

Connecticut College Landscape and Greenhouse Integrated Pest Management Policy V2

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Introduction

Pests are populations of living organism (animals, plants, or microorganism) that damage or interfere with desirable plants or aesthetics, or impact human or ecosystem health. Integrated Pest Management (IPM) is an approach that establishes a sustainable approach to managing pests by utilizing detailed knowledge of the pest organism's life cycle and ecology to intervene in the most effective and appropriate manner utilizing management tools that minimize economic, health and environmental risks.

As explained by the EPA IPM Principles Website (2017), IPM plans contain four main steps:

- **Monitor and Identify Pests**

Not all insects, weeds, and other living organisms require control. Many organisms are innocuous, and some are even beneficial. IPM programs work to monitor for pests and identify them accurately, so that appropriate control decisions can be made in conjunction with action thresholds. This monitoring and identification removes the possibility that pesticides will be used when they are not really needed or that the wrong kind of pesticide will be used.

- **Set Action Thresholds**

Before taking any pest control action, IPM first sets an action threshold, a point at which pest populations or environmental conditions indicate that pest control action must be taken. Sighting a single pest does not always mean control is needed. The level at which pests will either become a threat is critical to guide future pest control decisions.

- **Prevention**

As a first line of pest control, IPM programs work to manage landscape or indoor space to prevent pests from becoming a threat. Landscape management methods can be very effective and cost-efficient and present little to no risk to people or the environment.

- **Control**

Once monitoring, identification, and action thresholds indicate that pest control is required, and preventive methods are no longer effective or available, IPM programs then evaluate the proper control method both for effectiveness and risk. Effective, less risky pest controls are chosen first, including mechanical control, such as trapping or weeding; highly targeted chemicals, such as pheromones to disrupt pest mating. If further monitoring, identifications and action thresholds indicate that less risky controls are not working, then additional pest control methods would be employed, such as targeted spraying of pesticides. Broadcast spraying of non-specific pesticides is a last resort.

Plan Objectives

- Elimination of significant threats caused by pests
- Prevention of loss or damage of plant material by pests
- Protection of human health and environmental quality

Responsibilities and Reporting

IPM Coordinators

The Office of Facilities Management designee and the Arboretum Director will be the designated IPM Landscape Coordinators who are responsible for implementation of this IPM plan.

Pesticide Application

At least one staff member in both the Office of Facilities Management Grounds section and in the Office of the Arboretum should have a current State of Connecticut supervisory level pesticide applicator certification. All pesticide application records are to be overseen and archived by the certified individuals. Any contractors who apply pesticides to the campus landscape must comply with this IPM policy and have their written application proposals approved by the appropriate IPM Coordinator.

General IPM Strategies

Turf

Campus Lawn areas are not typically treated with pesticides. Insect, disease, and weed populations are kept at a minimum with the following best management practices:

- Frequent high mowing (2.5-3 inches) with mulching blades, no removal of cuttings
- Watering during dry spells in the early morning
- Aerating and topdressing to maintain drainage in high-traffic areas
- Application of organic matter to turf areas
- Minimal fertilization. Phosphorus-free fertilizer is used to reduce phosphorus runoff into nearby water bodies.
- Overseed turf areas with endophytic (pest resistant) grass seed in Spring and Fall.

Only the Freeman, Harkness and Knowlton athletic fields (total 5.26 acres), and the lawn areas in front of the library and the Gatehouse are treated with chemicals. Chemical treatment is reduced after weeds are controlled. Typically the athletic fields require two herbicide applications a year – one in early spring for crabgrass prevention, and one in late spring to control broad-leaved plants. Athletic fields are typically fertilized five times a year. The campus grounds supervisor may judge that fewer applications of herbicide or fertilizer are necessary in any given year, depending on the condition of the fields.

Arboretum turf areas, currently only in the Native Plant Collection (approx. 2 acres) follow these organic land care procedures:

- All mowing at 3-3.5 inches high with mulching blades, clippings remain
- All compostable organic matter from the arboretum and greenhouse (leaf clippings, weeds, etc.), in addition to two yearly truckloads from the Benham Ave. campus leaf piles, are placed in compost bins near the Arboretum garage and are mixed together
- Compost is turned over monthly and switched between three, large bins.
- Compost pH is periodically checked and lime mixed in as needed

- Compost is generally spread twice yearly, once in May and once in September on the Arboretum turf areas
- Soils beneath turf are tested annually for pH, nutrient and organic matter level
- Turf areas are aerated every six weeks from May to September
- Irrigation is only used for specific reasons, such as to restore turf on the Outdoor Theater stage or for establishing new turf.
- No herbicides, insecticides or fungicides are used.
- Beneficial nematodes utilized annually to control grubs.

