

2022 PARKS DIVISION PESTICIDE REPORT

POLICY REGARDING PEST MANAGEMENT ON CITY PROPERTY Policy Adopted 5/18/2004

1. The purpose of this policy is to eliminate or reduce pesticide use to the greatest possible extent. The City of Madison agrees with the US EPA that “all pesticides are toxic to some degree, and the commonplace, widespread use of pesticides is both a major environmental problem and a public health issue.” For this reason, all departments will evaluate and give preference to non-pesticide management practices and use reasonably available alternative pest control methods, will minimize their pesticide use through Integrated Pest Management, and will use least risk pesticides as a last resort.
2. Definitions of terms used in this policy.
 - a. Integrated Pest Management (IPM) is a decision making process. The essential parts of IPM are monitoring, setting threshold levels for pests, identifying the causes of the pest problem, addressing the cause of the problem, and using the most effective, least harmful, methods to control the problem, before using chemical controls. IPM develops ways to change the conditions that cause the pest problem, so that pests will be prevented in the future or minimized. Preventive maintenance using pesticides for pest problems does not adhere to IPM. Prevention of pests should be managed with non-toxic methods.
 - b. Biological Controls – support or introduction of natural predators or parasites of the pests to be controlled.
 - c. Cultural Controls - practices that can reduce pests by making the environment less favorable, such as improved sanitation or horticultural practices.
 - d. IPM Coordinator – Department staff person who is responsible for developing and implementing the pest management plan for the Department.
 - e. Mechanical Controls - direct measures that either kill the pest or make the environment unsuitable for their entry, dispersal, or survival, such as tilling the soil to expose insects or hand pulling weeds.
 - f. Physical Controls - practices that physically keep pests from places where they're not wanted, such as window screens and sealing cracks and crevices.
 - g. Pesticides – substances that destroy or repel pests. For the purpose of this document, they include herbicides, insecticides, fungicides, and rodenticides.
3. Chemical pesticide may be considered if:
 - a. The non-toxic methods of pest control, such as Cultural Controls, Physical Controls, Mechanical Controls, and Biological Controls have been shown to be ineffective; and,
 - b. Monitoring has indicated that the pest will cause unacceptable health or safety hazards, or an unacceptable reduction in the intended use of the property.
4. All departments will maintain appropriate records on pest monitoring data collected, pest control actions attempted (both non-chemical and chemical), and results of pest control activity. All departments will submit by February 1st an annual report to the Public Health Commission. This report will contain the following information:

- a. Completed Pesticide Application Summary for all pesticide applications made in the previous year. Application data must include: purpose, location, and amount of each pesticide product applied, including the amount of active ingredient.
 - b. Annual summary of non-chemical pest control activities.
 - c. Estimated size of the total area managed for each pest problem in a given year. The area managed will likely exceed the area treated.
 - d. A summary of any complaints received regarding use or the perceived need for use of pesticides, including the date complaint(s) was (were) received and the nature of the complaint(s).
 - e. A pest management plan for the coming year. The plan will contain the following information for each type of pest problem:
 1. Definition of Roles. Identify who will: serve as the IPM Coordinator, perform pest monitoring, evaluate pest control alternatives, decide which pest control alternative to use, and implement pest control measures.
 2. Pest Management Objectives. Identify the action thresholds (i.e., pest population levels) to be used to decide when some type of action should be taken to control the pest problem.
 3. Monitoring Plan. Describe the methods to be used to monitor the pests and the frequency of monitoring.
 4. Control Method Selection. Describe the types of pest control methods to be evaluated and the criteria used to choose the appropriate control method. IPM control methods may include:
 - i. Modifying the environment to increase the effectiveness of biological, mechanical, cultural, or physical controls such as blocking mouse holes, keeping areas clean where insects may be attracted, improving soil health, etc.
 - ii. Destroying pests breeding, feeding, or shelter habitat.
 - iii. Using pest resistant varieties of seeds, ornamentals, trees, etc.
 - iv. Using chemical control strategies as a last resort only after a mix of other strategies is shown to be ineffective.
 - v. Using mechanical methods and biological methods (parasites, predators, disease).
 - vi. Spot-treating pest problems when chemical methods are used.
 - f. Parks Division Pesticide Report A standard notification plan that provides, at a minimum, readily visible posting for a period of 24 hours prior to a pesticide application (when possible) and a minimum of 48 hours following the application. These time intervals may be extended based on health or safety concerns. For areas that receive pesticide applications on a regular basis, permanent signs will be posted
5. Annual evaluation of pest management activities on City property will be performed in the following manner:
- a. Public Health Department staff will summarize pest management activities. This summary and individual Department reports and plans will be provided to the Pest Management Advisory Subcommittee of the Public Health Commission and the oversight commission of each department applying pesticides.

