

Best Management Practices for Pesticide Storage

Rationale

Greenhouse pesticide storage areas contain significant quantities of concentrated chemicals. These chemicals must be stored and managed properly to prevent the potential release of chemicals that may cause harm to human health and the environment. Some potential problems associated with pesticide storage areas include risk of spills during storage, mixing or loading operations; loss of security; accumulation of unwanted, old, or unregistered materials;

and the risk of fire, flooding or some other disastrous event. These problems can be minimized through the proper use of building security, temperature control, fire prevention and suppression equipment, inventory control, proper containment, emergency mitigation/planning, preventive maintenance, good housekeeping, user education and product knowledge.

Environmental Principle: Greenhouse pesticide storage areas contain significant quantities of concentrated chemicals. These chemicals must be stored and managed properly to prevent the possibility for release to and contamination of the environment.

Operational Aspects	Environmental Assurance >>		
	Level 1	Level 2	Level 3
Overview			
Emergency Preparedness	all staff know to call 911 in the event of an emergency; emergency contact numbers are posted	emergency contact numbers are posted; all staff trained to call emergency contact numbers; staff have basic training in cleaning up small pesticide spills	emergency contact numbers posted; all staff trained to call emergency contact numbers; staff have basic training in cleaning up small pesticide spills; emergency response plan located in storage area and on file with emergency contacts; staff trained to respond to different emergency scenarios
Environmental Awareness	staff are aware of hazards to the environment associated with pesticide spills and cross-contamination; hazards corrected when a problem occurs	staff are aware of hazards to the environment associated with pesticide spills and cross-contamination; hazards are identified and corrected	staff are aware of hazards to the environment associated with pesticide spills and cross-contamination; hazards are identified and corrected; hazards are actively reduced

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Training	all staff have minimum training such as Federal Worker Protection Standard (WPS) and have completed the basic checklist training; staff without WPS Handler training or NYS DEC Pesticide Certification are not to enter the pesticide storage area without a certified applicator or specific training; information is posted and staff are trained on how to respond to and report pesticide spills	all staff have minimum training such as Federal Worker Protection Standard (WPS) and have completed the basic checklist training; staff without WPS Handler training or NYS DEC Pesticide Certification are not to enter the pesticide storage area without a certified applicator or specific training; staff receive instruction from experienced users regarding proper pesticide storage management activities; information is posted and staff are trained on how to respond to and report pesticide spills	all staff have minimum training such as Federal Worker Protection Standard (WPS) and have completed the basic checklist training; staff without WPS Handler training or NYS DEC Pesticide Certification are not to enter the pesticide storage area without a certified applicator or specific training; all staff who are actively handling pesticides and/or application equipment in the pesticide storage area are trained by supervisor, qualified personnel and by attending continuing educational training opportunities as required by NYS DEC pesticide certification and the Cornell Health and Safety Policy 8.6; pesticide storage policy reviewed with staff, information is posted and staff are trained on how to respond to and report pesticide spills
Communication	pesticide storage guidelines are discussed during new staff training sessions	pesticide storage guidelines are posted at the pesticide storage facility and discussed during new staff training sessions; any changes are communicated with all staff	pesticide storage guidelines are posted at the pesticide storage facility and discussed during new staff training sessions; greenhouse staff gain knowledge of pesticide storage best practices through attendance at training programs, peer discussions, staff meetings and work experiences
Storage Area			
Designated Storage Area	designated storage area is labeled as such	designated storage area is labeled as such; locked and accessible to trained personnel only	designated storage area is labeled as such; locked and accessible to trained personnel only

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Location of Storage Area	area within building structurally segregated from general work areas; site factors are not considered in selecting storage area	wing or corner on ground floor of a building dedicated for other purposes; some consideration given to location of storage area away from extreme heat, flooding, and environmentally sensitive areas	building or area dedicated to chemical storage: separated from offices, workshops, laboratories, surface water; flooding unlikely; downwind and downhill from sensitive areas such as houses & ponds; soil, geologic, and hydrologic site characteristics will not lead to contamination of any water systems through runoff or percolation
Building Materials	common construction materials; no special properties; wooden shelves are not permissible; floors must be impervious to chemicals or secondary containment is in place	construction materials are largely fire resistant; no wooden shelves; floors must be impervious to chemicals or secondary containment is in place	almost all construction materials fire resistant; intrinsically safe electrical components; metal, water-resistant, or chemical-resistant shelves; floors impervious to chemicals
Containment	no floor drain unless raised to provide a reservoir with a berm or temporary plug; secondary containment used for unsealed containers	no floor drain unless raised to provide reservoir with a berm or temporary plug; all pesticides are stored in secondary containment	no floor drain; floor provides containment in the event of a spill; all pesticides are stored in secondary containment
Lighting	electrical lighting with few limited areas of view; no exposed lamps (all covered/caged)	electrical lighting allows view into all areas and cabinets within storage area; no exposed lamps (all covered/caged)	explosion-proof electrical lighting allows clear view into all areas and cabinets within storage area; no exposed lamps, contains emergency lighting
Security and Accessibility	separate entry with locked door; windows prohibit access	separate entry with locked door, windows prohibit access; access restricted to trained personnel	all entrances locked at all times; access restricted to trained personnel; procedure implemented to track keys to storage area or facility; may be fenced
Vermin Control	program is in place to control vermin	pesticide storage is constructed to conceal and prevent vermin access	pesticide storage is constructed to conceal and prevent vermin access; proactive in identifying vermin access and damage