Native Plant Collection areas between trees and shrubs are mowed approximately monthly during the growing season. Selective herbicides are used on an approximately three year cycle to control aggressive invasive woody plants that are not kept in check by the mowing.

Gardens/Perennial Beds

Campus garden bed and weed control methods are:

- Wood chip mulching in spring
- Planting rapidly growing species in sufficient quantities to ensure thorough coverage
- Hiring extra (less costly) summer help
- Converting areas that are hard to maintain into easily mowed lawn areas
- Using herbicides only when absolutely necessary, and choosing the least toxic and non-residual option.
- Cut back perennials in late fall.

Arboretum Garden/Perennial maintenance guidelines are:

- No deadheading. Let flowers go to seed—unless there are too many of that particular species. Another exception: perennials that give a second flush of bloom may be deadheaded or cut back early in the season. A second period of bloom should be encouraged. Then let the seed develop. Seed heads should be left on the plants all winter for wildlife.
- Don't cut plants down in the fall or as soon as they start fading. Leave all plant debris in place at the end of the growing season. Exception: certain plants, for example, iris benefit from the removal of infected foliage. This can be handled on a case by case basis.
- Spring clean-up. Cut back dead foliage from perennials and ornamental grasses in early spring (usually during March and early April). Chop up debris and leave on the ground as mulch. Rake the debris into a row at the edge of the bed and go over it with a mulching mower. Then rake it back into the planting bed. Without a practical means to chop debris, shredded leaves may be used for mulch, as necessary.
- No bare soil. Bare soil is an invitation to weeds which translates to higher maintenance. Plants should be spaced so they fill in bare areas quickly after installation. Soil should be covered year round to suppress weeds and retain moisture and organic matter. Do not clean up debris like leaf litter, unless it accumulates too thickly and causes problems. A healthy soil maintains its rich microbial life by recycling debris wherever it falls to the ground. If the look of leaf litter is problematic consider using shredded leaves or local leaf compost as a light mulch layer in the planting.

- Minimize wood chips. If mulch is still needed to cover bare soil after following the above steps, mulch lightly with 1 inch of local leaf compost or shredded leaves. Keep mulch away from crowns of plants and off exposed rhizomes (Iris). If wood chips must be used never apply more than 1 inch and keep a bit back from plants.
- Weed by Hand.

Woody Plants

The vast majority of trees and shrubs are maintained without chemical controls. Tree maintenance guidelines are:

- Carry out pruning on a regular basis to remove dead and diseased limbs.
- Remove diseased plants and replant with resistant varieties.
- Decisions whether to remove plants or to use pesticides should take into account the relative importance of the species to the Connecticut College Arboretum plant collections. Consultation with the Arboretum Director and Curator should precede any actions.
- Once pests reach the action threshold, use the least toxic, but effective, pesticides such as horticultural oils, soaps and other “organic” methods first.
- Make applications of chemical controls at times of the year and with the application techniques which will be most effective.

Invasives

Connecticut College adopted the following Invasive Plant Policy in 2005:

Invasive plants are defined as those plants that escape from cultivation, or their original location, and spread relatively rapidly without human assistance. Spread may be by vegetative or sexual reproduction. These plants are usually exotic, non-native species, although this depends on the definition of native.

It is the intention to manage invasive plant populations with the goal of complete eradication when possible and practical, and of maintaining low, controlled levels of invasives if eradication is not practical.

Implementation of the policy is based on the following considerations:

1. Location of the infestation – removal from cultivated landscape settings is a higher priority than minimally managed or wild locations.
2. Invasiveness of the species – Plants known to be extremely invasive are a higher priority.
3. Resources available – Invasive removal is often very labor intensive and the limitations of staff numbers and budget levels must be considered.

An Integrated Pest Management approach will be used in invasive plant management. Control procedures will be based on an understanding of species biology and ecology, and mechanical and “organic” methods will be evaluated before herbicides are used.

Herbicides will be used in strict conformity with state and federal law. Only the most selective herbicide application technique that is deemed effective, and the lowest effective concentration of chemical, will be used.

Since our natural areas have been the location of long term ecological research for many decades, some of which monitor the spread of invasive plants, invasive plant control must occur on a case by case basis, and include consultation with faculty who may utilize the area in question for research or teaching.

Greenhouse Pest Control

- Sticky cards are hung up year round to trap and monitor insect populations.
- Visual surveys are done during watering to monitor for pest outbreaks.
- After an outbreak is discovered, insecticides are generally used once a week until pest population is below action levels.
- Insecticides generally used are soybean oil, horticultural oil, Neem oil, Safer soap (rotate throughout, don't use any one continuously). Beneficial nematodes and insects may also be used.