- b. The Pest Management Advisory Committee, a commission of experts to be recommended by the Public Health Department and appointed by the Mayor's office, shall review the annual report and make recommendations to the Public Health Commission, will:
 - 1. Review the available data and make recommendations concerning compliance with this Policy to the Public Health Commission.
 - 2. Following review of the available data a list of pesticides acceptable for use on city property will be generated.
 - 3. Report any contractors that are not complying with this policy to the Public Health Commission.
 - c. The Public Health Commission will submit recommendations and concerns to each commission charged with oversight of a department that applies pesticide on City property. The public Health Commission will also forward to the Purchasing Supervisor of the Comptroller's office the names of any contractor that does not comply with the City's pesticide policy.
 - d. The oversight commission of each Department with a need to manage pests on City property will have the following responsibilities:
 - 1. Review the Department's pest management activities and plans,
 - 2. Consider recommendations and concerns from the Public Health Commission, the Common Council, and the public.
 - 3. Take appropriate action to ensure that the Department's pest management activities and plans are in compliance with this Policy
6. All Departments with a need to manage pests on City property will assign a staff person to serve as IPM coordinator. This person will be responsible for developing and implementing the Department's plan.
- a. IPM Coordinators from all Departments will be required to meet annually to discuss past experiences and recent advances in pest management practices. The group may choose to meet more frequently as needed.
 - b. IPM Coordinators will receive IPM training.
7. All Departments will report any complaints regarding health effects possibly related to pesticide applications to the Public Health Department at the earliest opportunity.
8. Any unusual amount of pesticide use due to unusual circumstances will be reported to the Director of Public Health or his/her designee at the earliest opportunity.
9. The IPM Coordinator and all supervisors having responsibility for the handling, application, disposal or storage of pesticides shall be State certified under the Department of Agriculture, Trade and Consumer Protection's Pesticide Applicator Certification Program for the appropriate type of pesticide application engaged in. All employees and volunteers applying pesticides shall be State certified or working under the direct supervision of a certified applicator. All employees having any involvement with pesticide handling, application, disposal or storage shall receive basic training in pesticide safety.

10. All Departments storing, using and disposing of pesticides and pesticide containers will do so safely, according to label directions and any State and Federal regulations where applicable.
11. If the pest control program is performed through a private contractor, the contracts for these services will require the contractor to comply with this policy. The contractor must furnish the IPM Coordinator for the Department served with the following for each pesticide applied:
 - a. Date, purpose, location, amount of product, and amount of active ingredient for each application.
 - b. Product labeling and material safety data sheets for each product applied,
 - c. Documentation of applicator certification and conformance with other Federal and State laws.

Monitoring should not be solely performed by the contractor hired to treat the pest problem. The IPM Coordinator should oversee the monitoring.

12. If a private contractor is found to be out of compliance with this policy by the Pest Management Advisory Subcommittee, this non-compliance will be considered grounds for terminating an existing City contract with the contractor and the contractor will not be allowed enter into a contract with any City department for 1 year after the date that non-compliance was determined.
 - a. A list of non-compliant contractors will be kept by the Purchasing Supervisor. The Purchasing Supervisor shall notify all IPM coordinators of non-compliant contractors.
13. This policy does not apply to disinfectants used in the routine maintenance of city facilities.
14. The City shall NOT USE pesticides to control dandelions and other broadleaf weeds on general parklands, median strips, street terraces, roadsides, general lawn areas, and athletic fields that are not reserved, nor are fees paid for their use.
 - a. Guidelines for Pesticide Use
 1. Cosmetic use of lawn and garden areas (including medians) will be managed using non-toxic methods. These methods can be sought out and used on all city properties.
 2. Because of concern over the health of children with repeated exposure to pesticides when playing sports, lower priority athletic fields in particular should have a much higher tolerance for weeds and should use non-toxic weed management methods if desired.
 3. Golf courses have the opportunity for pesticide reduction by incorporating more cultural method and increasing weed tolerance of golfers through educational efforts, following guidelines set forth by the Audubon Golf Sanctuary Program.
 4. Olbrich Gardens and other city property managing large garden areas ought to continually seek out resources for non-toxic garden management.

