State of Michigan

Integrated Pest Management Training Manual

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Preface

In Michigan, Integrated Pest Management (IPM) is a requirement of law for persons who apply pesticides (other than sanitizers, germicides, disinfectants, or antimicrobial agents) in schools, day care centers, public buildings, and health care facilities. IPM is regulated under Michigan's Natural Resources and Environmental Protection Act, Act 451 of 1994, Part 83, Pesticide Control and under Michigan's Regulation 637, Pesticide Use.

Regulation 637 requires pesticide applicators who are applying pesticides (other than sanitizers, germicides, disinfectants, or antimicrobial agents) in schools, day care centers, public buildings, and health care facilities to receive verifiable training in IPM.

Because IPM training must be verifiable, you will need to provide the Michigan Department of Agriculture and Rural Development (MDARD), Pesticide and Plant Pest Management (PPPM) Division with confirmation of your completion of this training manual. This is done by completing the training verification form found on the next page and returning it to the MDARD office in Lansing. You will find the address for the Lansing office on the form. Upon receipt of a properly completed form, the individual's name will be recorded into a database of IPM trained applicators, and the individual will be issued an IPM Training Certificate.

It is imperative that your training efforts be documented and recorded by the MDARD. The MDARD training records may be used to verify compliance with Michigan law for applicators utilizing this self-study tool and failure to comply with those regulatory requirements could result in enforcement actions.

If you have any questions, please contact MDARD's IPM Program Specialist at 800-292-3939.

Verification of IPM Training

INSTRUCTIONS: The pesticide applicator's immediate supervisor must complete and return this form to the Michigan Department of Agriculture and Rural Development (MDARD). Self-employed individuals who do not have an immediate supervisor may indicate so by checking the box below. If you would like to receive the IPM training certificate by email, please provide an email address for the applicator and/or employer below. If an email address is not provided, the certificate will be mailed to the address provided.

Applicator First, MI, Last Name: _____

Applicator Email: _____

Company Name: _____ Company Email: _____

Address: _____City: _____State: _____Zip: _____

I, _____(Name of Supervisor), employed by the company listed above certify that the applicator listed above has completed the MDARD self-study IPM training program. This training was completed on the date below and included a review of all chapter information and a completion of the self-study questions.

I'm self-employed.

_____
Date Training Completed

_____
Signature of Applicator Date

_____
Signature of Immediate Supervisor Date

Please email the completed form to MDARD-Pesticide@Michigan.gov with "IPM Training Verification" in the subject line.

You may also mail the form to:
MDARD - PPPM
IPM Program
P.O. Box 30017
Lansing, MI 48909

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INTRODUCTION

Pesticides are used to protect food, crops, pets, homes and people from pests. Public concern about health and environmental risks associated with pesticides is a public issue. To address this concern, pest managers and regulatory agencies are promoting the use of effective alternative pest control methods. Managers with pest control decision-making responsibilities should become aware of the pest control options available to reduce exposure to potentially harmful pesticides.

Integrated Pest Management (IPM) is defined as a pest management system that utilizes all suitable techniques in a total pest management system with the intent of preventing pests from reaching unacceptable levels or to reduce an existing population to an acceptable level. An emphasis is placed on manipulation of the pest's environment to the point that it will not support a pest population. Biological controls may also be used.

IPM can also be defined as an effective and environmentally sound approach to pest management that relies on a combination of commonsense practices. Its goal is to manage pests with the least possible hazard to people, property, and the environment. IPM is a comprehensive approach to pest management.

The State of Michigan has enacted laws to require the use of IPM in certain situations.

- Act 451, Part 83, Pesticide Control requires that an IPM program be in place for the building before any pesticide applications (other than sanitizers, germicides, disinfectants, or antimicrobial agents) are made in schools, day care centers, public buildings, or health care facilities.
- Regulation 637, Pesticide Use, Rule 14 requires that a person who applies a pesticide, other than a sanitizer, germicide, disinfectant or antimicrobial, in a school, daycare center, medical care facility or public building to participate in a verifiable IPM training program approved by MDARD prior to making pesticide applications.

KEY TERMS USED IN THIS MANUAL:

Applicator: A person who applies pesticides by any method for any purpose at any place.

Biological control: A reduction of pest populations by natural enemies such as predatory insects or pathogens of the pest.

Building manager: A person who is designated as being responsible for the building's pest management program and to whom any reporting and notification shall be made.

Certified applicator: A person authorized under Act 451, Part 83, Pesticide Control to use and supervise the use of a restricted-use pesticide.

Commercial applicator: A person who is required to be a registered or certified applicator under Act 451, Part 83, Pesticide Control, or who holds themselves out to the public as being in the business of applying pesticides. A commercial applicator does not include a person using a pesticide for a private agricultural purpose.

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

Day care center: A facility, other than a private residence, which receives one or more preschool or school-age children for care for periods of less than 24 hours a day, at which the parents or guardians are not immediately available to the child, and which is licensed as a childcare organization by the Michigan Department of Human Services in accordance with Public Act 116 of 1973, as amended, MCL section 722.111 to 722.128.

General use pesticide: A pesticide that is not classified as a restricted use pesticide and can be purchased without restriction.

Health care facility: A facility which is not a private home and at which people may stay one or more nights and receive medical care, such as a hospital or nursing home.

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

Incidental use: The application of a general use pesticide as an accompanying minor occurrence to a primary work function. Example: A postman who uses a dog repellent.

Multiple-use area: Developed outdoor public recreation areas, such as campgrounds, rest areas, parks, playgrounds, picnic areas, and athletic fields. The term does not include undeveloped forest areas.

Notification registry: A list of persons who require notification before a turf or ornamental pesticide is applied on a property that is adjacent or near their property as described in Regulation 637, Pesticide Use, Rule 5.

Pest: An insect, rodent, nematode, fungus, weed, and other forms of terrestrial or aquatic plant or animal life or virus, bacteria, or other microorganism, or any other organism that the director declares to be a pest.

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.

Public building: A building that is owned or operated by a federal, state, or local government, including public universities.

