

Chicago Botanic Garden

Plant Health Care Department Mission Statement and Policy September 2009

The mission of the Plant Health Care (PHC) Department is:

to maintain the Garden's plant collection through a progressive Plant Health Care program stressing practices that have the least impact on the environment while still achieving the proper level of maintenance appropriate for a world class botanic garden, as well as being a model for the gardening industry.

The PHC Department's duties include: pest monitoring, insect management, disease management, animal pest management, weed management, fertilization, soil testing, pruning, and guiding proper cultural practices. All of these duties are carried out through integrated environmentally sensitive programs. The methods that are most commonly used to achieve our mission are cultural, mechanical, biological, and chemical.

Plant Health Care and Integrated Pest Management

Plant Health Care is a holistic philosophical approach for managing plant health that is practiced Garden wide, primarily by the PHC Department. It begins with proper plant selection and placement and includes a strong focus on cultural (maintenance) practices. The proactive goal is to have very healthy plants that can better withstand pests.

Integrated Pest Management is a key component of the Garden's Plant Health Care program, involving vigilant plant monitoring and well thought out pest management. It strives to reduce the use of pesticides while at the same time managing pest populations at a tolerable level. Pests (insects, diseases, weeds, and animals) are managed with methodology that is least intrusive on the environment. Alternate methods rather than chemical methods are used whenever possible.

The Plant Health Care Program is flexible and ever evolving to remain up-to-date with technology, seasonal changes, and the needs of the Garden.

Monitoring and Decision Making

The PHC Department regularly monitors the outdoor living collections, year-round, for potential problems such as insect levels, signs of disease, animal damage, or in general any factor that may pose a threat to the living collections. Garden monitoring is guided by records from past seasons, evaluations, weather data, degree-day accumulations, and phenology. Monitoring and decision making is primarily the responsibility of the PHC Supervisor. Also the PHC Specialists, PHC Volunteers, and Horticulturists perform Garden monitoring. Detailed records are kept for all monitoring observances.



When it is determined that a threshold of tolerance has been exceeded, corrective action will be taken. Action thresholds are determined by aesthetic criteria, as well as the short and long-term threats to the health of the plants. Thorough knowledge of the affected plant, the factor(s) causing the problem and typical response must be understood to determine action thresholds. The corrective action that is simplest, most effective, and least damaging to the environment is used. These actions may range from improving the cultural conditions, fertilization, removal of affected plant part, or removal of the plant, to the use of bio-rational treatments such as horticultural oil sprays, insecticidal soap sprays or *Bacillus* sprays. A true pesticide will be used only after all possible alternatives have been considered.

When pesticide use is warranted, selection of the proper chemical is carefully performed. A product that will be effective, uses the least amount of active ingredient, is safest for the applicator and public, and has the least amount of impact on the natural environment will be selected. In the application of conventional pesticides spot treatments are made focusing on the problem, not an entire area. Careful records are kept of all pesticide use. At year end, all pesticide use is summarized and reviewed by a committee made up of the Vice President of Horticulture, Director of Horticulture, Director of Collections, and other horticultural staff. From that meeting, modifications are made for the up-coming year if necessary.

Pest Management

There are known ornamental plant problems, primarily diseases, that are anticipated for each year and preventative treatments are planned. Some examples are apple scab on apple (*Malus*), rust on hawthorn (*Crateagus*), and blackspot on roses (*Rosa*). Other ornamental plant pest problems, primarily insects, discovered through monitoring are managed in an Integrated Pest Management format as described above.

Weed control (both broadleaf and grasses) on turf is primarily managed with a selective post-emergent (kill after the weed is visible) herbicide through a continuous season-long spot spray program, where targeted weeds are sprayed individually as needed. Blanket applications are avoided. Pre-emergent herbicides (kill before the weed emerges) are used only on a limited basis, often during establishment and renovation. Insect and disease problems on turf seldom require treatment; they are generally monitored and pass before causing damage.

