

UNIVERSITY OF RICHMOND

INTEGRATED PEST MANAGEMENT (IPM) PLAN

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INTRODUCTION

Pests are populations of living organism (animals, plants, or microorganism) that damage property or interfere with the aesthetics or use of University facilities for human purposes.

Integrated Pest Management (IPM) establishes a sustainable approach to managing pests by combining biological, cultural, physical and chemical tools in a way that minimizes economic, health and environmental risks.

The University of Richmond has adopted this Integrated Pest Management Plan for the landscape and grounds the University manages. The plan outlines procedures to be followed to protect the health and safety of students, faculty, staff, and visitors from pest and pesticide hazards. The plan is designed to voluntarily comply with policies and regulations promulgated by the Department of Agriculture for public buildings and university facilities.

Objectives of this IPM plan include:

- Elimination of significant threats caused by pests to the health and safety of students, faculty, staff and the public.
- Prevention of loss or damage to landscapes or property by pests.
- Protection of environmental quality inside and outside buildings.

The goal of Integrated Pest Management is often not total elimination of a pest. That is unrealistic. The goal is to minimize the problem to an acceptable level.

This IPM plan will be stored in the office of the Landscape Department.

IPM COORDINATOR

The Associate Director of Landscape Services or designee shall be the University of Richmond's IPM Coordinator and be responsible to implement the IPM plan and to

coordinate pest management-related communications between the University of Richmond, service providers, faculty, staff and students.

ANNUAL REVIEW

This IPM Plan will be reviewed and revised annually by the IPM Specialist, Associate Director of Landscape Services and the Manager of Landscape Services, with input from the University's Sustainability Manager and representatives of the Virginia Cooperative Extension Service.

POSTING AND NOTIFICATION OF PESTICIDE APPLICATIONS

All students, faculty, and staff will have access to pesticide application information through the University's Facilities Department website, <https://facilities.richmond.edu>.

Use of a least toxic pesticide does not require notification. If pesticides other than least toxic pesticides are used, building occupants will be notified not less than 72 hours before the pesticide is applied on surrounding grounds under normal conditions, and within 24 hours after application of a pesticide in emergency conditions (LEED 2013). Information on indoor pesticide applications is available from the University's Custodial Department.

RECORD KEEPING & PUBLIC ACCESS TO INFORMATION

The University of Richmond will maintain records of all Landscape Department pest control treatments for at least three (3) years. Information regarding pest management activities will be made available to the public at the University of Richmond Landscape Department office.

TRAINING

All pesticide application staff will attend training required to maintain certification with the Virginia Department of Agriculture and Consumer Services. Periodic information and question/answer sessions may be offered to interested faculty, staff, and students to provide an overview of the University's Integrated Pest Management activities.

GENERAL IPM STRATEGIES

Pest management strategies may include education, exclusion, sanitation, maintenance, biological and mechanical controls, and pre-approved, site-appropriate pesticides.

An Integrated Pest Management decision at the University of Richmond shall consist of the following steps:

1. Identify pest species.
2. Estimate pest populations and compare to established action thresholds.

3. Select the appropriate management tactics based on current on-site information.
4. Assess effectiveness of pest management.
5. Keep appropriate records.

Decisions concerning whether or not pesticides should be applied in a given situation will be based on a review of all available options. Efforts will be made to avoid the use of pesticides by utilizing Integrated Pest Management strategies including adequate pest proofing of facilities, good sanitation practices, selection of pest-resistant plant materials, and appropriate horticultural practices.

When it is determined that a pesticide must be used in order to meet pest management objectives, the least-hazardous material, adequate for the job, will be chosen.

All pesticide storage, transportation, and application will be conducted in accordance with the requirements of the Federal Insecticide, Fungicide, and Rodenticide Act (7 United States Code 136 et seq.), Environmental Protection Agency regulations in 40 CFR, Occupational Safety and Health Administration regulations, University of Richmond policies and procedures, and local ordinances.

