



INTEGRATED PEST MANAGEMENT PLAN

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INTRODUCTION

Integrated Pest Management (IPM) is a pest management system that utilizes all suitable techniques to prevent pests from reaching unacceptable levels or to reduce an existing population to an acceptable level. An emphasis is placed on manipulation of the pest environment to the point that it will not support a pest population.

ONLY QUALIFIED INDIVIDUALS MAY APPLY PESTICIDES ON HOPE'S CAMPUS.

PLEASE READ THIS MANUAL CAREFULLY AND FOLLOW APPROPRIATE PROCEDURES BEFORE MAKING ANY PESTICIDE APPLICATIONS AT THIS FACILITY.

Be advised that violations of Michigan's pesticide use laws are misdemeanor offenses and are punishable by administrative fines of up to \$1,000 per count, or, upon a conviction in a court of law, may be punishable by fines of up to \$5,000 per count and/or imprisonment. Be advised that the Michigan Department of Agriculture and Rural Development (MDARD) is the enforcing agency for pesticide use requirements and MDARD may conduct routine unannounced inspections to verify compliance with IPM requirements.

This IPM program is intended to help reduce the incidence of pest infestation and to reduce the need for chemical pesticide applications at all campus buildings.

ACRONYMS USED IN THIS PROGRAM INCLUDE:

| | |
|--------------|---|
| IPM | INTEGRATED PEST MANAGEMENT |
| EPA | ENVIRONMENTAL PROTECTION AGENCY |
| MDARD | MICHIGAN DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT |
| PA | PUBLIC ACT |

KEY TERMS

Certified Applicator: A person authorized to use and supervise the use of a restricted use pesticide. You must receive a passing score on one or more certification exams administered by MDARD to become a certified applicator.

Commercial Applicator: A person who is not a private agricultural applicator (i.e., a farmer, or someone growing a crop for an agricultural purpose) and who meets one of the following conditions:

- a) who is required to be a registered technician or certified applicator under this part (see note below).
- b) who uses or supervises the use of restricted use pesticides.
- c) who holds themselves out to the public as being in the business of applying pesticides.

Note: PA 451, section 8314 requires a person to be a certified applicator to apply any pesticide (other than a sanitizer, disinfectant, bactericide or general-use ready-to-use product), other than for a private agricultural purpose, in the course of their employment.

Commercial Building: Any portion of a building that is not a private residence where business is located and that is frequented by the public.

Concentration: The volume of pesticide formulation and the volume of carrier used to create an end use dilution.

General Use Pesticide: A pesticide that may be purchased by an individual who is not required to be a certified applicator.

Integrated Pest Management: A pest management approach that uses all suitable techniques in a total management system to prevent pests from reaching unacceptable levels or to reduce existing populations to acceptable levels.

Pest: An insect, rodent, nematode, fungus, weed, or other form of terrestrial or aquatic plant or animal life or virus, bacteria, or other microorganism, or any other organism that the director of the MDARD declares to be a pest under PA 451, Part 83, Section 8322, except viruses, fungi, bacteria, nematodes or other microorganisms in or on living animals.

Pesticide: A substance or mixture of substances intended for preventing, destroying, repelling, or mitigating pests or intended for use as a plant regulator, defoliant, or desiccant. Note that products such as Weed-and-Feed, RoundUp, or Raid are pesticides.

Ready-To-Use Pesticide: A pesticide which is applied directly from its original container consistent with label directions, such as an aerosol insecticide or rodent bait box, which does not require mixing or loading prior to application. Granular weed-and-feed products applied using rotary or drop spreaders are NOT considered to be ready-to-use and for nearly all situations an applicator applying the product as part of their non-agricultural work duties must be certified to use it.

Registered Applicator: A classification of applicators authorized to apply general use pesticides for a commercial or private purpose as a scheduled and required work assignment.

Threshold Level: The level of pest numbers or pest infestation that can be tolerated.

ADMINISTRATION

REGULATIONS

Laws concerning pesticide use in schools, day care centers, public buildings, and medical care facilities can be found in:

Public Act 451 of 1994, Part 83, Pesticide Control

Regulation 636, Pesticide Applicators

Regulation 637, Pesticide Use

These laws can be downloaded from the Michigan Department of Agriculture and Rural Development (MDARD) web site located at www.michigan.gov/mdard. Type the appropriate Act or Regulation into the search engine and follow the links to get a copy, or you may contact MDARD at 800-292-3939.

