

Best Management Practices for Pest Control

Rationale

Chemical pesticides have the potential to cause harm to human health and the environment. Overuse, misuse, and careless application of chemical pesticides can result in the accumulation of toxic substances on greenhouse structures and on plants, and the possible development of pest resistance to the products applied.

The development of an integrated pest management program can reduce the need for chemical pesticides. Greenhouse staff should be trained to accurately identify pests, and to monitor insect populations. Records of pest problems and solutions should be maintained, and used in planning future control strategies.

Environmental Principle: It is important to incorporate an effective integrated pest control program to decrease reliance on pesticide use and increase the effectiveness of pesticides when needed. Decreased pesticide use will result in less potential harm to human health and the environment and will help to prevent pesticide resistance in target organisms.

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; staff have basic training in cleaning up small pesticide spills	emergency contact numbers posted; staff have basic training in cleaning up small pesticide spills; emergency response plan on file
Environmental Awareness	employees are informed of the impact pesticides can have on the environment	employees are introduced to alternative pest control measures and encouraged to implement them when possible	as appropriate, a program is established to incorporate IPM practices to maximize the benefits of pesticide applications while reducing environmental risks
Training	all staff and greenhouse users are trained, minimally, as WPS Workers; all staff and greenhouse users responsible for pesticide applications are in compliance with Cornell, state and federal regulations regarding applicator training	all staff and greenhouse users are trained, minimally, as WPS Handlers; all staff and greenhouse users responsible for pesticide applications are in compliance with Cornell, state and federal regulations regarding applicator training	all staff and greenhouse users are trained, minimally, as WPS Handlers; all staff and greenhouse users responsible for pesticide applications are in compliance with Cornell, state and federal regulations regarding applicator training

Operational Aspects	Environmental Assurance >>		
	Level 1	Level 2	Level 3
Communication	pest management plan is communicated orally and with fairly short notice to those responsible for implementation	pest management objectives are communicated well in advance to those responsible for implementation	written forms are submitted before each project begins, outlining research objectives, cultural requirements, pest management objectives, and pest tolerance threshold; meeting is held with greenhouse staff to discuss integrated pest management strategies as appropriate to the project
Management			
Monitoring and Recordkeeping	records kept of significant insect pests, disease and weed problems	records kept of weekly scouting results, sticky cards used to monitor	designated scout maintains records weekly, changes sticky cards, and makes pest control decisions
Biological Control (when appropriate to the greenhouse use)	pesticide applications are minimized to avoid killing natural enemies	appropriate beneficial insects or microbials are introduced early in the course of pest population growth; pesticides used offer least toxicity to beneficials	IPM program is in place; needs for beneficial insects and microbials are anticipated based on experience of past seasons; minimal pesticide use as appropriate to the research design
Pest Containment	infected or infested plants are tagged; movement of people, equipment or plants carrying pests is restricted	all new plants are carefully inspected before they enter greenhouse; infected or infested plants are tagged; movement of people, equipment or plants carrying pests is restricted; greenhouse staff and users avoid contact with infected or infested plants	if quarantine space is available, all new plants remain in quarantine for an appropriate period before they enter greenhouse; all new plants are carefully inspected; infected or infested plants are tagged; movement of people, equipment or plants carrying pests is restricted; greenhouse staff and users avoid contact with infected or infested plants; infected or infested plants are quarantined or destroyed if treatment is not effective

Operational Aspects	Environmental Assurance >>		
	Level 1	Level 2	Level 3
Pest Exclusion	doors to greenhouse rooms are kept shut	doors to greenhouse rooms are kept shut; screens installed over vents whenever possible, integrity checked twice yearly; door seal checked regularly	doors to greenhouse rooms are kept shut; screens installed over vents whenever possible, integrity checked monthly; door seal checked regularly; cracks in structure between houses sealed to prevent movement of pests; foot bath or pad kept in place to clean shoes before entering
Chemical Selection	after pest identification, an appropriate recommended legal product for the crop and pest is used, applied only as needed and according to the label	after pest identification, an appropriate recommended legal product for the crop and pest is used, applied only as needed and according to the label; the development of pest resistance to products is mitigated through consideration of alternate modes of action	after pest identification, an appropriate recommended legal product for the crop and pest is used, applied only as needed and according to the label; development of pest resistance to products is mitigated through consideration of alternate modes of action; reduced risk pesticides, such as insect growth regulators, are selected whenever possible
Plant Care	water and fertilizer applied as needed	water and fertilizer applied as needed; plants transplanted to larger pots to maintain vigorous growth	water and fertilizer applied as needed; plants transplanted to larger pots to maintain vigorous growth; plants are pruned, staked and tied as needed
Sanitation	bench top, floors, pots & equipment are disinfected and plants are disease- and insect-free at beginning of project	bench top, floors, pots & equipment are disinfected and plants are disease- and insect-free at beginning of project; debris and infected plant material removed weekly during project	bench top, floors, pots & equipment are disinfected and plants are disease- and insect-free at beginning of project; debris and infected plant material removed weekly during project; a routine is planned and discussed with GH staff for disinfecting tools during project
Handling			
Pesticide Application Safety	telephone or 2-way communication available to pesticide applicator	two people always present during pesticide applications	two people always present during pesticide applications

Operational Aspects	Environmental Assurance >>		
	Level 1	Level 2	Level 3
Pesticide Application Technique	calendar-based applications are avoided; spot sprays used when pesticide's mode of action is physical (soaps and oils)	calendar-based applications are avoided; spot sprays used when pesticide's mode of action is physical (soaps and oils); applications based on scouting results	calendar-based applications are avoided; spot sprays used when pesticide's mode of action is physical (soaps and oils); applications based on scouting results and timed to the susceptible stage of the pest or disease; application method (hydraulic, ULV, aerosol, etc.) is chosen to ensure good coverage of the target pest
Pruning and Rogueing	dead plants are discarded weekly; compost is removed from greenhouse immediately	infected or infested plant tissue is pruned and discarded when transplanting; dead plants are discarded daily; compost is removed from greenhouse immediately	infected or infested plant tissue is pruned and discarded weekly; dead plants are discarded daily; compost is removed from greenhouse immediately