Ready-to-use pesticide: A pesticide that is applied directly from its original container consistent with label directions, such as an aerosol insecticide or a rodenticide bait pack that does not require mixing or loading prior to the application.

Re-entry interval: The period of time between the application of a pesticide and the time when people are allowed to return to the treated area without personal protective equipment. Note that liquid, spray or aerosol insecticide applications shall not be made in any room of a school building unless the room will not be occupied by students for not less than four hours after the application, unless the product label requires a longer re-entry period. The building manager shall be notified of the re-entry restrictions by the applicator.

Registered applicator: A person who is not a commercially certified applicator and who is one or more of the following:

- Authorized to apply general use pesticides for a commercial purpose as provided in Act 451, Part 83, Pesticide Control and the rules promulgated under the Act.
- Authorized under Act 451, Part 83, Pesticide Control to apply general use pesticides as a scheduled and required work assignment in the course of his or her employment on the property of another person for any purpose.

Restricted use pesticide: A pesticide that is classified for restricted use by the federal Environmental Protection Agency or by the MDARD director.

Sensitive area: This includes any of the following:

- Occupied school buildings, together with any land that is part of the same property and is within 100 feet of such buildings, and includes any playgrounds, athletic fields, or other such facilities which are in the vicinity of school buildings and which are in use at the time of the pesticide application.
- Commercial preschool and day care facilities that are located in buildings which are identified by signs or other means and which are recognizable to the public.
- Posted bus stops which are identified by signs and which are recognizable to the public.

School: Public and private schools, grades kindergarten through the twelfth grade.

Use of a pesticide: The loading, mixing, applying, storing, transporting, or disposing of a pesticide.

ACRONYMS USED IN THIS MANUAL

EPA	Environmental Protection Agency
IPM	Integrated Pest Management
MDARD	Michigan Department of Agriculture and Rural Development
PPE	Personal Protective Equipment
PPPM	Pesticide & Plant Pest Management

SECTION I – REGULATORY REQUIREMENTS

State of Michigan Regulatory Requirements

Michigan law requires persons who apply pesticides, other than general-use ready-to-use pesticides, in the course of their employment, to be a certified or registered applicator. A custodian using a hand-pump sprayer in which pesticides were mixed from concentrate would need to be a certified or registered applicator. A school staff member who applies wasp spray from an aerosol can would not be required to be a credentialed applicator.

State and federal law require pesticides to be used in accordance with the product labeling. Strict adherence to label requirements helps to ensure the protection of the applicator and the environment.

State law requires that before a pesticide application is made in a school, day care center, public building, or health care facility:

- The pesticide applicator must have participated in a verifiable training program (studying this manual and submitting the verification of training form fulfills that requirement), and
- There must be a verifiable IPM program in place for the facility.

In addition, pesticide applications made in and around schools, day care centers, health care facilities, and public buildings must be made in accordance with specific requirements for posting, notification, reentry, and IPM. These requirements are found in:

- The Natural Resources and Environmental Protection Act, Act 451 of 1994, Part 83, Pesticide Control
- Regulation 636, Pesticide Applicators
- Regulation 637, Pesticide Use

Some of the highlights of these regulatory requirements are described below. If you have further questions pertaining to the regulatory requirements of pesticide use, please contact the Michigan Department of Agriculture and Rural Development, Pesticide and Plant Pest Management Division at 800-292-3939.

Act 451, Part 83, Pesticide Control, Section 8316

- IPM Program Requirement for Schools and Day Care Centers
- Parent/Guardian Notification for Schools & Day Care Centers
- Reentry Requirements for Schools & Day Care Centers

1. A verifiable IPM Program must be in place prior to use of a pesticide in a school or day care center. The term “integrated pest management program” is defined in Section 8304(6). The definition is lengthy, and it provides several details regarding the specific data elements that an IPM program must include. The words “day care center” and “school” are defined in Section 8303(1) and 8306(7) respectively.

2. Schools and day care centers must annually notify the parents/guardians of children who attend the school or day care center that they will receive advance notification of the application of a pesticide, other than a bait or gel formulation, at the school or day care center. Schools must provide this written notification within 30 days of the beginning of the school year. Day care centers must provide the information during the month of September.

3. The annual notification shall satisfy the following requirements:
    a. The notification shall be made in writing.
    b. The notification shall specify 2 methods by which the advance notification of a pesticide application will be given at least 48 hours before the application. The first method shall be by posting the primary entrance(s) to the school or day care center. Subject to subdivision (c), the second method shall be at least one of the following:
        i. Posting in a public, common area of the school or day care center, other than an entrance. A bulletin board near the administrative offices is an example of an acceptable area.
        ii. E-mail.
        iii. A telephone call by which direct contact is made with a parent/guardian of a student of the school or a child under the care of the day care center, or a message is recorded on an answering machine.
        iv. Providing the students of the school or children under the care of the day care center with a written notice to be delivered to their parents/guardians.
    c. The notification shall state that, in addition to being notified as described above, parents/guardians are entitled to receive the notice by first-class United States mail postmarked at least 3 days before the application, if they so request, and the manner in which such a request shall be made.
    d. For a school, inform the parents/guardians that they may review the school's IPM Program, if any, and records on any pesticide applications.
    e. For a school, provide the name, telephone number, and, if applicable, e-mail address of the person at the school building responsible for pesticide application procedures.

4. Before the application of a pesticide, other than a bait or gel formulation, the school or day care center must provide parents/guardians with advance notice. (Please note that an example of a form that can be used for the advance notice is included in this manual on page 25.) An advance notice shall contain all of the following information:
    a. A statement that a pesticide is expected to be applied.
    b. The target pest(s).
    c. The approximate location of the application.
    d. The date of the application.
    e. The name, telephone number, and, if available, email address of a contact person at the school or day care center who is responsible for maintaining records with specific information on pest infestation and actual pesticide application as required by rules.
    f. A toll-free telephone number for a national pesticide information center recognized by MDARD and a telephone number for pesticide information from MDARD.

5. In an emergency (such as a treatment to kill stinging insects) a school or day care center may apply a pesticide without providing advance notice to parents/guardians. Promptly after the emergency pesticide application, the school or day care center shall give parents/guardians notice of the emergency pesticide application.

