

Best Management Practices for Greenhouse Equipment Use and Safety

Rationale

A variety of types of equipment, including autoclaves and soil mixers, are used in Cornell greenhouses. Training in safe operation and proper

maintenance of this equipment ensures its continued availability for use and protects the safety of those using it.

Environmental Principle: The safe and effective operation of equipment reduces the potential for injury to workers and environmental impacts.

Greenhouse Equipment

Standard stand-alone greenhouse equipment used by greenhouse staff that does not have specific regulatory requirements for use, such as specific OSHA standards or Cornell Environmental Health & Safety (EH&S) operative procedures, but does have risk associated with its use.

Note: The levels indicated in the table are as follows:

Level 1- minimum level of activities for greenhouse equipment use and safety. Activities at this level fulfill all University requirements, etc.

Level 2- acceptable level of activities for greenhouse equipment use and safety

Level 3- optimum level of activities for greenhouse equipment use and safety

Greenhouse managers should strive to reach at least Level 2 for all parts of the BMP's

Operational Aspects	Environmental Assurance >>		
	Level 1	Level 2	Level 3
Overview			
Emergency Preparedness	proper safety equipment that meets requirements is available, and maintained, for the job; staff can recognize equipment malfunction and are verbally instructed to notify supervisor in such an event	proper safety equipment that meets requirements is available, and maintained, for the job; staff can recognize equipment malfunctions and have been verbally instructed to notify supervisor in such an event	proper safety equipment that meets requirements is available, and maintained, for the job; staff receive documented training in limited operational response (e.g., shutting off valves) when they recognize equipment malfunction or hear equipment alarms; staff then notify supervisor or appropriate repair personnel for further response and correction; emergency preparedness plan is in place
Resource: Cornell Environmental Health & Safety (EH&S) Emergency Management			

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Environmental Awareness	staff are verbally instructed in appropriate actions to avoid environmental impacts through poorly maintained or broken equipment	staff receive documented training in appropriate actions to avoid environmental impacts, and training on the environmental impacts of their actions	staff receive documented training in appropriate actions to avoid environmental impacts, and training on the environmental impacts of their actions; staff receive documented training on the appropriate personal action in proper usage of the equipment and responding to equipment maintenance needs
	Resources: SHEM Greenhouse Environmental Awareness Training ; <i>SHEM Greenhouse Manager Equipment Use Training Notebook</i>		
Training	staff are verbally trained to use equipment properly	staff receive documented training in proper use of equipment	staff receive documented training in proper use of equipment and in the appropriate response to equipment malfunctions and follow up protocols
Communication	staff trained to use the equipment and report concerns to a supervisor as they occur	staff trained to use the equipment and report concerns to a supervisor as they occur; greenhouse staff and maintenance personnel discuss safe use of equipment and repairs where appropriate, maximizing effectiveness over machine life	staff trained to use the equipment and report concerns to a supervisor as they occur; greenhouse staff and maintenance personnel discuss safe use of equipment and repairs where appropriate, maximizing effectiveness over machine life; greenhouse staff and maintenance personnel meet regularly to discuss use, preventive maintenance, and foreseeable maintenance issues affecting greenhouse equipment
	Resource: Cornell EH&S Hazard Communication		
Management			
Operating Documentation	in addition to training, written operating instructions are available for all staff that use equipment	in addition to training, written operating instructions are provided to all staff that use the equipment; standard operating procedures (SOPs) are available for each piece of equipment	in addition to training, written operating instructions are provided for all staff that use equipment; standard operating procedures (SOPs) are available for each piece of equipment
	Resource: Cornell EH&S: Writing a Standard Operating Procedure		
Management Training	staff are verbally trained to use equipment properly; a list of those trained is maintained by the supervisor	staff receive documented training in proper use of equipment and review of SOPs; annual, signed documentation of training is maintained by the supervisor	staff receive documented training in proper use of equipment and review of SOPs; essential safety practices in written form are provided to each user
	Resources: Toolbox talks from Cornell EH&S or <i>SHEM Greenhouse Manager Equipment Use Training Notebook</i> . See links below.		