COMMUNICATION – SIGHTING LOG

Proper implementation of an Integrated Pest Management (IPM) program requires careful administration. It is important for the building manager and administrative staff to communicate with the pesticide applicator(s) to ensure full implementation of the IPM program. To meet this goal, accurate recordkeeping data will be used as part of the communication process. The building manager will ensure that pest sightings are recorded in the Physical Plant work order system.

APPLICATOR CREDENTIALS

Outside contractors who conduct pesticide applications on campus, other than use of a sanitizer, germicide, disinfectant or antimicrobial agent, must be **licensed** and **certified**.

Persons who are employees of the College and who have obtained training may use a *general-use ready-to-use product* (see definitions section) in compliance with State of Michigan regulations without being certified or registered. However, whenever possible, pesticide applications should be conducted by the person responsible for pest control in this facility or by a licensed and certified professional applicator.

Persons who use a pesticide product at this facility which is NOT ready-to-use, other than a sanitizer, germicide, disinfectant, or antimicrobial agent, **must** be a commercially certified or registered pesticide applicator. Examples of situations where the applicator must be commercially certified or registered include:

- When pesticides are mixed and applied from a compressed air sprayer such as a hand-can or backpack sprayer.
- When pesticides such as weed-and-feed are put into a granular spreader, such as a lawn weed-and-feed spreader, for application.

PESTICIDE APPLICATIONS AND PERSONAL PROTECTIVE EQUIPMENT

Pesticide applications for non-emergency situations shall only be conducted by an applicator who has completed their IPM training and shall be made in accordance with this IPM program. Applications must be made in a manner that is consistent with the pesticide label directions, as required by State and Federal law. The applicator shall use personal protective equipment that is appropriate relative to the potential exposure and as required by the pesticide label. Persons who apply pesticides at this facility, other than general-use ready-to-use pesticides are commercial pesticide applicators. Minimum personal protective equipment for commercial pesticide applicators includes long pants, protective footwear, gloves that are impervious to the pesticide being applied (when contact with the hands is likely), and long-sleeve clothing. Short-sleeve clothing may be worn if soap and water is immediately available and a long-sleeved shirt is not required by the pesticide label.

PESTICIDE APPLICATION RECORDS

Records will be maintained within the Physical Plant work order system or by the licensed and certified professional pesticide applicator. Records shall contain at least the following information:

- Site address and the location of the areas or room(s) where pesticides are applied.
- The date of service.
- The target pest(s).
- An inspection report and the conditions conducive to pest infestation.
- Pest management recommendations made by the applicator, such as structural or habitat modification.
- Structural or habitat modifications or other measures initiated as a part of the IPM program.
- The brand name, EPA registration number, concentration and total amount of pesticide(s) used.
- The name of the applicator.
- The method and rate of application.

ADVANCE NOTICE OF PESTICIDE USE

Advance Notice of Pesticide Use must be delivered at least 72 hours prior to the anticipated treatment. The notice may be sent via email or posted at a public location in the building.

The Notice shall contain the following information:

- A statement that a pesticide is expected to be applied.
- The target pest(s).
- The approximate location of the application.
- The date of the application

In the event of the need for emergency applications, notice must be made within 24 hours of application. This does not include use of least toxic pesticides. An emergency is defined by any infestation that is currently or will soon result in building damage or is an immediate health concern to building occupants.

IPM PROGRAM EVALUATION

The IPM program shall be evaluated on a continual basis to determine the program's effectiveness and the need for program modification. The IPM program should contain the initial site evaluation and a continual record of inspections and pesticide applications. These documents can be evaluated to determine the success of the IPM program. If the evaluation does not indicate improvement or continuation of an acceptable pest level, then the IPM program should be revised to reach an acceptable level of pest control.

POSTING

When making an application of pesticides, *other than a general-use ready-to-use pesticide*, a commercial applicator shall place the appropriate signs or markers at the primary point or points of entry.

