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Overview

The Brandeis University Integrated Pest Management (IPM) Plan is a prevention-based strategy that provides a comprehensive, ecosystem-based approach focusing on long-term pest control, improved building conditions through a combination of properly timed techniques (biological control, habitat manipulation, and modification of cultural practices) and the use of resistant varieties to create healthier conditions for residents, faculty, staff, visitors and pets.

This strategy also uses small amounts of organic and/or approved pesticides to minimize pest quantities only after monitoring indicates they are needed. Treatments are undertaken with the goal of controlling only target organisms to an acceptable level in specific areas. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial non-targeted organisms and the environment while protecting landscape aesthetics.

The foundation of this pest management program is on preventative, non-chemical and cultural/mechanical measures for control. Any time a pesticide is applied to campus proper notification will be posted when required.

This IPM Plan contains overall pest management strategies as well as more detailed pest strategies and procedures for indoor pests, outdoor pests and athletic field pests.

A. Principals of IPM include:

- Identify pest problems through monitoring and inspection
- Block pest entry points
- Remove pest's food, water and shelter
- Use low-toxicity, low-risk pesticides only as needed
- Comply with relevant state regulatory requirements

B. Benefits of this IPM program include:

- A reduction or removal of pest and/or rodent allergens, leading to a reduction in asthma causes and triggers
- Better pest control, leading to fewer pest work orders and pest-related complaints
- Reduced exposure to hazardous chemicals
- Improved health and living conditions for students and staff
- Reduced pest-control cost over time

1. Roles and Responsibilities

- Director of Facilities Services – Approves the IPM program and presents to leadership IPM program and goals.
- Grounds and Fleet Manager – Develop, update and implements the IPM program and monitors results. Decides on approaches to take when a pest becomes a problem. Is the point of contact for outside pest management contractor; currently Ultrafast pest control.
- Grounds Staff – Monitors campus grounds for pest activity on a regular basis, and reports instances to Grounds and Fleet Manager. Maintains grounds in an approved manner in order to prevent pest activities.
- Horticulturalist – Applies pesticides to campus grounds, under direction of the Grounds and Fleet Manager.
- Maintenance Staff – Maintains a sanitized environment in areas they care for. Responds to work orders requesting sealing pest access points. Notifies supervisors of pest occurrences.
- Director of Sustainability – Aids in the education of students of IPM implementation and steps they can do to help. Advises Grounds and Fleet manager when applicable.
- Director of Capital Planning – Works with the Grounds & Fleet Manager to implement an IPM program during building renovations and construction in order to prevent future pest activities or intrusion.
- Brandeis Staff and Students – Keeps their living/working area clean and clutter free. Reports sightings of pests through the service request system.
- Pest Management Contractor – Responds to pest activities through the work order system.

2. IPM Program Steps

There are ten main steps within the IPM program that are utilized throughout campus to determine if current pest-management practices are consistent with IPM pest-prevention treatments and services.

1. Regular Inspection and Monitoring – Regularly documenting current pest problems, potential future issues, maintenance needs, and appropriate treatment through the work order system. Regularly schedule inspections through the quality control program that identifies evidence of pest, pest entry points, and cleaning, maintenance or trash management issues
2. IPM Plan and Record Keeping System – Identify focus pest and pest-conductive areas, and ongoing monitoring needs. Recommending responses based on pest population/locations. Using a recordkeeping system that enables owners and managers to track target areas.
3. Pest-specific Control Protocols – Establish clear procedures by emphasizing non-pesticide methods that deprive pest of food, water and shelter to minimize resident's exposure to pesticides.
4. Limited/Targeted Pesticide Use - Clearly prohibiting routine pesticide use and identifying appropriate uses of pesticide.
5. Integration with Maintenance Activities – Establish a clear process to request maintenance repair to seal holes and cracks, manage trash, minimize moisture, or other pest prevention activities.
6. Integration with Renovation & Construction Projects – Look for opportunities to prevent future issues by fixing leaks and moisture problems, sealing cracks and holes, and using pest-resistant materials during capital improvement projects.
7. A written IPM policy or procedures – Establish clear expectations for pest control consistent with IPM practices and ensuring practices are supported by leadership.
8. An IPM trained/Certified Pest Professional – Using licensed pesticide applicators with appropriate certification. Human Resources and the Manager of Grounds and Fleet has copies of pesticide licenses for Brandeis Employees. The pest control contractor has copies of pesticide licenses for their employees.
9. Define Roles on the IPM Team – Coordinating pest prevention and treatment activities among Brandeis, Facilities and Grounds employees.
10. Education & Engagement – Providing students and staff with information to minimize pest problems throughout campus