6. Use of any liquid spray or aerosol insecticide application shall not be made in a school or day care unless the room will be unoccupied by students or children for not less than 4 hours after the application or unless the product label requires a longer reentry period.

Regulation 637, Pesticide Use, Rule 11

- Posting Requirements Following the Use of a Pesticide

Indoor Insecticide Treatments:

If you make insecticide applications, other than with a general-use ready-to-use pesticide, to any of the following sites, then you must provide posting. The sites include:

1. A commercial or public building.
2. A health care facility.
3. A day care center.
4. A school.

If you make a broadcast, foliar or space application of an insecticide (other than a general-use ready-to-use pesticide) inside a commercial building, public building, or health care facility, then you must provide a sign to be displayed at the primary point(s) of entry into the building by the building manager. The sign must:

1. Be posted for not less than 48 hours.
2. Be a minimum of 2 ½ inches by 2 ½ inches.
3. Be printed in black letters on a muted background.
4. Include a symbol of a house encompassed by a cloud.
5. Include a space for the date of application to be recorded.

Note that because a school or daycare is required to post advance notice of a pesticide, other than a bait or gel formulation, or other than a sanitizer, germicide, disinfectant or antimicrobial agent, MDARD will allow the school or daycare to substitute the advance notice in place of the “house in the cloud” posting.

Lawn and Ornamental Plant Treatments:

If you make pesticide applications to turf (lawn) or ornamental sites at a location such as a school, day care center, commercial building, public building, or health care facility, then the site must be posted immediately following the pesticide treatment with a lawn marker sign at the primary point(s) of entry to the treated area. Lawn marker signs shall be in compliance with all of the following specifications:

1. Be a minimum of 4 inches high by 5 inches wide.
2. Be constructed of rigid, weather-resistant material.
3. Be attached to a supporting device with the bottom of the marker extending not less than 12 inches above the turf.
4. Be identically printed on both sides in green letters on a white background using the indicated point type size specified.
5. Include all of the following information:
    a. The statement “CAUTION” in 11/16-inch high (72-point) type.
    b. The statement “Pesticide Application” in 9/32-inch (30-point) type.
    c. The statement “Keep Off Until Dry” in 9/32-inch (30-point) type.
    d. Have not less than a 2-inch diameter circular illustration that depicts 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.
    e. The statement “Customer: Please Remove After 24 Hours” in 3/32-inch (11-point) type.

6. Additional information not specified in this rule may only be placed on the lawn marker and supporting device upon the written approval of the MDARD.

Regulation 637, Pesticide Use, Rule 14

- IPM Training Requirements for Public Buildings and Health Care Facilities
- IPM Program Requirements for Public Buildings and Health Care Facilities

This rule requires any person who applies a pesticide, (other than a sanitizer, germicide, disinfectant or antimicrobial agent), in a school, day care center, public building or health care facility, to have participated in a verifiable IPM training program which is approved by the MDARD. This IPM Training Manual serves as an approved IPM training program for the purposes of this rule.

This rule requires that a verifiable IPM Program be in place prior to the application of a pesticide (other than a sanitizer, germicide, disinfectant, or antimicrobial agent) that is applied in a public building or health care center. Note that schools and day care centers are also required to have a verifiable IPM Program under Act 451 of 1994, Part 83 Pesticide Control, Section 8316.

Regulation 637, Pesticide Use, Rule 15

- Pesticide Use in and Around Schools and Day Care Centers

All applications of insecticides, fungicides, and herbicides that are made in and around schools and day care centers are subject to the provisions of this rule.

1. A 100-foot buffer must be maintained between occupied classrooms and a turf or ornamental site where liquid spray pesticide applications are made during normal school class hours or when persons are using the treatment area.
2. A pesticide applicator must notify the building manager of any reentry periods required by the label(s) of any pesticides used on school or day care property.
3. The annual notification of pesticide applications to parents/guardians as required under the Act shall include a designation of the commonly used primary entrances at which the posting of pesticide application information (as required under the Act) shall occur.
4. During the months when school is not in regular session, school administrators may utilize a message notification system that parents/guardians may access at least 1 day before any pesticide application. If this alternative is utilized, parents/guardians shall be advised as to how the information may be obtained.

SECTION II – ESTABLISHING YOUR IPM PROGRAM

Setting the Tone

An efficient IPM program should be integrated with existing facility management programs such as janitorial practices, lawn care and facility maintenance. An efficient IPM program should include the cooperation of the staff using the facility. The following steps are an example of how an IPM program can be developed:

1. Develop an official IPM policy statement. This useful first step in making the transition from a conventional pesticide program to an IPM program goes beyond simply stating a commitment to support and implement an IPM approach. It acts as a guide for the pest manager to use in developing a specific IPM program.
2. Designate pest management roles for occupants, pest-management personnel, and key decision-makers, and assure good communication among them. Educate and train people for their respective roles.
3. Set pest management objectives for the site(s). For every site, pest management objectives will differ. The type of pest management should be outlined.
4. Inspect site(s) and identify and monitor pest populations for potential problems.
5. Set action thresholds. These are the levels of pest populations or site environmental conditions that require remedial action.
6. Apply IPM strategies to control pests. These include redesigning and repairing structures, improving sanitation, using traps and applying pesticides only when needed.

Communication

For your IPM program to function effectively, it is necessary to have good two-way communication between those who are conducting the IPM program and the users of the facility. Much of the communication will take place between the building manager and the pesticide applicator directly.

Communication can take many forms, such as speaking with staff members about pest sightings, discussing ways to reduce pest populations through improved housekeeping or by making repairs, and by soliciting staff cooperation. One way of obtaining staff cooperation is by explaining to the users of the facility how IPM enhances and compliments the “regular” pest control service where pesticides are applied.

Communication educates the users of the facility and other interested parties about potential pest problems, their causes, and the IPM solution. Simply having informed individuals who will spot and report pest problems can go a long way toward managing pests.