Indoor Insecticide Applications

The primary point or points of entry must be posted with the appropriate signs. Postings shall remain for at least 48 hours after the most recent application of insecticide. Posting signs must be in compliance with Regulation 637, Rule 11(4). Signs shall be at least 2 ½ inches square and shall depict a house surrounded by a cloud. The date shall be placed on the sign. See the rule for additional details on sign requirements. Please note that treatments using a general-use ready-to-use product are exempt from the posting requirement. The posting should be similar to the item depicted in illustration #1 or #2 below.

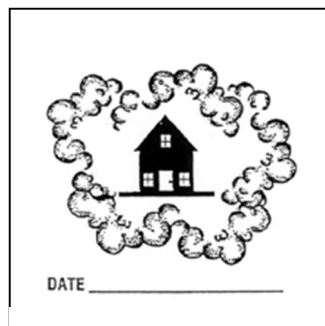
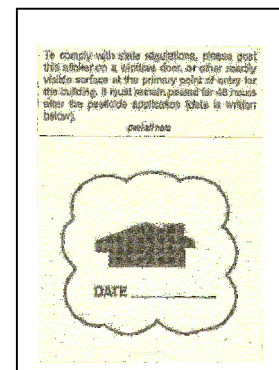


Illustration #1



Ornamental or Turf Applications

The primary point or points of entry must be posted. Postings shall remain at least 24 hours. Postings will be in compliance with Regulation 637, Rule 11(2). Signs shall be at least 4" high by 5" wide and shall depict a picture of an adult and child walking a dog on a leash. The illustration shall depict, using a diagonal line across the circle, that this action is prohibited. See the rule for additional details on sign requirements. The sign must be in compliance with the requirements of Regulation 637, Rule 11(2). It will look similar to the sign shown below, with the sign having the same information on both sides of the sign.



PEST MANAGEMENT STRATEGY AND PEST BIOLOGY

STRATEGY

This IPM program involves the use of available methods or strategies to control pests including inspection, sanitation, exclusion, reservoir reduction, harborage reduction and population reduction.

1. Inspections and pest population monitoring refers to a regularly scheduled program of building and site inspections limit the need for emergency pesticide applications.
2. Sanitation refers to a reduction of the food and water resources that are attractive to pests. By minimizing the resource of food and water available to the pests, we can greatly reduce the number of pests without the application of pesticides.
3. Exclusion refers to the use of caulk, mortar, screens or similar materials that can reduce or eliminate the entry of pests into the building.
4. Reservoir reduction refers to techniques such as removing a pest attraction feature, such as moving a dumpster a distance away from the building so that pests attracted to the dumpster are not brought close to the building.
5. Harborage reduction refers to elimination of habitat that provides a home (or harborage) to pests. For example, cleaning old equipment from a storage room will reduce harborage for mice. Mowing grass around a building will reduce the cover and harborage for pests.
6. Population reduction refers to means of control such as mechanical traps or use of repellents to drive away pests.

IMPACT ON HUMAN HEALTH & ENVIRONMENT

Methods used for pest control will have the lowest possible impact on human health and the environment. The pest control method will consider the effectiveness of the treatment for pest reduction while striving for the lowest level of adverse impacts on human health and the environment. Use of least-toxic chemical pesticides, minimum use of chemicals, use only in targeted locations and use only for target species shall be standard practice at all buildings.

Any cleaning products used for IPM must meet the requirements of LEED® for Existing Buildings: Operations and Maintenance™ IEQ Credit 3.3: Green Cleaning, Purchase of Sustainable Cleaning Products and Materials.

Insect Control:

Should an area need treatment to combat current or imminent insect infestation, a low toxicity, target-specific pesticide bait shall be the primary crack and crevice treatment of choice. Should the Technician find the use of such materials would likely be ineffective against that target pest or a poor choice due to environmental conditions or the availability of a bait listed to that target, a residual or non-residual contact insecticide chemical may be utilized. Technicians shall utilize Integrated Pest Management processes to determine which method of treatment shall be the most effective against the target pest with minimum negative effect on the facility's working environment as well as the global environment. Should a residual material be needed to control activity for longer periods of time or under emergency circumstances to gain control of a large or dangerous infestation, use shall be limited to only those areas that require such treatment and only in minimum volumes necessary to accomplish control of the target species.