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Temperature Control	no mechanical temperature control	no mechanical temperature control; area insulated; no direct sources of heat (sunny windows, steam pipes, etc.); space temperature range regulated relative to pesticide labels	active mechanical temperature control operated to maintain appropriate temperature; no indirect sources of heat (sunny windows, steam pipes, furnaces, etc.)
Ventilation	no mechanical ventilation	mechanical ventilation available, working, and used	mechanical ventilation available, working, and used; space is temperature and humidity controlled; there is continuous ventilation air exchange
Pesticide Mixing Area (if inside chemical storage area)	eyewash and spill kit are easily accessible	pesticide mixing area with good ventilation, easily accessible to storage area, emergency shower, spill kit and eyewash available in immediate vicinity	pesticide mixing area with dedicated ventilation, to storage, emergency shower, spill kit and eyewash available in immediate vicinity
Management			
Inspection of Storage Area	inspection of pesticide storage area performed when a problem arises, problems are addressed	quarterly inspection of pesticide storage area at least annually and emergency equipment, i.e. eye washes tested, problems addressed immediately; facility ventilation, electric, and fire suppression systems problems are reported and corrected	inspection of pesticide storage, and mixing/loading areas performed every four to six weeks; emergency equipment tested, problems noted and addressed; facility ventilation, electric, and fire suppression systems problems are reported and corrected
Record Keeping	inventory, pesticide labels, safety data sheets and logs of emergency equipment (i.e. eye washes and fire extinguishers) are maintained	inventory, pesticide labels, safety data sheets and logs of emergency equipment (i.e. eye washes and fire extinguishers) are maintained; training is documented and maintained	inventory, pesticide labels, safety data sheets and logs of emergency equipment (i.e. eye washes and fire extinguishers) are maintained; training is documented and maintained
Health and Safety	first aid kit, emergency shower and eye wash are readily available outside the storage area	first aid kit, emergency shower, and eye wash are readily available outside the storage area and are inspected periodically with a record kept of checks	first aid kit, emergency shower, and eye wash are readily available outside the storage area and are inspected regularly with a record kept of checks

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Contents	storage area contains pesticides, other greenhouse chemicals (but not fertilizers) segregated by compatibility, various application equipment; the storage area NEVER contains: food, drink, tobacco products, personal protective equipment, livestock feed, living plants, and/or seeds	storage area contains pesticides, other greenhouse chemicals (but not fertilizers) segregated by compatibility various application equipment; the storage area NEVER contains: food, drink, tobacco products, personal protective equipment, livestock feed, living plants, and/or seeds	storage area contains pesticides, other greenhouse chemicals (but not fertilizers) segregated by compatibility various application equipment; the storage area NEVER contains: food, drink, tobacco products, personal protective equipment, livestock feed, living plants, and/or seeds
Fire Prevention and Suppression	multi-media (ABC) fire extinguisher immediately available outside the pesticide storage area in the clean room and on the loading dock and inspected annually; no open flame or element heat source	multi-media (ABC) fire extinguisher immediately available outside the pesticide storage area in the clean room and on the loading dock and inspected annually; no open flame or element heat source; staff are trained on proper use of extinguishers; fire detection and alarm system present	flammable materials stored separately; multi-media (ABC) fire extinguisher immediately available outside the pesticide storage area in the clean room and on the loading dock and inspected annually; sprinkler system may be present; fire department notified annually of current inventory; staff are trained on proper use of extinguishers; no open flame or element heat source; fire detection and alarm system present
Inventory and Disposal	basic inventory record kept; unused or expired pesticide products discarded in adherence with federal, state regulations and Cornell policy; triple-rinsed empty pesticide containers are discarded according to current disposal/recycling regulations	inventory updated at least once per year; unneeded registered pesticides are transferred to other licensed Cornell pesticide applicators to minimize need for disposal; unregistered, expired, or unwanted pesticide products discarded in adherence with federal, state regulations and Cornell policy; triple-rinsed empty pesticide containers are discarded according to current disposal/recycling regulations	inventory actively maintained as pesticides are added or removed from storage; containers are dated when purchased; sufficient planning is done to eliminate the need for disposal of excess pesticides; unneeded registered pesticides are transferred to other licensed Cornell pesticide applicators if necessary; unregistered, expired, or unwanted pesticide products discarded in adherence with federal, state regulations and Cornell policy; triple-rinsed empty pesticide containers are discarded according to current disposal/recycling regulations