No person shall apply, store, or dispose of any pesticide on University of Richmond-managed property without an appropriate pesticide applicator license or being a trainee under the direct on-site supervision of a certified Commercial Pesticide Applicator. All pesticide applicators will be trained in the principles and practices of IPM and the use of pesticides approved for use by the University. All applicators must comply with this IPM policy and follow appropriate regulations and label precautions when using pesticides in or around University facilities. Outside contractors who are utilized when large areas need to be treated will adhere to these requirements and products used will be approved by the Associate Director of Landscape Services and/or the Integrated Pest Management Specialist.

PEST-SPECIFIC STRATEGIES

The following strategies will be used for frequently encountered pests:

Weeds in Mulch Beds

Threshold: Any

1. When possible, pull or dig weeds up manually, being sure to remove root material, before the weeds are mature enough to produce seeds.
2. Apply pre-emergent weed preventer, such as FREEHAND™ or SNAPSHOT™ granules according to label directions, to all beds February-April and June- July. This is most effective if applied to bare ground before re-applying mulch, and watered in thoroughly. All granules

will be immediately swept or blown off of sidewalks, patios, roads, etc. before the applicator leaves the treatment area.

3. Maintain 2-4 inches of clean mulch cover to inhibit weed growth and retain moisture.
4. When applying dye such as Mulch Magic to mulched areas, a pre-emergent weed preventer, such as PRODIAMINE 65WDG™ (Prodiamine 65%) mixed 0.55 oz per gallon of water may be added to the dye mix, for areas where granular pre-emergent weed preventer has not yet been applied for the season.

Nutsedge or broad-leafed weeds in ornamental grass such as lirioppe (see #1,2,3 above):

When manual removal is not practicable, spot treat as early as possible with a selective herbicide labeled for nutsedge and broad-leafed weed control, such as PROSEGE™ (Halosulfuron 75%) mixed 0.9gram per gallon of water. Manual removal of nutsedge is seldom effective, due to extensive underground rhizomes.

Grassy weeds in ornamental grass such as lirioppe (see #1,2,3 above):

When manual removal is not practicable, spot treat as early as possible with a selective grassy weed herbicide such as FUSILADE II™ (Fluazifop 24.5%) mixed 0.5 ounces per gallon of water plus 0.5 ounces of nonionic surfactant per gallon of water. Manual removal of bermuda grass is seldom effective, due to extensive underground rhizomes.

Broad-leafed or grassy weeds in open mulch areas (see #1,2,3 above):

When manual removal is not practicable, spot treat as early as possible with a non-selective herbicide, such as glyphosate 41% mixed 2.6 ounces per gallon of water.

Broad-leafed or grassy weeds in sidewalk cracks, curbs, patios.

Threshold: Any

When manual removal is not practicable, spot treat as early as possible with a mixture of both a non-selective weed killer and a pre-emergent weed preventer, such as 2.6 ounces of glyphosate 41% plus 0.55 ounces of PRODIAMINE 65WDG™ (Prodiamine 65%) per gallon of water.

Poison Ivy near walkways and parking lots

Threshold: Any

When manual removal is not practicable, spot treat as early as possible with an herbicide labeled for poison ivy control, such as CROSSCUT™ (Triclopyr 16.5% +2,4-D 34.4%) mixed 3 ounces per gallon of water.

Weeds in turf areas

General turf areas

Weed thresholds are high in general turf areas. The need for pre- and post-emergent herbicide applications may be made on a case by case basis.

High priority warm-season turf areas including athletic fields - Bermuda, Zoysia such as the Soccer Field, Football Practice Fields, President's Circle, etc.

Cultural practices such as spring fertilization in accordance with the *Warm Season Nutrient Management Plan for the University of Richmond*, and aeration and over-seeding can improve turf health, thereby minimizing opportunities for weeds to establish.

Apply pre-emergent weed preventer such as 0-0-7 1% RONSTAR™ (Oxadiazon 1%) at the rate of 300lbs per acre. Granular pre-emergent herbicides should be thoroughly watered-in with at least ½ inch rainfall or irrigation. DO NOT apply pre-emergent weed preventer within 90 days prior to over-seeding. Consult the product label to insure non-interference with future over-seeding operations. All granules will be immediately swept or blown off of sidewalks, patios, roads, etc. before the applicator leaves the treatment area.