Exterior applications of insecticide may be necessary during warmer months to prevent or correct a variety of infestations. Such applications may be crack and crevice or spot applications. Seasonal treatments will be done on an as-needed basis utilizing minimum volumes and in such a manner that will eliminate excessive drift of material.

All insecticides used are to be registered with the Environmental Protection Agency and shall be used in accordance with label guidelines for facilities such as Hope College. No insecticide containers shall be stored or discarded anywhere on the Hope College's property and shall be appropriately disposed of by the contractor.

Rodent and Nuisance Animal Control:

Control measures will generally consist of nontoxic trap stations depending on location and situation. Nuisance animal control will generally consist of humane live-trapping and removal.

Chemical pesticides are considered a last resort under the tenets of integrated pest management. Pesticides are to be used after non-chemical options have been exhausted, with a preference for use of a Tier 3 pesticide where a Tier 3 pesticide was determined by hazard screening to be of "lowest concern," because the product contains

- no known, likely, or probable carcinogens
- no reproductive toxicants (CA Prop 65 list)
- no ingredients listed by the EPA as known, probable, or suspect endocrine disrupters
- active ingredients has soil half-life of thirty days or less
- and is labeled as not toxic to fish, birds, bees, wildlife, or domestic animals

Nonrodent pesticides are also considered least toxic if they exceed the Tier 3 criteria but are used in self-contained baits and placed in inaccessible locations. Rodent baits are not considered least toxic under any circumstances.

Tier 3 products approved for use are:

| Product Name | Active Ingredient |
|------------------------------|-------------------|
| Advion Ant Bait indoor use | Indoxacarb 0.05% |
| Advion Roach Bait indoor use | Indoxacarb 0.06% |
| Gentrol | Hydropene 90.6% |

Tier 2 products are of “moderate concern” and to be used under emergency conditions (as defined above) or in the event that both preventative methods and least-toxic pesticides prove to be ineffective at pest control.

Tier 2 products approved for use under the conditions outlined above are:

| Product Name | Active Ingredient |
|--|------------------------|
| Maxforce FC bait gel | Fipronil |
| Maxforce Roach killer bait (reservoir) | Fipronil |
| Quibtox | Cholecalciferol 0.075% |

Tier 1 products are not intended for use except when there is a concern for public safety and in situations where the use of a Tier 2 product is inadequate or unsafe.

CONTROL METHODS

All users of chemicals on campus are to be credentialed pest control providers and utilize best practices for chemical storage, preparation, handling, and disposal.

| CHEMICAL APPLICATION PRACTICES | |
|---------------------------------------|--|
| User Qualifications | <ul style="list-style-type: none"> ▪ All chemical application and advice on pest-management problems will be made by a licensed pest control company, particularly in the creation of customized integrated pest management problems, which may require detailed knowledge of the biology and ecology of a particular species. ▪ If pesticides are required, the technician will determine the best product and application in accordance with approval requirements. ▪ A specialist must prepare and use all chemicals. |
| Species Considerations | <ul style="list-style-type: none"> ▪ Time the treatment to coincide with the presence of the pest. ▪ Use a selective chemical that has the least effect on non-target species and treat only the area affected. |
| User Safety | <ul style="list-style-type: none"> ▪ Users must wear protective clothing appropriate to the pest chemical application used. ▪ Ensure that anyone handling toxic chemicals never works alone and that the work area is well-ventilated. ▪ Wear a respirator for outdoor spraying or dusting of organic phosphorus compounds ▪ Eating, drinking and smoking must be prohibited when using or handling chemicals ▪ Users must be familiar with the effects on the body of the chemicals they are likely to be using, and how the chemicals may enter the body. ▪ Users must be aware of the signs and symptoms of acute poisoning related to chemicals they are using. They must stop work if they are feeling ill and seek medical advice. |
| Equipment | <ul style="list-style-type: none"> ▪ Equipment must be frequently checked and properly maintained, both for health and safety reasons and to minimize spray drift. |
| Weather/Time Restrictions | <ul style="list-style-type: none"> ▪ Spraying must not be carried out in unsuitable weather. Anyone operating sprayers must have access to a wind-speed meter and only spray when the wind speed is negligible. ▪ Hours of work must be controlled so that building occupants are not exposed. |