5. An Integrated Pest Management professional ought to be used as a resource by the city to help coordinate and integrate non-toxic pest management methods.
6. All use of pesticides for conservation purposes for the control of invasive species, must be managed by the conservation supervisor and comply with all other aspects of the pest management policy including reporting and posting requirements. No pesticide will be used for conservation management in areas dedicated for use by children.

15. Any use of a pesticide under EPA Special Review is prohibited.

Pesticide Report – Parks Division 2022

The I.P.M. Coordinator for the Parks Division is Assistant Parks Superintendent, Lisa Laschinger. She can be reached at 608-266-9214. The Parks Division consists of several Sections; each Section Supervisor is responsible for complying with the City's Pesticide Policy. The Section Supervisors are also responsible for following the guidelines of Integrated Pest Management, establishing thresholds, considering alternative control measures, the proper application of any pesticide, and all record keeping as required.

The Park Division is happy to report that their 2021 Annual Report was reviewed by Public Health of Madison and Dane County. The 2021 report was also reviewed by the Habitat Stewardship Subcommittee in 2021, and Parks is compliant with the policy and regulations.

GENERAL PARKS

General Parks, divided into Central, East and West Parks, is comprised of a wide variety of properties with various uses. This includes small neighborhood parks, area parks, community parks, regional parks, natural areas, medians, bike paths, and specialty areas such as tennis courts, disc golf, football, soccer, baseball and softball fields. Total land managed by General Parks is in excess of 4,000 acres.

Parks is thankful to all of the volunteers that assisted us in our non-pesticide control efforts throughout the year. The list of groups and organizations that provides this valuable stewardship assistance is far too great to list without missing critical partners. The projects included flower gardening, natural area restoration, prairie maintenance and establishment, as well as removal of invasives, such as buckthorn, honeysuckle and garlic mustard, etc., from many park areas. Volunteers in both general and conservation parks provided approximately several thousand hours of labor for mechanical and cultural control in 2022!

The Parks Division uses a number of practices to maintain our parks year-round. We are conservative in our use of pesticides and aim to use them only where reservation fees are collected (ie. athletic fields, shelters and immediately adjacent spaces) and in natural areas to control invasive species. In some cases, we use pesticides to control weeds in our highest use areas because heavy landscaping makes hand weeding very time-consuming and less efficient. We continue to work to enhance the surfaces of our athletic fields, as use and consequent wear of the fields continue to increase each year. We constantly strive to balance competing needs and demands of diverse user groups, constituents, and policy makers in all services provided. Any staff applying herbicides are trained and certified in the appropriate State of WI Commercial

Pesticide Applicator category, as are any volunteers that apply herbicides. When contractors are hired for Land Management projects, they too must be licensed and certified in the appropriate category.

INVASIVE WOODY SPECIES CONTROL

Targeted Species: Buckthorn, honeysuckle, boxelder, black locust, poison ivy, sumac, privet, elm, mulberry, Asiatic bittersweet, maple, willow, ash, hawthorn and euonymus.

Purpose: To control invasive woody species growing in landscaped beds, managed meadows, overgrown natural areas, park borders, athletic fence lines, and natural shoreline buffers.