The majority of weed control for beds on Grounds is managed with spot sprays of glyphosate herbicide. Well timed mulch applications and mechanical (often hand) weeding is also supplemented. Inversely, the Display Garden areas primarily rely on mechanical removal of weeds and glyphosate herbicide spot sprays are used on a limited basis. Pre-emergent herbicides are used for Grounds and Display Garden bed areas that are difficult to manage, such as beds with groundcovers. Pre-emergent herbicides are not used in research and evaluation areas.

All animal pest management activities are performed to protect collections, visitors, and



staff with the least impact on the natural balance. Animal control activities are handled sensitively in a proper and legal manner. Animal control activities are done in co-operation with the Forest Preserve District of Cook County. Proper permits are obtained as needed.

All pest management at the Fruit and Vegetable Garden (FVG) follows the USDA's guidelines for growing organically. All of the same Plant Health Care / Integrated Pest Management methodology is applied at the FVG as reviewed above, except the pest management products chosen are Organic Materials Review Institute (OMRI) approved.

Fertilization

Fertilizers are used only as needed and are not used as automatic, routine blanket applications. Soil testing, foliar analysis, observation of nutrient deficiency symptoms, specific plant requirements, and field observations of plant performance guides the program. Both organic and synthetic fertilizers are used. Organic based fertilizers are primarily used; including refined sewage sludge such as Milorgantite. Selection and use is done with sensitivity toward leaching into non-target destinations, such as the Garden's lakes. Fertilizer used at the FVG is OMRI approved.

Pesticide Safety and Licensing

All pesticide use is performed in a safe and legal manner. PHC staff are licensed by the Illinois Department of Agriculture and trained by the PHC Supervisor before they may have any interaction with pesticides. All pesticide use is performed by PHC staff except in the areas managed by Aquatics, Native Habitats and Production Departments. Licensed Display Garden staff, approved by the PHC Supervisor, may apply glyphosate for weed management. All pesticide applications are written and electronically logged daily; and for safety purposes are available to be viewed by Human Resources and Security. Material Safety Data Sheet files are maintained.

Besides the PHC Department, pesticides and fertilizers are applied by the Aquatics, Native Habitat, and Production Greenhouse Departments. The PHC philosophy is practiced by these Departments. They must also be licensed, trained, and practice proper record keeping. The Aquatics Department applies algacides and herbicides to manage aquatic weeds. Native Habitats applies herbicides to manage undesirable plants. The Production Greenhouses applies insecticide, fungicides, and herbicides to protect their crops. The PHC Department compiles year end pesticide usage summaries for all areas and serves as a resource for training and consultation.

Pruning

Proper pruning is a proactive method that helps to maintain the health of a tree or shrub. The PHC Department focuses their winter pruning on special projects and the removal of plant parts to eliminate insect and disease problems. The PHC Supervisor is a Certified Arborist and serves as a resource for Garden wide pruning activities.

Education and Public Relations

The PHC Department's Plant Health Care Programs are models for the green industry and are often shared through various outlets. PHC staff teaches in-house for staff, as well as for



the School of the Botanic Garden and other speaking engagements. PHC staff serves as a Public Relations resource on topics of their expertise.

Goals

- Reduce the need for predictable fungicide and insecticide use by 5% yearly over the next 10 years by:
 - Replacing target plants that are known to have a high need for disease and insect chemical control with disease-free plants.
 - Preventing the introduction and accessioning of disease-prone plants.
 - Modifying garden maintenance to reduce disease (e.g. reducing overhead watering, decreasing plant density, and increasing distance between host plants).
 - Working toward more lenient acceptance levels of disease and insects in the Garden.
- Properly maintain the expanding and maturing tree collection of the Garden:
 - Add a working arborist to the staff within the next five years to maintain the Garden's trees, which are growing in size and number.
 - Develop and implement a five-year pruning rotation plan for all woody plants.
 - Develop tree care standards for planting, watering, pruning, mulching, and fertilizing and train the horticulture staff with these standards.
- Establish a compost program as a source for nutrients and soil amendments.