The method used for pest control shall take into consideration the relationship between pest biology and pest management methods, giving due consideration to the impact on human health and the environment. When chemical controls are necessary, this program will attempt to use products that are least toxic to human health and the environment, while remaining effective in control of the target pest(s).

| BASIC PLANT AND FUNGI CONTROL PRACTICES | |
|--|--|
| Maintenance | <ul style="list-style-type: none"> ▪ Keep the building grounds well-maintained at all times. Clear up plant debris, especially from fruit-bearing trees, ▪ Maintenance personnel shall use mulch and other landscaping best practices, warding off weeds and other pests. ▪ Keep vegetation trimmed at least 18 inches from the building. |
| Plantings | <ul style="list-style-type: none"> ▪ Maintain and plan landscape features to eliminate safe havens for pests. ▪ Avoid monocultures by mixing plant species in planters and gardens. |
| Manual Controls | <ul style="list-style-type: none"> ▪ Landscaping shall be hand weeded and chemical control shall be kept to a minimum. This measure prevents human and environmental exposure to hazardous chemicals. |
| Chemical Controls | <ul style="list-style-type: none"> ▪ When chemical use is necessary, replace hazardous substances with least-toxic chemicals as defined by the 2007 San Francisco Reduced-Risk Pesticide List |
| Inspection Schedule and Location | <ul style="list-style-type: none"> ▪ Responsible parties will inspect the site at regular intervals to monitor and apply pest controls operations. |

| BASIC ANIMAL PEST CONTROL PRACTICES | |
|--|---|
| Site/Building Cleanliness | <ul style="list-style-type: none"> ▪ Keep garbage containers clean, free of odors and covered at all times. Sanitation measures reduce habitat and food sources for pests. ▪ Keep areas around garbage containers free of spillage or garbage to prevent the collection of trash or debris on the ground around or underneath the containers. ▪ Keep grounds free of high weeds, trash, old equipment and debris, as these conditions create ideal harborage for rodents. |
| Structural Integrity | <ul style="list-style-type: none"> ▪ Maintain the building exterior in good repair with no holes or openings larger than ¼ inch including, but is not limited to, windows, doors, fans, vents, etc., to keep pests from entering the building. ▪ Address any deficiencies in the building exterior with corrective measures, i.e., cementing, screening, caulking, installing stripping on door bases, etc. ▪ Maintain door sweeps on all applicable doors to produce a good seal to the ground. |
| Inspection Schedule | <ul style="list-style-type: none"> ▪ Visual inspections shall be performed on a monthly basis to identify problem areas. |

Common pests and pest control measures are described below. **It is vital that pests are identified prior to implementing controls.** For example, pest control measures to control one type of cockroach or ant may be ineffective for another species of cockroach or ant. Some actions taken for ant control can even *promote* the spread of the ants if the ant species is not properly identified. Pest identification should be confirmed by a reliable source, such as use of keys in pest identification manuals (found on the Internet or in reference books), by consultation with a professional pesticide applicator, or by using a service such as the Michigan State University Extension Service.

Pavement Ants



This ant is 1/10th to 1/16th inch long and has two nodes on its pedicel. Their antenna has 12 segments. They are active foragers and establish trails along baseboards and other areas inside structures. They can easily move between floors using plumbing lines, which not only provide movement between floors, but also into the structure itself. The ants feed on a wide variety of foods including pet food, food bits dropped on the floor, grease, and seeds. These ants commonly invade buildings through cracks in cement slab floors and exterior walls. Exclusion through sealing of the cracks is an effective means of control. Exterior perimeter treatments use least toxic materials may be used as a second means to provide effective control. If ants still invade the building, baits are an effective means of control.



Carpenter Ants

Carpenter Ants vary in size and color but are usually blackish in color and range in size from ¼" to ½" in size. If winged carpenter ants are seen swarming in the spring, it may mean that there is a colony nesting in the structure. They can be distinguished from termites by the carpenter ant's slender waist. Termites have a wider waist. Carpenter ants look for sites with wet wood to build their nests. Ants inside a structure may be from a nest located within the structure. However, the ants may be foraging for food and may be from a nest outside of the structure. Carpenter ants tend to forage at night. You may place some food, such as a dab of honey, to bait the ants. Then, watch where the ants go. If they're going behind a baseboard or into a wall void, then attempt to determine if they're nesting in that location or if they're passing through the structure to an outside nest. Apply an appropriate least toxic pesticide. Baits are an effective means of control.