Locations: Applied as cut stump treatments or spot foliar treatment. Apple Ridge, Bear Mound, Beld Street Triangle, Bordner, Cypress, Demetral, Door Creek, Elvehjem, Everglade, Flagstone, Garver, Giddings, Hill Creek, Hudson, Huegel, James Madison, Lake Edge, Maple Prairie, Marshall, Mayfair, McCormick, Nesbitt Open Space, Odana Park, Portland, Raymond Ridge, Tenney, Waltham, Warner, West Haven Trails, Wingra

Pesticides Applied For Invasive Woody Species Control:

Products Used	Active Ingredient (A.I.)	Total Amount of A.I. Used
Pathfinder II Garlon 4 Element 4 Vastlan	Triclopyr	7.1986 pounds
Clash	Diglycolamine	0.044 pounds
Polaris AC	Isopropylamine	0.0113 pounds
Escort	Metsulfuron methyl	0.1152 pounds

HERBACEOUS WEED CONTROL

Targeted species: Weedy grasses and broadleaf annual and perennial weeds, including teasel, burdock, Japanese knotweed, tansy, dame's rocket, garlic mustard, Canadian thistle, bird's-foot trefoil, crown vetch and wild parsnip.

Purpose: To control weed populations in areas that park users rent and reserve, which include athletic fields, ball diamonds and areas of park shelters, fence lines, adjacent parking lots, basketball and tennis courts, and landscaped planting beds. Also to control invasive species in newly established managed meadow plantings.

Locations: Spot treatment and foliar applications were made at Apple Ridge, Beld Street Triangle, Bernie's Beach, Bowman, Brentwood, Brittingham,

Burrows, Cardinal Glenn, Carpenter-Ridgeway, Central/West, Cypress, Demetral, Door Creek, Elvehjem, Emerson, Esther, Flad, Flagstone, Forest Hill, Garner, Giddings, Goodman, Hawthorne, Heritage Heights, Hiestand, Highland Manor, Highlands East, Hill Creek, Honeysuckle, Hoyt, Huegel, Indian Hills, James Madison, Kennedy, Kerr McGee, Lake Edge, Law, Marshall Park, Mayfair, McClellan, Meadow Ridge, Monona, North Star, Oak Park Heights, Olbrich, Olin, Olive Jones, Orton, Portland, Raymond Ridge, Reindahl, Rennebohm, Reston Heights, Sandstone, Secret Places, Sheridan Triangle, Spring Harbor, Sunset, Swallowtail, Sycamore, Tenney, Thousand Oaks, Vilas, Waltham, Warner, Washington Manor, Whitetail Ridge, Wingra, Wingra Creek Parkway, Yahara River Parkway, and Yahara Golf

Pesticides Applied For Herbaceous Weed Control:

Products Used	Active Ingredient (A.I.)	Total Amount of A.I. Used
Ranger Pro Roundup Custom	Glyphosate	49.793 pounds
Snapshot	Trifluralin Isoxaben	2.724 pounds 0.681 pounds
Polaris AC	isopropyl amine salt of Imazapyr	0.1336 pounds
Intensity	Clethodim	0.415 pounds
4-Speed	2-4D 2 Methyl/4 Chloro Dicamba Pyraflufen	0.2857 pounds 0.0071 pounds 0.0285 pounds 0.0006 pounds
Horsepower	2-Methyl-4-Chlorophenoxyacetic Acid 3,5,6-Trichloro-2-Pyridinyloxyacetic Acid 3,6-Dichloro-o-Anisic Acid	0.5937 pounds 0.0593 pounds 0.0593 pounds
Milestone	Aminopyralid	0.2752 pounds
Vastlan	Triclopyr	0.1716 pounds
Escort	Metsulfuron methyl	0.4389 pounds

BROADLEAF WEED CONTROL IN TURF

Targeted species: Broadleaf annual and perennial weeds

Purpose: To control weed populations on playing surfaces of designated playing fields and fenced field spaces, to improve health of turf and user experiences.

Locations:

Bowman, Brittingham, Cardinal Glenn, Country Grove, Elver, Garner, High Point, Junction Ridge, Kennedy, Leopold, Maple Prairie, Marlborough, Northstar, Olin, Raywood, Reindahl, Sauk Creek, Thut, Walnut Grove

Pesticides Applied For Broadleaf Weed Control in Turf:

Products Used	Active Ingredient (A.I.)	Total Amount of A.I. Used
Tru Power 3	2,4-Dichlorophenoxyacetic Acid	9.5488 pounds
	Mecoprop-p Acid	2.3872 pounds
	Dicamba acid	1.1936 pounds
Horse Power	2-Methyl-4-Chlorophenoxyacetic Acid	124.9725 pounds
	3,5,6-Trichloro-2-Pyridinyloxyacetic Acid	12.4972 pounds
		12.4972 pounds

EXOTIC PLANT (woody & herbaceous) CONTROL APPLICATIONS BY VOLUNTEERS IN PARKS

Targeted Species:

Bird’s-foot trefoil, Canada thistle, Japanese knotweed, buckthorn, crown vetch, honeysuckle, Japanese barberry, and reed canary grass.