3. Current practices

Year-round activities generally include:

- Grounds staff monitor for pests as they patrol and work on campus, reporting pest activity to the Grounds Manager. A mechanical, biological or chemical approach is chosen to bring the number of pests to a level which doesn't add economical damage or affect human health.
- Garden beds are mulched annually with 2" of aged hemlock mulch which aids in weed suppression.
- Most weeds in tree and plant beds are manually pulled and discarded.
- Outside contractor is on campus 3 or more times per week responding to indoor pest occurrences through the work order system and monitoring for pest occurrences.

4. Goals for FY2022

- Reduce the use of any products containing glyphosate (N-(phosphonomethyl) glycine) by mechanically pulling weeds utilizing student volunteers, applying pre-emergent herbicides and evaluating other alternatives.
- Evaluate irrigation controls to adequately irrigate lawns and beds to reduce disease instances.
- Identify opportunities for organic fertilizers and reduced herbicide applications.
- Develop a plan to perform baseline inspections on all campus buildings every 5 years.

5. Inspection Process

- Semi-Annual Inspections will occur throughout the campus grounds by the Manager of Grounds and Fleet in the second half of March and August, weather dependent.
- Quality Assurance Coordinator and Grounds and Fleet Manager will monitor areas indoors and/or outdoors monthly by way of monthly quality assurance inspections.
- Horticulturalist will inspect areas before and after any treatment has been made to lawns and landscape beds to evaluate the treatment's effectiveness.
- Pest Management contractor will inspect indoor areas before and after any treatment has been made to evaluate the treatment's effectiveness.
- The IPM Plan will be updated by the Grounds Manager yearly during the month of January and reviewed/approved by the Facilities Services Director.
- The IPM Plan will be placed on the Facilities website for all students, staff and vendors to review and follow once updated and approved.

6. Pesticide Use

Everyone applying pesticide will adhere to the following rules for pesticide use:

1. Legal Products and Use: pesticide must be legal for use in the State of MA, approved by the Brandeis Grounds Manager and applied in accordance with label directions.
2. Approved Products: Apply only pesticide products that have been included in the IPM Plan and approved in writing by the Grounds and Fleet manager or Director of Facilities Services
3. Prohibited:
 - a. Indoor foggers or “bug bombs”
 - b. Organophosphate or chlorinate hydrocarbons pesticides
 - c. Baseboard spray applications
4. Pesticide Storage: Do not store any pesticide products in the building, as specified in the contract
5. Application by Need: Apply pesticides according to need and not by schedule. Do not apply pesticides inside or in outside areas unless visual inspection, monitoring devices, or documented site history indicate the presence of pests in that specific area and in excess of actionable levels specified.
6. Minimization of Risk: When pesticides are necessary, use the least-hazardous materials, with the most-precise application technique, and with the minimum quantity of pesticide necessary to achieve control. Apply pesticides in a manner that limit exposure to residents and pets.
 - a. Additional information on pesticide safety can be found at:
 - i. EPA Pesticide Program – <https://www.epa.gov/pesticides>
 - ii. Mass. Department of Agricultural Resources – <https://www.mass.gov/orgs/massachusetts-department-of-agricultural-resources>
7. Notifications: Notifications will be provided according to label. Outdoor notifications will include posting of yellow “pesticide applied” signs and area to be treated. Indoor notifications may include speaking with occupants of treated rooms, providing a door tag with tasks performed and responding in the work order system for tasks taken and if follow-up is needed.