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	Level 1	Level 2	Level 3
PPE and Safety Equipment	necessary Personal Protective Equipment (PPE) available; use of PPE included in documented training	PPE appropriate for all users available; use of PPE included in documented training	each user has own PPE; use of PPE included in documented training and exhibited during use with all equipment
	Resources: Cornell EH&S PPE toolbox talk ; Cornell EH&S PPE Assessment Form (under Forms)		
Preventative Maintenance	equipment repaired when broken	occasional scheduled servicing in addition to essential repairs, where appropriate; maintenance record available	annual scheduled service including testing of efficiency/effectiveness; maintenance record available; foreseeable future repairs noted, and precautions taken to minimize repair interference with usage
Routine Maintenance	equipment repaired when broken	good housekeeping practices instituted as part of routine maintenance; scheduled service based on frequency of use; maintenance record available	good housekeeping practices instituted as part of routine maintenance; necessary maintenance before and after every use; maintenance record available
	Resource: Greenhouse Equipment Scheduled Maintenance		
Greenhouse Equipment Guarding	staff are verbally trained on guarding; equipment and guards are inspected before using	staff receive documented training in proper guarding; equipment and guards are inspected routinely and before using	staff receive documented training in proper guarding and in the appropriate response to guarding malfunctions and follow up protocols; equipment and guards are visually inspected daily, inspected routinely and before using
	Note: Cornell EH&S should be contacted with guarding questions and concerns (Phone: 607-255-8200) Resources for Signage: See links below		
Safety	information on safe use of equipment provided during training	information on safe use of equipment provided during documented training	information on safe use of equipment provided during training; equipment evaluated for safety issues during operation annually and improvements made as soon as possible
	Resources: OSHA Basics of Machine Safeguarding ; EHS on-line training machinery guarding and health and safety basics		
Safety of Non-users	signage discussing equipment hazards posted on equipment	signage discussing equipment hazards posted on equipment; access to equipment by non-users limited	signage discussing equipment hazards posted on equipment; access to equipment by non-users prevented
	Resource for Signage: CALSOEH web page greenhouses/maintenance-equipment-use		

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Risk Assessment	supervisors evaluate potential safety risks and take action as necessary	supervisors and users evaluate potential safety risks and take action as necessary; assessed risks and actions documented by supervisor	supervisors train users to evaluate potential safety risks during annual training; assessed risks and actions documented by supervisor; action taken is based on discussion of risks by supervisors and users
Ergonomics	staff are verbally trained on ergonomics; resources are made available to staff by supervisors	staff receive documented training on ergonomics by supervisor; ergonomics information from Cornell MIPP posted; Cornell MIPP consultants do job analysis at work site and update job analysis if equipment or jobs change; existing equipment adapted to improve ergonomics, based on job analysis as practical	staff receive documented training on ergonomics Cornell MIPP staff; ergonomics information from Cornell MIPP posted; Cornell MIPP update job analysis and training materials approximately every three years; appropriate equipment installed to improve ergonomics of required activities, based on job analysis
	Resources: Cornell EH&S Ergonomics ; Cornell Musculoskeletal Injury Prevention Program (MIPP)		
Record Keeping	documentation of all training and repairs	documentation of all training, repairs and maintenance	documentation of training, maintenance, repairs and concerns suggested by users; equipment-based record keeping where available (e.g., data recorders)

Helpful Links

- Collage of Agriculture & Life Sciences (CALs) Occupational & Environmental Health (OEH)** <http://oeh.cals.cornell.edu>
- Cornell EH&S: Occupational Safety and Health** <http://sp.ehs.cornell.edu/osh/pages/default.aspx>
- EH&S New York State Agricultural Experiment Station (NYSAES)** <http://sp.ehs.cornell.edu/geneva-ehs/Pages/default.aspx>
- EH&S Training Course Listing: CULearn** <http://sp.ehs.cornell.edu/training/Pages/default.aspx>
- Hazard Communication** <https://sp.ehs.cornell.edu/osh/occupational-health/hazard-communications/Pages/default.aspx>
- OSHA Compliance Link** <http://www.osha.gov/>
- Cornell EH&S: Lock/Tag/Verify** <http://sp.ehs.cornell.edu/osh/occupational-safety/lock-tag-verify/Pages/default.aspx>
- Cornell EH&S: Ergonomics Toolbox Safety Talk** <http://sp.ehs.cornell.edu/osh/occupational-health/ergonomics/Pages/default.aspx>
- Cornell Musculoskeletal Injury Protection Program (MIPP)** <https://hr.cornell.edu/benefits-pay/leaves-disability/musculoskeletal-injury-prevention-program-mipp>
- SafetySign.Com “Machine Guarding Labels”** <http://www.safetysign.com/machine-guarding-labels>
- My Safety Signs “Machine Guarding Signs”** <http://www.mysafetysign.com/machine-guarding-signs>