As bermuda grass goes dormant, winter rye grass is seeded to maintain a playable surface on the soccer field. In the Spring, the rye grass is treated with appropriate products such as a mixture of MANOR™ (Metsulfuron Methyl 60%) and MONUMENT™ (Trifloxysulfuron-sodium 75%) at label-prescribed rates in order to prevent the rye grass from interfering with the bermuda grass turf as it comes out of dormancy.

When broad-leafed weeds appear, spot treat with a broad-leafed weed killer such as 4 SPEED™ mixed 0.5 - 0.75 ounces per gallon of water to treat 1000 square feet. The higher rate can be used on dormant turf. Use the lower rate when warm season turf is actively growing. Any treatment during the transition period can result in turf damage. Consult the product label to insure non-interference with future over-seeding operations.

High priority cool-season turf areas – Fescue (Front Wall, ...)

Cultural practices such as fall fertilization in accordance with the *Cool Season Nutrient Management Plan for the University of Richmond*, and aeration and over-seeding can improve fescue turf health, thereby minimizing opportunities for weeds to establish.

Apply a split application of pre-emergent weed preventer such as a turf fertilizer containing BARRICADE™ (Prodiamine) according to the

manufacturer's label directions. The first application should be made in early March and the second application in mid-May. Granular pre-emergent herbicides should be thoroughly watered-in with at least ½ inch rainfall or irrigation. **DO NOT** apply pre-emergent weed preventer within 90 days prior to over-seeding. Consult the product label to insure non-interference with future over-seeding operations. All granules will be immediately swept or blown off of sidewalks, patios, roads, etc. before the applicator leaves the treatment area.

When broad-leafed weeds appear, spot treat with a broad-leafed weed killer such as 4 SPEED™ mixed 0.75 – 1.5 ounces per gallon of water to treat 1000 square feet. **For fine fescues such as creeping red or Chewing's, DO NOT apply until the turf is 3 years old, and use the lower mix rate.**

Insects, fungus, and other diseases damaging ornamental plants

Prevention is the primary method of pest and disease control, including:

Choosing plant varieties that are hardy and well-suited to the micro-environment where they will be placed.

Inspecting new plants prior to planting to insure they are healthy.

Amending soil in planting areas as indicated by soil testing, to provide optimum conditions for plants to thrive, making them more resistant to diseases. Critical factors include maintaining optimum soil pH and nutrient balance for the specific plants.

Placing ornamental plants with sufficient space around them for adequate light and air circulation in their mature size.

Assuring adequate water and fertilizer are applied to keep plants healthy and resistant to attack.

Careful pruning and clean-up of clippings.

Cleanup of pruning tools with isopropyl alcohol to prevent spread of insects, fungi, and other diseases.

Early detection and quick treatment is essential to minimize the need for pesticide application. In addition to periodic surveys by the Integrated Pest Management Specialist (IPMS), ornamentals plants will be checked by all landscape staff who will alert the IPMS to suspected problems including spotting and yellowing of leaves, leaf drop, or other visible evidence of pests or disease.

Lacebugs damaging azaleas or rhododendrons:

Threshold: Significant stippling and yellowing of leaves

If the infestation affects small areas, portions of plants, apply contact insecticide such as insecticidal soap or horticultural oil mixed with water according to the manufacturer's label. If needed, repeat applications at 2-week intervals.

If the infestation is severe or does not subside after repeated treatment with insecticidal soap or horticultural oil, apply a foliar contact insecticide such as PERMETHRIN SFR™ (Permethrin 36.8%) mixed ½ tsp per gallon of water in the spring when pupae are emerging and adult flies are present. **This pesticide is highly toxic to bees exposed to direct treatment or residues on crops or weeds. Do not apply this product or allow it to drift to crops or weeds on which bees are actively foraging.**

Leaf miners in boxwoods:

Threshold: Noticeable leaf damage.

Apply foliar contact insecticide such as PERMETHRIN SFR™ (Permethrin 36.8%) mixed ½ tsp per gallon of water in the spring when pupae are emerging and adult flies are present. **This pesticide is highly toxic to bees exposed to direct treatment or residues on crops or weeds. Do not apply this product or allow it to drift to crops or weeds on which bees are actively foraging.**

Japanese Beetle Grubs in turf:

Threshold: 10-12 grubs per square foot (cut and peel back the sod layer to inspect during July - August)

Apply appropriate insecticide in accordance with the manufacturer's label directions.