If situations progress to requiring other pesticides or more invasive procedures a meeting will be held with Brandeis Management and Ultrafast Pest Control management about notification procedures dependent on action taken.
8. Emergency Procedures: In case of emergency situation, request written approval from the Grounds and Fleet Manager if it is necessary to vary from the above procedures.

7. Record Keeping

- All turf and landscape pesticide applications will be recorded and stored in the maintenance garage for at least 5 years.
- A recording of pest instances will be kept to identify problem areas.
- A spreadsheet of pest related work orders will be kept and updated on a weekly basis to monitor and identify recurring issues.
- Safety Data Sheets (SDS) of all pesticides used on campus will be kept electronically and in paper at the maintenance garage.

8. Education/Tips for Building Occupants

- Residence Halls
 - Keep food in sealed containers
 - Vacuum and dust
 - Check window screens for tears and submit a service request for repair if needed
 - Pick up clutter
 - Clean dirty dishes
 - Avoid standing water of any kind
 - Take out trash, recycling and compost and put inside appropriate containers, not on the ground
 - Keep areas of your room accessible for pest control to inspect and treat areas of concern when needed
- Office and Classroom spaces
 - Keep food in sealed containers
 - Be sure waste goes inside appropriate containers
 - Keep an organized area
 - Clean dirty dishes in kitchen areas
 - Submit a service requests for missing/ripped screens, cracks and crevices and walls and missing door thresholds.

9. Pest Management Opportunities During Renovations/Construction

- Prior to building renovations which include taking down walls, removing drywall, removing flooring and removing ceilings, Manager of Grounds & Fleet and the pest management contractor should be contacted to assess if additional pest control measures should be taken.
- During building renovations, the pest management contractor should be notified to inspect and treat areas not typically accessible.
- After building renovations the pest management contractor should be notified to inspect and treat areas as needed and to address and new pest access points which may have been created.
- Prior to new construction, Manager of Grounds & Fleet and the pest management contractor should be contacted to assess the need for additional monitoring and treatment for areas surrounding the construction area due to disturbing the construction area.
- During construction the pest management contractor should be on site regularly to monitor for pests before they become a problem.
- After construction the pest management contractor should be notified to inspect the building for potential access points before pests can gain entrance.

10. Outdoors & Turf

A. Common pests

The most common, known pests outdoors on landscaping, plants and turf are listed below and will be updated as new pests are observed.

Turf pests	Landscaping and plant pests	Other outdoor pests
Weeds: <ul style="list-style-type: none"> ● Crabgrass ● White Clover ● Dandelion ● Yellow Nutsedge Insects: <ul style="list-style-type: none"> ● Grubs ● Chinch Bug 	Weeds: <ul style="list-style-type: none"> ● Crabgrass ● Tree of Heaven ● Spurge ● Crabgrass ● Yellow Nutsedge 	Pests <ul style="list-style-type: none"> ● Bees and Wasps ● Geese ● Mosquitoes

B. Current pesticides used

Trade Name	Chemical	Timing	Pest Controlled	Signal Word
Wasp Freeze	Prallethrin	Postemergent	Wasp, Hornets and Bees	Caution
Dimension	Dithiopyr	Preemergent	Crabgrass	Warning
Q4	Quinclorac, Sufentrazone, 2,4-D, Dicamba	Postemergent	Crabgrass, Broadleaf Weeds, Nutsedge	Caution
Roundup	Glyphosate	Postemergent	Non-selective, all weeds	Caution
Acelepryn	Chlorantranilliprole	Preemergent	White Grubs, Chinch Bugs	None
Confront	Triclopyr Clopyralid	Postemergent	Broadleaf weeds	Danger
Crew	Isoxaben Dithiopyr	Preemergent	Grassy and Broadleaf Weeds	Caution

C. Landscaped Priority Areas and Standards

The campus is divided into 4 priority areas dictating how we care for the grounds and landscape in those areas. The 4 areas are *Improved*, *Semi-Improved A*, *Semi-Improved B*, and *Naturalized*. Pesticide use is different in each of the 4 areas. Below is a table differentiating the use of different pesticides in each priority area.

