



OHIO UNIVERSITY

**Integrated Pest Management Plan
December 2018**

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What is IPM?

Integrated Pest Management is an effective, economical, and environmentally sensitive approach to pest management. IPM utilizes a decision-making approach that employs biological, cultural, physical, and chemical tactics to manage pests in a way that minimizes risks to humans and the environment.

The core values of IPM include a four-tiered approach: 1) set action thresholds, 2) monitor and identify pests, 3) prevent or remove conditions that attract pests, 4) control.

This involves understanding the pest's habits, life cycle, and needs; monitoring the pest's activity and adjusting methods over time; tolerating harmless pests; and using the least toxic methods first, up to and including pesticides.

Ohio University Campus Context

Ohio University is located within the city of Athens, Ohio, which sits along the banks of the Hocking River in the southeastern portion of the state. The surrounding Appalachian foothills provide a beautiful backdrop for this historic campus known as the oldest university in the northwest territory. Ohio University is known for its brick buildings, towering trees, and striking landscapes.

The campus community is committed to serving as a leading-edge laboratory for sustainability. As such, Ohio University is an AASHE STARS (Association for the Advancement of Sustainability in Higher Education Sustainability Tracking, Assessment and Rating System) member and follows a university-wide Climate Action Plan and Sustainability Plan. The Grounds Department IPM program is a part of this larger effort to promote sustainable practices and assessments across campus.

Grounds Department IPM Methodology

Ohio University's Grounds Department manages landscape and turf pests in order to protect against loss or damage to university plants and to promote a safe and aesthetically-pleasing environment for the campus community. Pests, in relation to grounds management include plant diseases, insects, fungi, bacteria, and weeds.

Expanding upon the 4-tiered approach outlined in "What is IPM?", Ohio University Grounds Department utilizes the following actions:

1. Establish and encourage preventative practices to minimize pest occurrence
2. Follow established threshold levels to decide action steps
3. Identify the pest and associated damages
4. Understand the pest's biology (habits, life cycle, requirements)
5. Identify all control options before acting
6. Determine and apply cultural practices that will inhibit pest growth or spread
7. Use pesticides only when necessary, using lowest amount and least toxic options
8. Monitor pest populations and maintain recordkeeping

All practices are performed in accordance with Ohio Department of Agriculture (ODA) rules and regulations.

Maintenance Levels for Landscape Management

Within Ohio University's 2,137 acres, 494 of these are actively managed. Maintenance levels are delineated into the categories outlined below.

Turf Levels:

Level 1: *Intercollegiate Athletics and Golf:* 5% threshold of weeds tolerated. Athletics fields require ideal turf conditions in order to provide safe and functional playing surfaces. As such, they require some preventative chemical treatment and are monitored closely to minimize the amount of chemical product used. These areas adhere to all Ohio Department of Agriculture regulations.

Level 2: *High Profile areas:* Up to 20% threshold of weeds tolerated before treatment occurs. Level 2 lawns include the high-profile areas such as College Green, East Green Drive, and Richland Avenue.

Level 3: *Medium Profile areas:* 40% or more threshold of weeds tolerated before treatment occurs. Level 3 lawns are areas such as backsides of buildings and non-Level 2 locations; lawns in this area are mowed on weekly basis.

Level 4: *Minimal maintenance areas:* no specific threshold level, however invasive species are to be considered weeds. Spot treatments to be the preferred technique if chemicals are used. Level 4 represents areas such as naturalized, pollinator, and low maintenance fescue plantings that may receive one mowing or less per year.

- Within the larger Level 4 designation exist 11 'Naturalized Areas'. These dedicated areas have been established to provide habitat for beneficial insects, as well as supporting wildlife.

See Appendix 1 for Maintenance Level Map

Hardscape and Landscape Bed Levels:

Unless otherwise designated, all hardscapes and landscape beds in Levels 1, 2, and 3 will generally be maintained as weed-free areas.

Pest Identification and Monitoring

A crucial step in effective pest management is the correct identification of the following:

1. The affected crop and associated damage
 - Consult degree day calendar to optimize monitoring
2. The pest and its life cycle and biology

Next, consider threshold levels and decide if control measures are necessary.

Cultural Practices

In order to minimize the use of chemical pesticides, cultural practices are employed as both a preventative practice to reduce pest occurrence as well as a means to inhibit pest growth or spread.

Cultural Turf Practices include the following:

- Select appropriate grass species, using the latest cultivars that can tolerate various conditions
- Perform regular soil testing to determine fertility needs
- Enhance soil quality and water retention capacity through the addition of soil conditioners such as organic compost amendments, including Ohio University compost and externally-sourced products
- Follow appropriate aeration schedules
- Establish proper mowing heights to encourage healthy turf growth
- Utilize mulching mower blades to return clipping and tree leaf nutrients to the turf

Cultural Landscape Bed Practices include the following:

- Enhance soil quality and water retention capacity through the addition of soil conditioners such as organic compost amendments, including Ohio University compost and externally-sourced products
- Utilize mulch to retain bed moisture, prevent weed growth, and moderate soil temperatures
- Hand weed when possible to reduce use of chemical pesticides
- Select native and adaptive plant species that have low maintenance requirements and possess disease and pest resistant qualities.