The building manager and the IPM technician must work together and obtain cooperation from the building’s occupants to ensure the program’s success. They should communicate to the occupants what their responsibilities are and how they (the occupants) can help implement the IPM program.

Commercial applicator responsibilities:

- Ensure that the building manager has a copy of the IPM program and initial service inspection record.
- Obtain acceptance from the building manager that he/she will post any required signs.
- Provide to the building manager the required recordkeeping information at the completion of each service.

Building manager responsibilities:

- Accept the responsibility to post all required signs.

- Assist the commercial pesticide applicator with the implementation of the IPM program and plan.
- Ensure that each facility has a complete IPM program in place at all times.

Writing Your IPM Program

Please be advised that MDARD has posted a sample IPM Program which is available as a free download on our web site at www.Michigan.gov/MDARD-IPM

Required IPM Components:

Michigan law has certain requirements regarding the content of a verifiable IPM program. In Act 451, Part 83, Pesticide Control, Section 8304(6) the law lists all the IPM Program data elements that are ***required (marked *)*** to be included in an IPM Program. This portion of the IPM Manual will assist you in setting up an IPM Program. The required components are identified with an asterisk next to the subtitle in this section. However, to make your IPM Program easier to use, we strongly recommend that additional components are also included in your plan.

A. Policy Statement

A policy statement should state the intent of the facility administration to implement an IPM program. It should provide guidance on what is expected. The following is an example of a policy statement: (Name of your facility) recognizes that structural and landscape pests can pose significant problems to students/staff, school facilities, and the environment. We also recognize that pesticides may pose hazards to the health and safety of the same people and the environment. Therefore, it is the policy of (your facility) to incorporated IPM procedures for the control of pests to better control these pests while reducing the potentially adverse effects of pesticides. These procedures will be in compliance with Michigan law, The Natural Resources and Environmental Protection Act, Act 451 of 1994, Part 83, Pesticide Control, and the rules promulgated thereunder.

B. Definitions Section

Terms such as IPM, pest, pesticide, RTU, building manger, biological control, chemical control, habitation modification, structural modification, and behavior modification are words that some people may not be familiar with. A definitions section will help clarify confusion about terminology. It is important that all parties using the IPM Program understand what the program is describing and that they agree on the basic principals and practices of the program.

C. Responsibility Section

Designating pest management roles of the parties involved is an important key to the success of the IPM program. When the respective roles of all the parties involved are identified and agreed upon, and when parties communicate well with each other and meet their responsibilities, then a successful outcome is much more likely. For example:

- The building manager is responsible for the building's pest management program. Any reporting and notification shall be made to the building manager.
- The pest control operator and/or pesticide applicator shall monitor and evaluate the site and decide what actions need to be taken to achieve the site's pest management objectives. He/she will perform the necessary pest management actions and/or will recommend to the building manager actions to be taken at the facility.

- The custodial staff is responsible for sanitation and monitoring of the site for pest infestation. Much of the prevention and control of pests depends on whether or not proper maintenance and cleaning is performed. Custodial staff will report to the building manager regarding pest control issues.
- The facility employees are responsible for sanitation and monitoring of their work areas. Storing snacks in work areas can attract pests to the site. Facility employees will report pest sightings and unsanitary conditions to the building manager for further action.

D. Site Evaluation *

Site evaluation is a vital step in establishing the condition of the facility as it relates to pest management. The following four basic elements are required by law in a site evaluation:

- Site Description
- Site Inspection
- Site Monitoring
- Concept of Threshold Levels

Site Description – This is a description of each building that helps to identify areas of current or potential pest problems. The site description is updated periodically to reflect repairs, remodeling and other site changes. A site description should include:

- Building name and address
- Purpose or use of the building
- History of the building's pest problems
- The building layout and features such as: floor plan, number of floors, kitchen facilities, boiler rooms, overall conditions, neighboring property, etc.

Site Inspection – The IPM mandate in Michigan requires the applicator to first conduct an initial service inspection that can serve as the starting point for the IPM program. Inspect both the interior and exterior of the building for activity and conditions conducive to pests. Ongoing inspections (often monthly) allow you to detect newly arrived pests and begin controlling them before they become a serious problem. The inspection should focus on vulnerable areas of the facility such as kitchens, lounges, concession areas, cafeterias, custodian closets, pools, locker rooms, and rooms where food, water and clutter are present. During inspections, ask facility occupants if they have seen pests or evidence of pests. Facility occupants can assist in the inspection by reporting and recording in the IPM logbook (see appendix) any pest activity.

Site Monitoring – This is the process of watching for increases or decreases in pest activity. There are two common methods used in monitoring for pest problems, including the "active method" and the "passive method."

Active Method – This involves regularly scheduled visual inspections that can be time consuming. The inspection accuracy may depend on the education and experience of the pest control person. Inspections involve the use of traps and looking for pest signs, such as droppings, chewing, pest hairs, insect eggs, etc.

Passive Method – This method includes monitoring practices that record pest related activity without an experienced pest control person. A staff member of the facility regularly checks the monitoring stations and records the findings.

Concept of Threshold Level –The concept of threshold levels is a key component of conducting a proper site evaluation.

A threshold level is the level of pest infestation that can be tolerated by the occupants. It varies depending on the site, the pest, and the occupants of the facility. A few ants in a boiler room would be tolerated more easily than the same number of ants in a kitchen area. Similarly, a few ants might receive less attention than a few cockroaches would. The pest control operator must understand this concept and be able to communicate it to the facility manager. When a pest population exceeds the threshold level, then actions should be taken to control the pests. Each facility may have a different action threshold level, which can change from facility to facility, and even from month to month. Under the threshold level concept, the applicator should be able to decide when to take action and what method will be employed, or whether they should just continue to monitor the pest level. Different levels of pests may require different IPM pest control methods.

E. Consideration of the Relationship between Pest Biology & the Pest Management Method of Choice *

The consideration of the pest's biology and how it relates to the best method for control is a very important factor in controlling pests. Determining the pest's biology and habits will help guide the IPM manager in selecting the best pest management method. Proper pest identification is essential because it will help you determine the behavior and habits of the pest. Without proper pest identification, you cannot make an informed decision about how to best control the pest, or if control is even necessary. Once a proper identification is made, the choice for pest management can then be made based on the method that will most effectively make the habitat undesirable for the pest.