	Improved	Semi-Improved A	Semi-Improved B	Naturalized
Summary	Maintained to Brandeis University's highest standards. Most prominent areas and requires the most inputs.	Second level of Brandeis University's standards. Less curative pesticide use, due to higher thresholds.	Third level of Brandeis University's standards. Only preventive use of herbicides and insecticides.	Area at Brandeis University which has been planted or developed to be a minimal to no input area.
Herbicide use	Used preventatively for crabgrass. Used curatively if weed presence is greater than 5%. Used preventatively in garden beds.	Used preventatively for crabgrass. Used curatively if weed presence is greater than 15%. Used preventatively in garden beds.	Used preventatively for crabgrass.	None used
Insecticide use	Used preventatively for grubs. Used curatively if insect is at risk to kill at least 15% of grass or plant	Used preventatively for grubs.	Used preventatively for grubs	Only used for safety (bee/wasp/hornet nest near walkway or access point)
Fungicide use	Only used if disease is a risk to kill at least 15% of grass or plant.	None used	None used	None used
Areas to reduce use	Evaluate raising threshold before using curative pesticide	Evaluate raising threshold before using curative pesticide. Evaluate the need for preventative grub control.	Evaluate the need for preventative grub and crabgrass control	None

D. Maintenance Levels and Standards

Below are the standards we aim to uphold in each area along with a map detailing each priority area.

Grounds Standards				
	Improved	Semi Improved A	Semi Improved B	Naturalized
Grass Height	3-4.5"	3.5-5"	4-6"	Not applicable
Turf Care (mowing practices,	Straight lines, no grass clumping <5% weed presence throughout lawn. Grass discharged away from garden beds, signs and air intakes.	Straight lines, no grass clumping <15% weed presence throughout lawn. Grass discharged away from garden beds, signs and air intakes	Straight lines, no grass clumping. Grass discharged away from garden beds, signs and air intakes.	Not applicable
String Trim	Completed same day as mowing around trees, buildings, signs, walkways and other needed areas. Garden beds line trimmed with clean edge	Completed same day as mowing around trees, building, signs, walkways and other needed areas.	Completed same day as mowing around trees, building, signs, walkways and other needed areas.	Around Hydrants and access points monthly
Hardscapes (walkways, sidewalks, stone walls)	Hardscapes blown off same day as mowing. No grass or mulch on hardscapes after mowing. Anything damaged causing a safety issue reported to grounds manager.	Hardscapes blown off same day as mowing. No grass or mulch on hardscapes after mowing. Anything damaged causing a safety issue reported to grounds manager.	Hardscapes blown off same day as mowing. No grass or mulch on hardscapes after mowing. Anything damaged causing a safety issue reported to grounds manager.	Blown off bi-weekly. Any damage resulting in a safety issue reported to grounds manager.
Garden Beds	Mulched with >2" mulch <5% weed coverage throughout garden bed. No weeds taller than 3" No Tree limbs. Grass clippings blown away from beds.	Mulched with >2" mulch <15% weed coverage throughout garden bed. No weeds taller than 5" No Tree limbs. Grass clippings blown away from beds.	Mulched every other year <30% weed coverage throughout garden bed. No weeds taller than 8". Grass clippings blown away from beds	Not applicable
Trash Barrels	Trash barrels picked up M-F during school year. 3x per week during summer	Trash barrels picked up M-F during school year. 3x per week during summer	Trash barrels picked up M-F during school year. 3x per week during summer	No barrels
Loose Trash	No trash that has been mowed over No trash on ground longer than 24 hours	No trash that has been mowed over No trash on ground longer than 24 hours	No trash that has been mowed over No trash on ground longer than 24 hours	Loose Trash picked up weekly.
Shrubs	Trimmed once per year and for clearance as needed. Dead branches removed	Trimmed for clearance as needed. Dead branches removed.	Trimmed for clearance as needed. Dead branches removed.	Trimmed for clearance as needed. Dead branches removed.
Trees	Trimmed for clearance and health. Good branches only removed for clearance or shape. Dead branches and trees removed or reported to Grounds Manager.	Trimmed for clearance. Healthy branches only removed for clearance. Dead branches and trees reported to Grounds Manager	Trimmed for clearance. Healthy branches only removed for clearance. Dead branches and trees reported to Grounds Manager	Trimmed for clearance. Healthy branches only removed for clearance. Dead branches and trees reported to Grounds Manager
Signs/Posts/Fence/Barricades	Broken signs, posts, fences and barricades reported to grounds manager. Any faded signs reported to grounds manager. Sign posts without signs reported to grounds manager for replacement.	Broken signs, posts, fences and barricades reported to grounds manager. Any faded signs reported to grounds manager. Sign posts without signs reported to grounds manager for replacement.	Broken signs, posts, fences and barricades reported to grounds manager. Any faded signs reported to grounds manager. Sign posts without signs reported to grounds manager for replacement.	Broken signs, posts, fences and barricades reported to grounds manager. Any faded signs reported to grounds manager. Sign posts without signs reported to grounds manager for replacement.
Irrigation	Operating uniformly. No broken heads.	Operating uniformly. No broken heads.	Not applicable	Not applicable
Moveable objects (Furniture, cigarette towers)	All moveable objects will be placed in useable locations after an area has been mowed. Furniture broken beyond use or unsafe will be reported to grounds manager.	All moveable objects will be placed in useable locations after an area has been mowed. Furniture broken beyond use or unsafe will be reported to grounds manager.	All moveable objects will be placed in useable locations after an area has been mowed. Furniture broken beyond use or unsafe will be reported to grounds manager.	Not applicable
Vandalism	Any vandalism reported to grounds manager.	Any vandalism reported to grounds manager.	Any vandalism reported to grounds manager.	Any vandalism reported to grounds manager.
Pests	Report Bees nests, rodent activity in grounds and hardscapes, grub activity (skunk and crows digging at grass)	Report Bees nests, rodent activity in grounds and hardscapes, grub activity (skunk and crows digging at grass)	Report Bees nests, rodent activity in grounds and hardscapes, grub activity (skunk and crows digging at grass)	Report Bees nests, rodent activity in grounds and hardscapes, grub activity (skunk and crows digging at grass)