Purpose:

To control aggressive exotic plant species while populations are small. They threaten native plant diversity if left unmanaged.

Locations:

Quarry, Hoyt, 1000 Oaks, Apple Ridge, Blackhawk, Country Grove, Cross Country Road Prairie, Eagle Trace, Elver, Flagstone, Garner, Glacier Crossing, Glenway Golf Woods, Haen, High Point, Huegel, Ice Age Ridge, Junction Ridge, Manchester, Maple Prairie, Odana Woods and Golf, Raymond Ridge, Sauk Creek, Stricker’s Pond, Valley Ridge, Walnut Grove, Wexford, Woodland Hills

Pesticides Applied by Volunteers For Control of Exotic Plant Species:

Products Used	Active Ingredient (a.i.)	Total Amount of A.I. Used
Milestone	aminopyralid	0.5480 pounds
CropSmart	glyphosate	1.7504 pounds
2,4-D	2,4-D Amine 4	1.5211 pounds
Pathfinder II Garlon 3	triclopyr	5.7409 pounds
Intensity	clethodim	0.1762 pounds

Adopt-A-Park Tree Program

The Parks Division allows interested parties to contract with pre-qualified contractors to inject approved trees with insecticide. This is intended to protect the ash trees against the Emerald Ash Borer, and the application must be repeated every 2-3 years as long as the insect remains a concern (likely for the remaining life of the tree).

Targeted species: Emerald Ash Borer

Purpose: To control insect populations in Ash trees and help prolong the life of trees by preventing harmful infestation.

Locations: BB Clarke, Yahara River, Bordner, Brittingham & Law, Heritage Heights, Hoyt, Indian Hills & Spring Harbor, James Madison, Merrill springs, Midland, Norman Clayton, Sunridge, Greentree, Rennebohm, Reynolds, South and West Shore, Spring Harbor Beach, Stevens St., Tenney, Westchester Garden, Wingra, Wirth Ct., Yahara Place Park

Pesticides Applied to Park Trees:

Products Used	Active Ingredient (A.I.)	Total Amount of A.I. Used
Tree-age Mectinite Arbor Mectin	Emamectin Benzoate	2.3702 pounds

Non-Chemical Means of Pest Control

Numerous hours were spent by staff and volunteers' hand-weeding in general park areas. In addition, staff controlled weeds by mowing and string trimming. Other methods used to improve the quality of turf grass and allow it to out-compete weeds and withstand heavy traffic included core aeration, over-seeding, fertilizing, as well as returning mulched leaves and clippings to the turf. Mulch was used in areas to help decrease weed populations. Staff and volunteers removed seed heads from invasive species and mechanically removed woody invasive plants.

Organic Turf Pilot Program Update

The Organic Turf Pilot Program began at Olbrich softball #2 and Flagstone Park in 2021 and continued in 2022. 2022 included a more aggressive approach than that of 2021 with several applications of a liquid compost tea and a bulk compost topdressing formulated to boost soil organism activity. At the end of the season, the same type of soil tests were taken on the fields and results showed an improvement in soil organism activity from the tests taken before the program began. These improvements in the soil are small and have shown up in a healthy turf stand, but also in a healthy and growing weed population. We plan to continue working with our consultants into 2023 and building the program on these fields. We will also monitor the soil benefits and make future decisions on the continuation of the pilot program based on those results as well as budget and staff availability.



Complaints/Inquiries Received

We received a few complaint/inquiries in 2022. An individual requested information about an application made to a soccer field at High Point Park and an application made by a contractor in Tenney Park. Another individual requested information about an application made on soccer fields under contract to SC Wave at Reindahl Park. A response to their inquiries was written and no further communication was needed.