A review of pest biology should include the following factors:

- Routes of Entry
- Climate
- Food and Water Sources
- Harborage Areas

F. Pest Management Methods *

The IPM methods are the heart of a good IPM program. Pest control methods such as trapping, caulking, powerwashing, and vacuuming are control measures that are effective and can be used with a high degree of safety. The pest control operator should focus on methods that will prevent pests over the long term, such as pest proofing or operational changes that improve sanitation. Proper IPM methods encourage ongoing maintenance and housekeeping to insure that pests will not find a hospitable environment in the facility. The IPM methods can be divided into two categories: the **population reduction method** and the **prevention method**. When used together, they will give a comprehensive approach to pest management for ultimate control.

1. **Population Reduction Method:** The population reduction method includes mechanical, biological, and chemical control. Each is discussed below:

    - *Mechanical control* includes the use of traps, devices, and machines to control pests or alter their environment. Traps, screens, barriers, fences and nets can be used to prevent the spread of pests from an area.
    - *Biological control* is a pest management method that reduces or mitigates pests and the adverse effects of those pests through use of natural enemies. Use of parasitoids, predators, and pathogens, combined with habitat management strategies have proven to be

successful in suppressing some pests. Biological control, in general, is man's use of a select living organism to control a particular pest.

- *Chemical control* uses naturally derived or synthetic chemicals called pesticides that kill, control, mitigate, attract, or otherwise interfere with the normal behavior of a pest. The pest control industry has expanded their pesticide application products to deliver safer systems to the end users that will minimize exposure. Baits and gel formulations have become major tools in the war against roaches.

2. **Pest Prevention Method:** The pest prevention method includes two major methods, which includes habitat modification and sanitation, and the practice of behavior modification. Each method is discussed below:

    - *Habitat Modification and Sanitation.* Habitat modification and sanitation involves changing the environment of the pest so that they can not live or reproduce there. This practice helps to prevent and suppress some pests by removing the pest themselves or their shelter, food and water sources. Pests in facilities can be greatly reduced by improving cleanliness, eliminating pest hiding places, increasing the frequency of garbage pickup and by pest-proofing the structure.
    - *Behavior Modification.* Behavior modification addresses the human habits that create conditions conducive to pest activity. This can be a difficult method to implement because it involves trying to change people's habits. A strong educational program regarding human behavior that creates conditions conducive to pest activity is probably the best way to address this. A behavior education program could entail a simple bulletin or flyer addressing behaviors/practices that attract pests such as leaving open food out, not cleaning food spillage, or keeping a cluttered work area. If unacceptable behaviors continue, then management needs to take a stronger stand regarding actions that must be taken to reduce or eliminate conditions conducive to pests.

G. Impact of Pesticides on Human Health and the Environment *

Pesticides may be used in IPM programs in Michigan. However, they should not be applied automatically without first considering alternative pest control methods. If used, pesticides should be used in a way that will minimize the risk to people, property, and the environment. There are many factors to consider when choosing a pesticide for use in a facility. You want them to be effective while posing the least risk to the occupants. Three main characteristics should be considered when choosing a pesticide to use:

1. **Toxicity** is the capacity of a chemical to cause illness or injury. The more toxic pesticides can cause injuries at smaller doses and are therefore more hazardous to use. Each pesticide has a signal word (danger, warning, or caution) printed on the pesticide label to give you a relative measure of the toxicity of the pesticide formulation.
    a. *Danger* means highly toxic.
    b. *Warning* means moderately toxic.
    c. *Caution* means slightly toxic or relatively nontoxic.
2. **Volatility** is the measure of how fast a pesticide vaporizes when exposed to the air. The lower the volatility, the less the pesticide vaporizes into the air after treatment. Information about a pesticide's volatility can be found on the Material Safety Data Sheet (MSDS).
3. **Formulation** is a term that describes the physical state of the pesticide. The product may be distributed as a wettable powder, dust, granular product, emulsifiable concentrate, aerosol, bait, or other form. The type of formulation is very important to the issue of safety. For example, an insecticide dust is a good choice for application into a wall void, but it would be

a poor choice for an application into a drop ceiling where vibration might cause the dust to drift down onto persons below.

H. Program Evaluation *

Program evaluation is a regular and periodic review of inspection reports, sanitation reports, logbook records, application records, and other records to determine how the program is working, and identify any changes in pest activity (increase or decrease). The review should note the correlation between actions taken and changes in pest populations. The result should be compared with goals and objectives. The following is a list of questions to consider in measuring success:

- Are all pest populations below action thresholds?
- Have all objectives been met?
- Is the monitoring program adequate?
- Should other action be taken?
- Can time and effort be reduced?
- What problems have been identified?
- What changes are necessary?

I. Forms *

Recordkeeping

Recordkeeping is a vital and required component of an IPM program. Maintaining good records will help you solve pest problems and give you a historical perspective of pests. A review of good records will enable you to anticipate seasonal pest problems and the IPM method(s) that will give the best control. It is recommended that all records be kept in a centralized location accessible to key members of the IPM team.

Although Michigan law does require facilities to maintain IPM records, the law does not specify a specific format for the recordkeeping requirement. Facilities are free to develop any type of recordkeeping that suits their needs, but the records MUST include certain data elements as described below.

Note that there is some overlap in the requirements of the Act and the Regulation with regard to recordkeeping. The reason for the overlap is that the records required by the Act are specific to IPM treatments, whereas the records required by the Regulation are specific to commercial pesticide applications. A commercial pesticide application is a pesticide treatment that occurs at the workplace with a product that is not a general-use ready-to-use product, including the application of products such as weed-and-feed fertilizers or a pesticide sprayed through a backpack or hand-pump sprayer. Most facilities find it easiest to combine all of the recordkeeping requirements on one form and maintain that record to comply with the recordkeeping requirements of both the Act and the Regulation.