F. Process before and after using an approved curative pesticide

- Monitor for pest activity
- Identify the pest and understand its life cycle and habits
- Attempt to restrict the pest from the area
- Perform general cultural practices such as aeration, appropriate irrigation usage, proper mowing
- Approved Preemergent herbicides and insecticides have been applied according to the grounds management plan.
- Mechanical and manual removal of weed or pest has been evaluated and/or attempted
- Curative pesticide selected by the Grounds Manager and applied by a licensed pesticide applicator.
- Record pest instance and impact, action taken and any pesticides used and rates.

G. Guidelines for considering appropriate pesticide to use

Brandeis shall use the following criteria for selecting pesticide:

- a) Least hazardous to people based upon signal word. In order from least toxic to most toxic is Caution, Warning, Danger.
- b) Most species-specific
- c) Greatest need for ongoing use and maintenance of field or facility
- d) Highest level of anticipated effectiveness
- e) Lowest cost

H. Pesticide application

Only licensed pesticide applicators both employed by Brandeis or as an outside contractor may apply pesticides on the Brandeis University campus.

I. Notification

When pesticide applications are scheduled on campus, the grounds team provides notification by placing yellow pesticide signs on entrance points to areas to be treated and leaving signs up for no less than 24 hours and no longer than 72 hours.

11. Indoors

Indoor pests are controlled by an outside contractor, currently UltraFast Pest services. They are specialized in pest control in high use facilities such as other universities and hospitals. All of their pesticides and rodenticides are approved for use at Brandeis University residential and non-residential areas per their label. All UltraFast Pest employees which come to campus have completed a background check through Brandeis University. Prior to entering any building UltraFast Pest services will sign in with facilities and respond to and follow up on pest related work orders.