Fruit Trees

Preventive treatment is important for successful fruit production. Detailed instructions are available in Virginia Cooperative Extension Publication 422-023 *Growing Apples in Virginia*. Products needed will include dormant oil, fungicide such as IMMUNOX™ (Myclobutanil 1.55%) mixed ½ oz per gallon of water and insecticide such as PERMETHRIN SFR™ (Permethrin 36.8%) mixed ½ tsp per gallon of water may be used according to the following schedule:

| <u>Growth Stage</u> | <u>Timing</u> | <u>Pest</u> | <u>Treatment</u> |
|------------------------------------|--|---------------------------|--------------------------|
| Dormant | Early April above 40°F | Insect eggs | Dormant oil |
| Green tips | Leaves out 1/8 inch | Insects, Fungi | Permethrin, Myclobutanil |
| Tight cluster | Flower buds tight | Insects, Fungi | Permethrin, Myclobutanil |
| Blooming | | (No spraying, harms bees) | |
| Post-bloom | Petals are falling | Insects, Fungi | Permethrin, Myclobutanil |
| 10 days later | | Insects, Fungi | Permethrin, Myclobutanil |
| 10 days later | | Insects, Fungi | Permethrin, Myclobutanil |
| Every 12 – 14 days thru mid-August | | Insects, Fungi | Permethrin, Myclobutanil |
| | (If lots of rain, do this after 10 days from last spray) | | |

Aquatic Pest Control

Prevention is the key to the control of algae and weeds in Westhampton Lake. Careful adherence to the University's Nutrient Management Plan (Moyer, 2013) will reduce algae and weed problems due to runoff of excess fertilizer from the landscape within the lake's watershed.

Periodic draw-down of the water level will be used to reduce the populations of certain nuisance aquatic weeds.

If chemical application is needed, the least aggressive products will be used that achieve an acceptable level of control.

Algae

Threshold: When algae is evident. It is critical to treat *Chara* and *Phormidium* at the first signs of algal bloom.

Apply algaecide such as K-TEA™ (Copper hydroxide 12.9%) at a rate of 0.7 to 3.4 gallons per acre-foot to visible algae populations. Use the lower rate for planktonic algae, and the higher rate for mats of filamentous algae.

Duckweed and other floating and emerged weeds:

Threshold: When duckweed covers 10% or more of the lake surface.

Apply aquatic herbicide such as REWARD™ (Diquat dibromide 37.3%) mixed at a rate of 1.5 to 3.0 ounces per gallon of water for water depths of 2 to 4 feet. Floating mats of vegetation may require retreatment after 24 hours.

ADD MORE PESTS AS APPROPRIATE.

References:

IPM Institute of North America, Inc. *Principles and Practices of Integrated Pest Management* 211 S. Paterson Street, Suite 380, Madison, Wisconsin 53703 USA, 608-232-1410 Fax 608-232-1440

[IPM Institute of North America What is Integrated Pest Management?](#) (Last accessed on January 10, 2022).

LEED 2013, *LEED Reference Guide for Building Operations & Maintenance v4*, U.S. Green Building Council.

Moyer, Allison (2013) *Nutrient Management Plan Prepared for University of Richmond*, Commonwealth of Virginia Department of Conservation and Recreation.

Virginia Cooperative Extension Service (2020) *Growing Apples in Virginia*, Publication 422-023. Produced by Communications and Marketing, College of Agriculture and Life Sciences, Virginia Polytechnic Institute and State University.

<http://pubs.ext.vt.edu/422/422-023/422-023.html> (Last accessed on January 10, 2022)

Virginia Cooperative Extension Service (2013) *Pest Management Guide – Horticultural & Forest Crops 2021*. Virginia Tech and Virginia State University, National Institute for Food and Agriculture, United States Department of Agriculture,

<https://www.pubs.ext.vt.edu/456/456-017/456-017.html> (Last accessed on January 11, 2022)

Virginia Cooperative Extension Service (2019), *Integrated Pest Management for Vegetable Gardens*, https://www.pubs.ext.vt.edu/content/pubs_ext_vt_edu/en/426/426-708/426-708.html (Last accessed on January 11, 2022).