.g., do not mix acids and bases, oxidizers and flammables, strong oxidizers and reducers, etc.
- All storage should provide secondary containment so that, in the event of leakage, spread is minimized.
- Security provisions are to be provided to restrict unauthorized accessibility, and ventilation suitable for the hazard must be provided.
- Proper labeling of containers must be observed, and it is best to rotate stocks of chemicals.
- Periodic inventories will help to make this feasible.
- Compounds prone to form organic peroxides such as ether, THF, dioxane and others should never exceed six months in inventory and should be disposed of properly if not used during that time.
- Finally, the structure or area of storage must be placarded with the proper warning sign(s).

8.2.5 Safe Handling

Handling and dispersing hazardous materials will be done with the care appropriate for the nature of the material. Only individuals with the proper knowledge and training and any required license, or persons under the direct supervision of such a qualified individual, will perform these tasks.

The Agricultural Worker Protection Standard (WAC 296-307) contains information specific to the handling and application of pesticides and must be familiar material for every supervisor at the TFREC.

Posting of pesticide applications is provided in the Overley Building and at the Wenatchee, Columbia View and Sunrise orchard shops, and on the web (http://www.tfrec.wsu.edu/pages/Admin/Pesticide_Applications). It is the responsibility of every employee to check these boards to learn what, if any, re-entry periods apply to areas of intended work. Greenhouses must also be posted when pesticides are applied in them.

8.2.6 Disposal

Disposal of wastes and unwanted or unusable chemicals should be done according to the rules outlined in the Safety Policies and Procedures Manual (SPPM 5.66). Unwanted chemicals should never be left in storage indefinitely because this exacerbates the possibility of spills and hazardous situations. Wastes must also be properly kept according to the Safety Policies and Procedures Manual (SPPM 5.68). When the necessary forms are filled out and approved, wastes are accepted by the EH&S Department for disposal. However, whenever possible, unwanted chemicals should be recycled, i.e., given to someone with a legitimate use for them, or returned to manufacturers or suppliers.

8.3 Allowable Amount of Chemicals in Storage

Maximum allowable size

	Flammable liquids			Combustible liquids	
Container type	**Class 1A**	**Class 1B**	**Class 1C**	**Class 2**	**Class 3**
Glass	1 pt	1 qt	1 gal	1 gal	5 gal
Metal or listed and approved plastic	1 gal	5 gal	5 gal	5 gal	5 gal
Safety cans	2 gal	5 gal	5 gal	5 gal	5 gal
Metal drums (DOT spec)**	N/A	5 gal	5 gal	60 gal	60 gal
Polyethylene (DOT spec. 34)	1 gal	2 gal	2 gal	60 gal	60 gal

N/A= not allowed

** Drum capacities refer to total volume allowed per container **but** these containers must be stored inside a proper storage cabinet or room.

Flammable liquid

Class 1A Flash point below 73 °F (22.8 °C) and boiling point below100 °F (37.8 °C).
Class 1B Flash point below 73 °F (22.8 °C) and boiling point at or above 100 °F (37.8 °C).
Class 1C Flash point at or above 73 °F and below 100 °F.

Combustible liquids

Class 2 Flash point at or above 100 °F (37.8 °C) and below 140 °F (60 °C).
Class 3 Flash point at or above 140 °F (60 °C) and below 200 °F (93.4 °C).

Hazard Category	**Maximum Volume Permitted in Lab or Shop Area**
1. Flammable and combustible liquids (FP <140 °F)	10 gallons (must be stored in 1-gal. containers)
2. Flammable liquids stored in flammable storage cabinets	
FP <73 °F, BP <100 °F	60 gallons
FP <73 °F, BP >100 °F	120 gallons
FP >73 °F (amount depends on BP)	180-660 gallons
Note: Do not store more than three flammable liquid storage cabinets in a single room (unless the room is Class H occupancy).	
3. Flammable solids	125 pounds
4. Highly toxic materials	
Solids and liquids (10 lb/gal factor)	1 pound
Gases	0 pounds
Toxicity categories that define the above: Oral rat: LD_{50} <50 mg/kg Rabbit dermal LD_{50} <200 mg/kg Inhalation, rat LC_{50}<200 ppm gas or vapor or LC_{50} <2 mg/liter mist, fume, dust	
Examples include phenyl mercuric acetate, naphthalene, naphthylamines, osmium tetroxide, sodium azide, vanadium oxide, allyl alcohol, arsenic acid, arsenic trioxide, mercuric chloride, mercuric bromide, cresols, chlorobenzenes, cyanide salts.	