Chemical Application Guidelines

When chemical application is deemed necessary, the following conditions must be considered:

- Timing of control applications:
 - Seasonally: turf applications will be scheduled to minimize exposure to student and animal populations on campus. After May graduation is an example of a preferred application schedule.
 - Daily: turf applications should take place in the early morning hours, allowing for safe re-entry interval time for the campus community
- Weather: Wind speed, approaching rain should be considered before application

Other important factors include:

- BMPs concerning pollinators:
 - Avoid times of high bee activity when treating areas surrounding flowering plants
 - Mow flowering weeds prior to turf applications
 - Do not treat flowering trees during periods of bloom
 - Look for bee advisory box with bee hazard icon on pesticide labels
 - Avoid bee-toxic pesticides. See website:
<https://pesticidestewardship.org/pollinator-protection/pesticide-applicator-bmps/>

- Proximity to the root zones of trees and shrubs
- Movement of pesticides from the treatment area. For example, spills on adjacent sidewalks must be cleaned up immediately to avoid tracking by pedestrians or contamination of storm water

In following all ODA regulations, particular attention should be given to any potential effects on non-target plants and waterways. This includes chemical drift, volatilization, or runoff.

Pesticide Storage and Disposal

The Grounds Department follows ODA laws and rules regarding safe storage and disposal practices. See here for Chapter 901:5-11 Pesticides- Ohio Laws and Rules: <http://codes.ohio.gov/oac/901%3A5-11>

Pesticides must be stored in original containers and held in a secure and clearly signed location. Always refer to "Storage and Disposal" section on the pesticide label, and the Safety Data Sheet for basic disposal instructions.

Excess pesticides as well as tank and container rinsates should never be discarded in a storm or sanitary drain. To avoid waste, mix appropriate quantities and use all material by application according to label directions. If excess cannot be avoided, follow manufacturer's instructions for temporary storage or disposal.

For container disposal: triple rinse and empty into application equipment, then disable containers and send to campus recycling or sanitary landfill. In case of minor spills or leaks, soak up with sand, earth, or other suitable material and dispose of waste and broken or empty containers in a sanitary landfill.

For any pesticides that cannot be disposed of in a sanitary landfill per label requirements: contact Ohio University Safety Department.

Notification and Recordkeeping

The Grounds Department follows all Ohio Department of Agriculture pesticide notification regulations. This includes placement of signs at edges and throughout treatment area. Signage must follow ODA size standards and include Support Services Work Center phone number. Signage must remain until re-entry interval indicated on chemical label has been exceeded.

Accurate recording with required information must be filled out upon treatment completion. Records must be held for a period of three years from date of application.

*This is particularly important with respect to children on campus (such as summer programs including Kids on Campus, Camp Boot, and Ping Summer Camp). Grounds Managers should have knowledge of children's programming times and locations when planning treatment schedules.

Pesticides Phased Out of Use

Ohio University Grounds Department has committed to end the use of all pesticides that carry the “danger” level warning signal. As part of this effort, the common herbicide Three-Way has been phased out. Grounds will annually review their product line up to ensure use of the safest and least toxic options.



DANGER. This means that the product is **highly toxic by at least one route of entry into the body**. Products with this Signal Word can cause severe eye damage or skin irritation. **PELIGRO**, the Spanish word for DANGER must also appear on the label.



WARNING. This means that the product is **moderately toxic** either orally, dermally, or through inhalation, or it causes moderate eye and skin irritation. **AVISO**, the Spanish word for WARNING, must also appear on the label.



CAUTION. This means that the product is **slightly toxic** orally, dermally, or through inhalation, or it causes slight eye irritation.

Figure 1: Pesticide Signal Words and definitions

Landscaping to Support Biodiverse Habitats

Operations are grounded in ecological stewardship principles that support healthy and diverse ecosystems. As such, the Grounds Department is committed to creating and maintaining landscapes that support a range of beneficial insects and other wildlife. Some examples include:

- Plant preference will be given to a diverse mix of native species when possible
- Creation of naturalized areas, as outlined in the Maintenance Level Map
 - Chemical use in these areas is minimal, limited to practices such as invasive species control
- Use of educational signage to highlight sustainable grounds practices on location, such as:
 - Cicada Killer Wasp nesting sites: signage used to spread awareness about this insect’s role in the ecosystem
 - Naturalized plantings: identify these areas as a lower maintenance level and list their environmental benefits
- Establishment of monarch butterfly food plots and habitat in response to declining populations
 - **These efforts have resulted in the observed presence of adult and larval feeding in these dedicated areas
- Consider species listed as endangered or threatened that might be impacted by Groundskeeping activities
 - For example, annual mowing in Level 4 areas must occur prior to the arrival of nesting birds in the spring

Licensing, Training, Education

Education of Grounds staff is crucial for effective and impactful integrated pest management practices. Current staff training includes:

Initial and annual training. All Grounds Employees are required to obtain an Ohio Department of Agriculture Pesticide Applicators License in three categories within 120 days of hire as well as maintain annual certification which involves additional training. This certification keeps employees current with proper techniques, safety requirements and best practices. Staff also receive recurring training in best practices concerning storm water management and protection as well as other environmental regulations.

Additional training. The Grounds Department provides Groundskeepers with specialized trainings, often involving hands-on opportunities. Demonstrations have covered tree treatments such as Emerald Ash Borer, Dutch Elm Disease, and Hemlock Woolly Adelgid prevention.

Ohio University Grounds Managers attend various continuing education events covering all aspects of the Landscape and Turf Maintenance field to keep staff abreast of Best Management Practices and latest research recommendations. Grounds Managers also network closely with landscape, turf, and entomology experts, colleagues, and vendors across the country.

Future Improvements

The Grounds Department will continually evaluate its processes to find the safest, least toxic practices possible. Current examples include:

- Use of non-herbicidal weed killer such as Mirimichi Green and corn gluten
- Seeding microclover into fescue lawns to reduce chemical fertilizer needs
- Continued improvement of Ohio University compost composition to enhance growing conditions for turf and landscape plants
- Pursue further research of organic and non-toxic products related to pest control
- Increased education and training for staff
- Continue to expand naturalized areas across campus

Appendix 1: Maintenance Levels for Landscape Management