Act 451, Part 83, Pesticide Control, Section 8304(6)(b):

The Natural Resources & Environmental Protection Act, Act 451 of 1994, Part 83, Pesticide Control, requires the following recordkeeping information for IPM programs. Records must include at least the following information:

- The site address.
- The date of service.

- The target pest(s).
- The number of pests found.
- A record of any conditions conducive to pest infestation.
- A record of any pest management recommendations
- A record of any structural or habitat modifications that were initiated.
- The name of the pesticide(s) used.
- The quantity of the pesticides used.
- The location where pesticides were used.
- The name of the applicator.
- Where applicable, the name of the pest control firm and the emergency telephone number.

Regulation 636, Pesticide Applicators, Rule 15:

Michigan Regulation 636, Pesticide Applicators, Rule 15 requires all commercial pesticide applicators to maintain certain records for application of any non-ready-to-use pesticides. The records must be kept for at least three years for restricted-use pesticide applications and at least one year for general-use products. The records must include at least the following information:

- The product's brand name.
- The product's EPA registration number.
- The concentration of the pesticide(s) applied. Note that the concentration MUST be recorded as defined in the regulation, which means you need to show the amount of formulated material (in other words, the pesticide product itself) plus the amount of carrier (which is often water) used to make an end-use dilution.
- The target pest(s) or purpose of the pesticide treatment.
- The date the pesticide was applied.
- The address or location of the pesticide application.
- The method of application.
- The rate of application.

The records required by the laws discussed above must be provided to the building manager or his/her authorized representative at the time of the application or made available electronically within 48 hours after the service. In addition, the records must be made available upon request to an authorized representative of the MDARD director during normal business hours.

It is common for persons using an IPM program to combine the required recordkeeping data elements from Act 451, Part 83 and from Regulation 636 onto one form, but you are free to create any recordkeeping system that works for you. A sample recordkeeping form is included with this manual.

Records must be verifiable, which means that they must be in format that can be reproduced or reviewed by others, such as a printed record or computerized record.

Other Forms:

It is recommended that the IPM program includes the following:

- A copy of the service schedule.
- A copy of a current label and SDS for any pesticide used, or any pesticide that is anticipated to be used.
- Pest surveillance data sheets.

SECTION III – SAMPLES & FORMS

The following section includes forms and samples that can assist you in developing your IPM program. You may download a free template of an IPM Program on MDARD's web site at www.Michigan.gov/MDARD-IPM

Verification of Training

> You are ***required*** to submit a completed Verification of Training form for any person who will apply pesticides as part of a required IPM program. This firm is located at the beginning of this document. Please fill out the form completely and submit to the address listed on the form. You can make copies of the form as needed for additional employees.

A list of additional sample forms and information in this section includes:

- Common Pests Description
- IPM Pest Sighting Log
- Pest Reporting Form
- IPM Monitoring Station Record
- IPM Pesticide Applicator Information
- Pesticide Recordkeeping Form
- **Annual** Notification of Pesticide Applications
- **Advanced** Notice of Pesticide Treatment

Common Pest Descriptions:

An IPM program includes the accurate identification of pests, which is a vital step to ensure that control methods will be effective. Your IPM program should include information regarding pests that may commonly be found at a facility such as yours.

Once the pest has been identified and the conditions that are conducive to the infestation have been determined, IPM techniques may greatly reduce the prevalence of the pests.

To determine appropriate pest control options, you need to know certain things about the pests, such as:

- What do they eat?
- Where do they hide?
- How did they enter the building?
- What damage did/could they cause?

Identification of the pest can be determined through a variety of means, such as contacting a knowledgeable pest control operator, or you may get information through the Internet, or you can contact your Michigan State University (MSU) Extension Office. Local MSU Extension office locations can be found on the Internet at https://www.canr.msu.edu/outreach/county .

The following is an example of a brief identification guide and background information for a few common pests found in Michigan. A section including this type of information should be included in your verifiable IPM program.

German Cockroach – *Blattella germanica*

There are several different types of cockroaches that may infest structures in Michigan. Smaller cockroaches such as the German Cockroach and the Brown Banded Cockroach are the most common types of cockroaches found inside man-made structures in Michigan. However, you may also get the occasional outside invader such as the American Cockroach or Oriental Cockroach.

Young immature cockroaches look like smaller versions of adult cockroaches without wings. They may live nearly anywhere and eat almost anything, but they prefer carbohydrates over proteins and fats. They feed mainly at night. They can enter facilities through cracks and crevices, but are often brought in with shipped material, groceries, soft-drink cases, used appliances, rugs, furniture, etc.

Many people are allergic to the dust created by cast-off cockroach skins, dead bodies, and droppings. Cockroaches can transmit enteric diseases to humans from bacteria, viral and parasitic diseases that are carried on their bodies that were picked up from areas they travel and congregate.

The coatings on cockroach egg cases often protect them from pesticides, making control more difficult.

German Cockroach Facts:

Appearance: About 5/8” long, light to medium brown, with 2 dark longitudinal streaks on the thorax.

Habits: Nocturnal; primarily infesting areas close to food, moisture, warmth. This is the most common roach found in dwellings, restaurants, and food stores.

Diet: Almost anything.

Reproduction: Females can produce one egg capsule every 20-25 days with each capsule containing 18-48 eggs. Newly born become adults in as little as 36 days and live up to one year.

Other facts: Extremely heavy infestations are not uncommon. Often found aboard ships. Widest distribution of all roaches in the United States.

Pavement Ant – *Tetramorium caespitum*

There are many different ant species in North America, and they come in a wide range of color and sizes. It is very important to identify the species of ant you are dealing with because effective controls vary widely from one species to another. In fact, indiscriminate spraying of Pharaoh ants can actually spread the infestation.

Ants are social insects and live in colonies with as many as 500,000 individuals. They communicate by touch and smell and lay down chemical trails, called a pheromone, so that other ants can find their way from the nest to the food source.

Pavement Ant Facts:

Appearance: About 1/10” (3mm) long, light brown to black in color, appendages lighter than the rest of the body, parallel lines on the head and thorax; antennae with 12 segments.