Hazard Category	Maximum Volume Permitted in Lab or Shop Area
5. Organic peroxides (organic flammable compounds that contain the bivalent O-O double oxygen or peroxy-group)	
Class 1	5 pounds
6. Pyrophoric materials	0 pounds
Materials that spontaneously ignite in air at or below 37 ˚F. Examples: metallic lithium, sodium, potassium, white or yellow phosphorus, trimethyl aluminum.	
7. Oxidizers	
Class 4	0 pounds
Class 3	10 pounds
Class 4—Oxidizing materials that can undergo an explosive reaction when catalyzed or exposed to heat, shock or friction. Examples are hydrogen peroxide >91%, perchloric acid >72.5%, ammonium perchlorate, ammonium permanganate, guanidine nitrate. Class 3—Oxidizing materials that will cause severe increase in burning rate of combustible material with which they come in contact. Examples include hydrogen peroxide 52-91%, perchloric acid 60-72.5%, calcium hypochlorite >50%, sodium chlorate, sodium chlorite >40%, potassium chlorate, potassium bromate.	
8. Water reactives (Class 3)	0 pounds
Materials that react explosively with water without requiring heat or confinement. Examples are triethyl aluminum, trimethyl aluminum, bromine pentafluoride.	
9. Unstable reactive materials	
Class 4	0 pounds
Class 3	0 pounds
Class 2	50 pounds
Class 4—Readily capable of detonation, explosive decomposition or explosive reaction at normal temperatures and pressures. Includes materials which are sensitive to mechanical or localized thermal shock at normal temperatures and pressures. Examples are dinitrobenzene, dry picric acid, dibutyl peroxide. Class 3—Capable of detonations or of explosive decomposition or explosive reaction, but require a strong initiating source, or which must be heated under confinement before initiation of reaction. Examples are nitromethane, paranitroaniline, hydroxylamine. Class 2—Normally stable. Readily undergo violent chemical change, but do not detonate. Examples are acrolein, hydrazine, sodium perchlorate, styrene, vinyl acetate.	

All quantities exceeding the above listed limits must be stored in an appropriate chemical storage building. To do otherwise is to break the law as well as risk one's well-being as well as that of fellow employees.

- It is the responsibility of each laboratory supervisor to control the amount and type of fuel sources and the ignition sources in his/her lab.
- It is the responsibility of the vehicle mechanic to control fuel sources and ignition sources in the TFREC farm shop.
- Flame failure devices on the three TFREC boilers should be tested monthly to ensure proper operation.
- Fuel sources consist of acetylene in the Overley building labs 122D, hydrogen in 122E, alcohol compounds in most labs, acetylene, propane, paints, solvents, oil, gas, and diesel in the shop area.
- Natural gas is piped throughout the Overley lab, USDA building, the Entomology building, greenhouses, and the shop.
- The USDA chemical storage building contains the greatest amounts of flammable material.
- Extinguishers are placed throughout each building for the purpose of extinguishing fires. Chelan Co. Fire Department should be called to extinguish any fire, regardless of size.

8.4 Special Precautions for Class 1 Flammable Liquids

Bonding and grounding is necessary when transferring Class 1 flammable liquids (FP $\leq$100 °F) from one metal container to another. The liquids may form flammable vapor-air mixtures when being handled or in storage. Unbonded and ungrounded containers allow the possibility of a spark being generated by the differences in static electric potential of the containers.