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Signage	warning sign(s) posted on entrances, basic emergency contact information is posted; door signage to include Hazard Assessment Signage Program (HASP) information https://sp.ehs.cornell.edu/lab-research-safety/research-safety/space-registration-(hasp)/Pages/default.aspx	warning sign(s) posted in view of entrances; emergency contact information posted; door signage to include Hazard Assessment Signage Program (HASP) information https://sp.ehs.cornell.edu/lab-research-safety/research-safety/space-registration-(hasp)/Pages/default.aspx	weatherproof warning sign(s) posted in view of entrances; emergency contact information posted; signage posted to indicate labels and SDSs is located at the Federal WPS Central Posting; door signage to include Hazard Assessment Signage Program (HASP) information https://sp.ehs.cornell.edu/lab-research-safety/research-safety/space-registration-(hasp)/Pages/default.aspx
Application Equipment Storage	all application equipment is stored in the chemical storage area or in another designated storage area	all application equipment is stored in the chemical storage area or in another designated storage area; all items used for handling pesticides are labeled “contaminated with pesticides” or otherwise clearly labeled	all application equipment is stored in the chemical storage area or in another designated storage area; all items used for handling pesticides are labeled “contaminated with pesticides” or otherwise clearly labeled
Spill Preparedness	spill clean-up materials (e.g., vermiculite, Slik-Wik®, or other commercial product) available within the general area; some staff trained in proper use of these materials	spill kits appropriate for pesticide spills are available at the storage area; all staff trained in proper use of kit and contents	spill kits appropriate for pesticide spills are available at the storage area in a designated/demarked area; all staff trained in the proper use of these materials; hydrated lime or high pH detergent also available for neutralization; designated shovel and/or buckets available for clean-up; spill material management is reviewed on an annual basis
Personal Protective Equipment (PPE) - Worn in Storage	gloves and eye protection are available for staff to wear in storage area	staff are required to wear gloves and eye protection in storage area when handling open containers or packages	staff wear gloves, appropriate footwear, and protective eyewear in storage area when handling open containers or packages

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Personal Protective Equipment (PPE) Storage	PPE, including gloves, aprons, and respirators, located in the general vicinity of the storage area; all those with access to storage know location of PPE; all PPE stored away from pesticides under appropriate environmental conditions; new and used PPE are segregated	PPE, including gloves, aprons, and respirators, located in the general vicinity of the storage area; all PPE stored away from pesticides under appropriate environmental conditions; all those with access to storage know location of PPE; separate area for each person; new and used PPE are segregated	PPE, including gloves, aprons, and respirators, is located in the general vicinity of the storage area; all PPE stored away from pesticides under appropriate environmental conditions ; all those with access to storage know location of PPE separate area for each person; new and used PPE are segregated
Containment			
Chemical Compatibility and Segregation	pesticides and fertilizers stored in separate designated storage areas	pesticides and fertilizers stored in separate designated storage areas; pesticides stored by hazard class (flammable, corrosive, toxicity/poison and reactive) and pesticidal function with incompatible materials stored physically separated from one another	pesticides and fertilizers stored in separate designated storage areas; pesticides stored by hazard class (flammable, corrosive, toxicity/poison and reactive) and pesticidal function with incompatible materials stored physically separated from one another; designated “disposal” area for surplus pesticides and empty containers being held for disposal/recycling
Containers	all pesticides stored in compatible containers with complete and accessible labels; labels are visible and readable; caps are secure; food or beverage containers are never used for storage	all pesticides stored in their original containers unless damaged; if original container is damaged, pesticides are stored in compatible containers with complete and accessible labels; labels are visible and readable; caps are secure; food or beverage containers are never used for storage	all pesticides stored in their original containers unless damaged; if original container is damaged, pesticides are stored in compatible containers with complete and accessible labels; labels are visible and readable; caps are secure; food or beverage containers are never used for storage

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Container Arrangement	labels in plain sight; all containers stored up-right	labels in plain sight; no containers on floor; all containers stored up-right; aisles wide enough to accommodate workers; containers not crowded on shelves; any corrosive chemicals are at eye level	labels in plain sight; no containers on floor; all containers stored up-right; aisles wide enough to accommodate workers; containers not crowded on shelves; pesticide inventory does not block vents in storage cabinets; older containers in front of newer containers; any corrosive chemicals are at eye level; avoid storing pesticides above eye level
Partially-used Containers	unsealed containers resealed and returned to storage	bags and boxes always opened neatly to maintain integrity; unsealed containers resealed and returned to storage; containers dated on receipt	bags and boxes always opened neatly to maintain integrity; unsealed containers resealed and returned to storage in secondary containment and labeled when appropriate; all drips are removed from rigid containers; all unsealed bags are placed inside another larger container, sealed and labeled; containers dated on receipt; pesticide container integrity inspected while maintaining inventory
Damaged Containers	when damaged containers are noticed, contents are repackaged and labeled or placed in suitable secondary containment that can be sealed and fully labeled	pesticide container integrity inspected while maintaining inventory; contents of damaged containers are repackaged and labeled or placed in suitable secondary containment that can be sealed and fully labeled; secondary label correct and complete	pesticide container integrity inspected for corrosion, leaks, loose caps, or bungs while maintaining inventory; damaged container contents are repackaged and labeled or placed in suitable secondary containment that can be sealed and fully labeled; secondary label correct and complete