Habits: Invade structures foraging for food throughout the year. Nests often outdoors under stones or along curbing or cracks in pavement, but can nest indoors in walls and under floors.

Diet: Will eat many things, but prefer greasy and sweet foods.

Reproduction: Queen produces 5-20 eggs per day with brood developing in about 40 days. Young go through three larval stages.

Other facts: Slow moving. A particular nuisance around structures with slab construction, if handled by picking them up, they can bite humans.

Norway Rat – *Rattus norvegicus*

Rats can enter a structure through a hole about the size of a quarter and can cause damage by eating and urinating on food, chewing wiring (causing fires) and carrying diseases like Salmonellosis, Leptospirosis, Plague and Rat Bite Fever. Rats may bite humans or pets.

Rats are nocturnal. They are cautious. If their food is in an exposed area where it can not be consumed quickly, they will drag it to a more suitable spot. They memorize specific pathways and use the same routes habitually. They use their long, sensitive whiskers and the guard hairs on their body to help guide them.

Rats are omnivorous and eat nearly any type of food, including dead and dying members of their own species. They have an excellent sense of taste, enabling them to quickly detect certain compounds, including some rat poisons, even at very low concentrations. Norway Rat Facts:

Appearance: About 6-8” long, weighing about 1 pound; brown heavy bodies: small eyes and ears; blunt nose; tail is shorter than head and body; fur is shaggy; droppings are capsule-like.

Habits: Introduced to North America by European settlers and is now found throughout the contiguous 48 states.

Diet: Will eat many things. Requires ½ to 1 ounce of water daily when eating dry foods, such as grains, but needs less water when eating moist foods. Foraging range is from 50’ to 150’ from the nest.

Reproduction: Litters of 6-12 young are born about 3 weeks after conception. Newborn rats become completely independent at about 3-4 weeks and reach reproductive maturity at 2-3 months of age. The average female will successfully produce about 20 offspring per year.

Other facts: Poor vision, but excellent senses of smell, taste and touch. Rat droppings are black in color, capsule shaped with blunt ends around ¾ inch long.

House Mouse – *Mus Musculus*

The word “mouse” can be traced to the Sanskrit word “musha” which is derived from the phrase “to steal.” In six months, a pair of mice can eat about 4 pounds of food and produce about 18,000 fecal droppings. Mice feeding on colored crayons will produce droppings based on the color of the crayon they were feeding on.

There are about 300 different species of mice in the United States. They can enter a structure through a hole of about ¼ inch in size and they cause damage by eating and urinating on food, chewing wiring (causing fires) and over 200 disease germs have been identified with mice (two of importance in Michigan: Leptospirosis and Salmonella).

Mice will hoard food, so removal of the normal food source may not reduce infestations immediately. In addition, use of granular rodenticides near food preparation areas can present a risk of contamination, since mice may hoard bait that is easily moved, such as granular forms of rodenticide. Glue boards, snap traps, or wind-up multiple catch traps are often quite effective at controlling mice populations. Mice are nocturnal and are cautious, but are less wary of baits and traps than rats are. Mice are omnivorous but prefer grains. Mice get most of their water from moisture in their food, but will drink water if it is available.

House Mouse Facts:

Appearance: About 3-4” long, weighing about an ounce or less; small and slender bodies with large ears and small eyes; pointy nose; droppings are rod-shaped.

Habits: Establishes “territory” generally 30-40’ from the nest; inquisitive, but very wary; excellent climber.

Diet: Omnivorous, prefers cereal grains, seeds, and food crumbs. Mice are nibblers and require 3 grams of food per day.

Reproduction: Prolific breeders at 2 months with litters as often as every 40-50 days with 4-7 per litter; live up to one year.

Other facts: Feeds 15-20 times per day. Mouse droppings are ¼ inch long with pointed ends (sausage shape).

House Fly – *Musca domestica*

Houseflies are the most common flies found in and around structures. They are found throughout the world. Not only are they a nuisance, but they are important carriers of disease. They can harbor over 100 different bacteria, viral, and parasitic disease organisms including typhoid fever, cholera, diarrhea, tuberculosis, and parasitic worms. Disease is spread by the feeding habits of flies which are constantly excreting and regurgitating on food sources.

Flies can walk on vertical planes and can even hang upside-down from ceilings. This is accomplished as a result of a surface tension of liquids that is secreted by glands near the flies' feet.

House Fly Facts:

Appearance: About 1/8 – 1/4" (4 to 7.5 mm) long, dull gray in color with 4 narrow longitudinal stripes on the top.

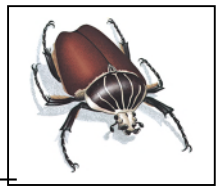
Habits: Flies may be found in areas with organic matter such as garbage areas, kitchens, waste, manure, and filth accumulations. The organic matter may be dead or decaying material, or it may be the food on your lunch plate.

Diet: Houseflies ingest only liquid foods. They salivate on solid foods to predigest it, and then suck it back inside to eat.

Reproduction: Each female fly can lay about 500 eggs in several batches of about 75-150 eggs in organic (usually dead/decaying) material. Larva (maggots) hatch within a day and live about one week as a maggot. After the third instar, they crawl to a cool dry area and pupate, emerging as an adult. Adults live 2-4 weeks. Small flies are not young flies, but are small as a result of getting insufficient food during the larval stage.

Other facts: Flies have a very highly evolved evasion reaction system which makes them difficult to swat and helps to ensure their survival.

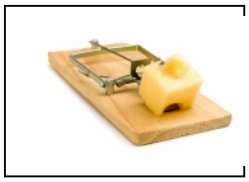
Integrated Pest Management Pest Sighting Log



Facility: _____

To Be Completed by Facility Official			**To Be Completed by Pest Control Manager**		
Specific Location of the Pest Sighting	Type of Pest Sighted & Number of Pests	Date and person's name noting pest	Action(s) taken	Technician Name	Date
Post sighting log in a common area. Retain for IPM Program Manual when the form has been filled in.					

Integrated Pest Management Monitoring Station Record



Facility: _____

Record the number and type of pests found in each monitoring station (glue board) or trap. Monitor or mark insects in glue boards so that they are not counted in the next inspection.