A. Common Pests

- Mice
- Ants
- Bees/Wasps/Hornets
- Roaches
- Spiders

B. Current Pesticides and Rodenticides Used

Trade Name	Chemical	Pest Controlled	Signal Word
Maxforce granular bait	Hydramethylnon	Ants, Roaches other crawling insects	Caution
Maxforce Ant Gel	Fipronil	Ants	Caution
Maxforce Roach Gel	Fipronil	Roaches	Caution
Wasp Freeze	Prallethrin	Wasp, Hornets and Bees	Caution
Contraac all-weather blox rodenticide	Bromadiolone	Mice, Rats, Voles	Caution
Final soft bait rodenticide	Brodifacoum	Mice, Rats, Voles	Caution
Tempo WP	Cyfluthrin	Crawling, Flying and Wood infesting insects	Caution

C. Process before and after using an approved pesticide

- a) Properly identify the pest in question.
- b) Investigate the possibilities of dealing with a pest with a non-chemical approach such as setting traps, sealing access points, removal of desired food source, proper sanitation practices and closing of building and room doors.
- c) If pesticide application is required follow the label to assure no health issues.
- d) Ultrafast Pest control will properly post areas of treatments when required by law and the label.

12. Athletic Fields

The athletic fields are maintained at a different level than the rest of the campus. The athletic fields have a grass species which requires a lower height of cut. This lower height of cut combined with the need to keep consistent turf cover for athlete safety require more pesticide and fungicide applications preventively.

A. Common Pests and Diseases

Turf insects	Turf Weeds	Turf Disease	Other Pests
Insects: <ul style="list-style-type: none"> ● Grubs ● Chinch Bug 	Weeds: <ul style="list-style-type: none"> ● Crabgrass ● Goosegrass ● White Clover 	Diseases: <ul style="list-style-type: none"> ● Brown Patch ● Dollar Spot ● Pythium Blight 	Pests: <ul style="list-style-type: none"> ● Geese

B. Current herbicides and pesticides used

Trade Name	Chemical	Type of Pesticide	Pest Controlled	Signal Word
Dimension	Dithiopyr	Herbicide	Crabgrass	Warning
Q4	Quinclorac, Sufentrazone, 2,4-D, Dicamba	Herbicide	Crabgrass, Broadleaf Weeds, Nutsedge	Caution
Roundup	Glyphosate	Herbicide	Non-selective, all weeds	Caution
Acelepryn	Chlorantranilliprole	Insecticide	White Grubs, Chinch Bugs	None
Confront	Triclopyr Clopyralid	Herbicide	Broadleaf weeds	Danger
Enclave	Chlorothalonil Iprodione Thiophanate-methyl Tebuconazole	Fungicide	Turf Diseases (Brown Patch, Anthracnose, Dollar spot)	Caution
Union	Cyazofamid Azoxystrobin	Fungicide	Turf Diseases (Pythium, Anthracnose, Brown Patch)	Caution

C. Process before and after using an approved curative pesticide

- Monitor for pest activity
- Identify the pest and understand its life cycle and habits
- Attempt to restrict the pest from the area
- Perform general cultural practices such as aeration, appropriate irrigation usage, proper mowing
- Approved Preemergent herbicides and insecticides have been applied according to the grounds management plan.
- Mechanical and manual removal of weed or pest has been evaluated and/or attempted
- Curative pesticide selected by the Grounds Manager and applied by a licensed pesticide applicator.
- Record pest instance and impact, action taken and any pesticides used and rates.

13. Resources

- National Pesticide Information Center - <http://npic.orst.edu/factsheets/signalwords.html>
- Massachusetts Pesticide Regulations - <https://www.mass.gov/service-details/pesticide-regulations-in-massachusetts>
- Smarter Pest Control - <https://smarterpestcontrol.com/blog/7-ways-keep-pests-dorm-room/>
- Campus species map - [iNaturalist](#) - platform to observe various species on campus. This is the most comprehensive record we have of our campus ecosystem.