Roaches (general information)

Roaches can carry germs and disease. Sanitation and reduction of harborage are important in reducing the incidence of roach infestation. Glue boards may be used to detect the presence of roaches. Where roaches are found, baits can be an effective means of control. Crack/crevice/void treatments should also be used.



Mice

Mice may enter buildings to seek shelter. Exclusion and reservoir reduction are effective means of control. Keep weedy fields mowed. Move dumpsters away from the building. Clean the area of any debris that offers harborage. Use exclusion methods such as screens, caulk, and door sweeps. To eliminate mice present in the building, it is preferable to use mechanical methods such as traps or glue boards. Baits can be an effective tool, but should be used only with extreme caution and should not be used in areas accessible to building occupants.



Head Lice

Head lice generally do not survive for more than a few hours when away from a host. Due to the biology of lice, insecticidal treatments are generally not effective and should not be done. Instead, affected parties should be informed about the pest biology and given instruction for effective control measures on hosts.

Flies and Gnats

There are MANY types of flies and gnats. Proper identification is vital to determine the best type of pest control. Proper sanitation can provide effective control for most flies and gnats. Screen windows and doors to exclude these pests. Garbage containers should be closed and kept an appropriate distance from the buildings. Insecticides may be appropriate for reducing large populations of adult flies, but sanitation is the preferred means of control.

Other Pests

Other pests such as yellow jackets, hornets, and carpenter ants may occur. In all cases, the relationship between the pest biology and effective control measures must be considered. Least toxic measures should be used in all circumstances.

SITE EVALUATIONS AND MONITORING

Each building where pesticides are applied will be identified by name and address and provide a short description of the use of the building and any known pest problems. The site evaluation must include recommended types of inspection and monitoring schedules. Site evaluations will be completed by a licensed pest control contractor. Monitoring will be done by building managers and any sightings will be reported via the Physical Plant work order system.

Kitchens, Break Rooms, Cafeteria, Home Education Room

Visual inspection with a particular emphasis on cockroach and rodent infestations. Look for droppings, gnawing, harborage or insanitary conditions. Monitoring devices such as glue boards may be used. Recommended to monitor on a weekly basis during periods when school is in session and bi-weekly during periods when not in session.

Boiler Room, Maintenance Areas

Visual inspection. Monitor for rodents and insects with glue boards or traps. Monitor on bi-weekly basis.

Bathrooms, Locker Rooms, Store Rooms and Closets

Visual inspection. Bathrooms and locker rooms may be attractive to roaches. Look for droppings and/or egg cases. Monitoring devices such as glue boards may be used. Recommended to monitor on a weekly basis during periods when school is in session and bi-weekly during periods when not in session.

Classrooms and Hallway

Visual inspection. Recommended to monitor on a weekly basis during periods when school is in session and bi-weekly during periods when not in session.

Exterior Areas

Monitor periodically. Look for entry points into the building. Look for areas that can serve as a reservoir for pests such as weedy areas or accumulations of debris.

The environmental performance of the IPM program shall be compiled from IPM records and analyzed on a semi-annual basis. An IPM report identifying the types of pest problems encountered at the buildings and the types and quantities of all pesticides used shall be generated by the Physical Plant for review. The following metrics shall be tracked throughout the year and documented to evaluate the IPM Plan:

1. The severity and location of all major pest infestations
2. The amount of each pesticide product used by volume

RESPONSIBLE PARTIES

The Physical Plant is responsible for the monitoring consistent and correct implementation of the IPM Plan. This department and Shoreline Services, Inc. are responsible for record keeping and performance measurement. The compiled records from all parties will be synthesized by as part of an annual IPM review.

| Title | Contact | Phone | Area of Responsibility |
|-------------------------|----------------|--------------|-------------------------------|
| Physical Plant Director | Kara Slater | 616-395-7835 | Coordinator |
| Pest Management Company | Jefrey Budd | 616-394-9100 | Pesticide Applicator |
| Hope Grounds | Bob Hunt | 616-395-7828 | Pest Identification |