Date	Trap Location	Pest(s) found – type and number – identified by whom

Integrated Pest Management Pesticide Applicator Information

Facility: _____

Record information pertaining to all pesticide applicators who work at this facility.

Applicators must be IPM Trained, which is a one-time requirement, and the credential does not expire.

Applicators must have a current commercial pesticide applicator certification or registration credential if they will be applying pesticides other than general-use ready-to-use products. Certification/registration credentials have an expiration date and must be renewed every third year.

Name of Applicator	Date IPM Training Was Completed	Certification/ Registration Number	Certification Categories	Certification Expiration Date

Pesticide Recordkeeping Form

Contains recordkeeping requirements for IPM and Commercial Pesticide Applicator Recordkeeping

LOCATION & INSPECTION INFORMATION

Location: _____

Date: _____

Pests Noted:

Conditions Conducive to Pest Infestation:

Pest Management Recommendations Made by The Applicator:

Structural or Habitat Modifications Undertaken:

APPLICATION INFORMATION

Name of Pest Control Firm (If Employed) & Emergency Phone Number:

Target Pest(s): _____ **# Of Target Pests Found or Reported:**_____

Name of Applicator:_____ **Applicator Certification #**:_____

Name of Pesticide(s) [Brand or product name]: _____

EPA Reg. #(s): _____ **Active Ingredient(s)**: _____

Concentration of Pesticide(s) Applied (i.e., amount of formulated material & amount carrier used to make the end-use dilution: _____

Quantity of Pesticide(s) Used: _____

Method of Application (ex: pump sprayer, spreader, etc.): _____
Rate of Application (ex: #/1,000 ft^2, to point of run-off, etc.): _____

Restricted Entry Interval: _____

Location Where Pesticide(s) Applied [Written description or map]:

Notes:

Annual Notification of Pesticide Applications

Dear Parent or Guardian:

State of Michigan law requires schools and day cares that may apply pesticides on school or day care property to provide an annual notification to parents or guardians of students attending the facility.

Please be advised the _____ school/day care utilizes an integrated pest management (IPM) approach to control pests. IPM uses a variety of techniques to prevent pests from reaching unacceptable levels or to reduce an existing population to an acceptable level. Pest management techniques emphasize sanitation, pest exclusion, and biological controls. One of the objectives of using an IPM approach is to reduce or eliminate the need for pesticide applications. However, certain situations may require the need for pesticides to be utilized.

As required by State of Michigan law, the school or day care will provide advance notice regarding the non-emergency application of a pesticide such as an insecticide, fungicide, or herbicide, other than a bait or gel formulation, that is made to the school or day care buildings or grounds. Advance notice will be provided, even during periods when not in session. Advance notice is not given for the use of sanitizers, germicides, disinfectants, or anti-microbial cleaners. In certain emergencies, such as an infestation of stinging insects, pesticides may be applied without advance notice to prevent injury to students, but the school or day care will provide notice following any such application.

Advance notice of pesticide applications, other than a bait or gel formulation, will be given by at least two methods at least 48 hours before the application. The first method will be by posting at the main entrance to the school/day care center located at _____. The second method will be by the method checked below:

- ☐ Posting in a public, common area of the school or day care, other than an entrance. We will post in the_____.
- ☐ E-mail.
- ☐ A phone call by which direct contact is made with a student's parent or guardian or a voice message is recorded.
- ☐ Providing students with a written notice to deliver to their parent(s) or guardian(s).
- ☐ Posting information on the school's or day care's website.

Parents or guardians are entitled to receive the advance notice of a pesticide application, other than a bait or gel formulation, by first-class United States mail postmarked at least three days before the pesticide application if requested. If you prefer to receive the notice by first-class mail, please contact _____ at the school office by calling 555-xxx-xxxx.

Parents or guardians may review the school's IPM program and records of any pesticide application(s) upon request. Contact _____ at 555-xxx-xxx or by email at XXXXX@school.net.

Advance Notice of Pesticide Treatment

This notice is to be provided whenever a pesticide, other than a bait or gel formulation, is to be applied at this facility. The information will be posted using the methods identified in the Annual Notification.

Attention: This facility utilizes an Integrated Pest Management Program for pest control, employing non-chemical methods that include sanitation and exclusion to control pests. However, from time to time a pesticide application may be necessary to control certain pests.

Please be advised that a pesticide is expected to be applied to control _____.

The approximate location of this pest control treatment is _____.

The anticipated date of treatment will be _____.

If you have questions pertaining to this treatment, please contact:

Name:

Phone:

E-mail:

For further information pertaining to pesticides, contact the National Pesticide Information Center at 800-858-7378. The website is www.npic.orst.edu. For additional information pertaining to pesticide use, you can contact the Michigan Department of Agriculture and Rural Development (MDARD) at 800-292-3939. The website is www.michigan.gov/mdard.

Review Questions

1. What is Integrated Pest Management? (Preface)

2. What data elements must be included with your recordkeeping? (pg 13 & 14)

3. Who needs to be a certified or registered applicator in Michigan to apply pesticides? (pg 4)

4. Before any pesticide application is made in a public building, school, day care center, or health care facility, two things must take place. What are they? (pg 5)

5. What are the four basic elements required when conducting a site evaluation? (pg 10)

6. Michigan law requires a commercial pesticide applicator to give the building manager a copy of _____ and _____ when making a pesticide application in an IPM regulated facility. (pg 8)

7. The population reduction method includes what three pest control strategies? (pg 11)

8. The pest prevention method includes what two pest control strategies? (pg 11-12)

9. Define biological control and explain how it can reduce pest populations. (pg 2 & 11)

10. Describe habitat modifications that can be taken when pest populations are too high. (pg 12)

11. Provide an example of behavior modification. (pg 12)

12. The toxicity of a pesticide is the capacity of a substance to cause _____. (pg 12)

13. Why should an IPM program be evaluated periodically? (pg 12)

14. What are the responsibilities of a building manager when implementing an IPM program? (pg 9)

15. Why is communication such an important component of an IPM program? (pg 8)