Plan for 2023

The overall land management and pesticide plan for 2023, in accordance with our approved Land Management Plan, is much the same as that of 2022. We do intend to continue increasing our efforts on natural and prairie areas as well as continuing work on athletic fields. We will do this through a combination of cultural practices and, when necessary, judicious use of herbicide, when cultural and mechanical methods are not effective or efficient. We will continue to refine the athletic field management program by combining herbicide and fertilizer applications along with proper mowing, aeration and overseeding. We will continue to work with a consultant company for our organic maintenance trial at Olbrich Softball #2 and Flagstone Park athletic area.

FOREST HILL CEMETERY

Plunkett's Pest Control was contracted in 2022 for insect and rodent control in and around the mausoleum.

Products Used	Active Ingredient (A.I.)	Total Amount of A.I. Used
Weatherblok XT (rodent)	Brodifacoum	0.00021 pounds
Advion (insect)	Indoxacarb	0.0025 pounds
Suspend Polyzone	Deltamethrin	0.0525 pounds

Non-Chemical Means of Pest Control

Forest Hill Cemetery uses a variety of cultural practices to control or manage cemetery grounds as an alternative to chemical use. These mechanical and cultural control practices include, but are not limited to, the following: regular mowing to maintain height of 3” or higher, string trimming around trees and more than 30,000 headstones, hand removal of volunteer trees, suckers and weeds between markers and in flower/shrub beds, mechanical trapping of rodents in buildings, installation of door sweeps, cleaning gutters to deter interior insect issues.

THE MALL CONCOURSE

No pesticides were used on the Mall Concourse service area in 2022.

Non-Chemical Means of Pest Control

Numerous hours were spent hand-weeding landscaped beds, and cracks in sidewalks. In addition, staff controlled weeds by mowing and string trimming. Other methods used to improve the quality of turf grass and allow it to out-compete weeds and withstand heavy traffic included core aeration, compost topdressing, over-seeding, fertilizing, as well as returning mulched leaves and clippings to the turf. Mulch was used in areas to help decrease weed populations.

Complaints

We received no complaints in 2022 for pesticide use in Mall Concourse Maintenance.

Plan for 2022

The Mall Concourse maintenance plan for 2023 is the same as that of 2022.

WARNER PARK COMMUNITY RECREATION CENTER (WPCRC)

Primary pest pressures at WPCRC are due to rodents.

Pesticides Used by Plunkett Pest Control

Products Used	Active Ingredient (A.I)	Amount Used	Purpose
Firststrike	defathialone	276 blocks	Rodent control
Weatherblok XT	Brodifacoum	180 blocks	Rodent Control

Non-Chemical Means of Pest Control

Trash is removed and facilities cleaned daily to reduce insect issues, such as ants. Trash is removed from building and stored in exterior dumpsters. Door sweeps and vents are kept in good working order to prevent pests from entering.

Complaints

We received no complaints in 2022 for pesticide use in at WPCRC.

Plan for 2020

The WPCRC maintenance plan for 2023 is the same as that of 2022.

MALLARDS STADIUM GROUNDS

The Mallards organization contracts pest control in and around the buildings on the stadium grounds as well as contracting the field turf areas.

Pest control performed by 1st American Pest Control

Products Used	Active Ingredient (A.I)	Amount Used	Purpose
Demand CS	Lambda-cyhalothrin	0.0359 pounds AI	Insecticide
Demon EC	Cypermethrin	1.1718 pounds AI	Insecticide
Suspend	Deltamethrin	0.0747 pounds AI	Insecticide
Tempo WP20	Cyfluthrin	0.0351 pounds AI	Insecticide
Temprid	Imidacloprid	0.0285 pounds AI	Insecticide
Weatherblok XT	Brodifacoum	438 blocks	Rodent Control

Turf areas performed by Maple Leaf – no pesticides used in 2022.

CONSERVATION PARKS (2022)

WOODY PLANT CONTROL APPLICATIONS BY STAFF

Targeted Species: Amur maple, buckthorn, honeysuckle, Norway maple, privet, Asiatic bittersweet, porcelain-berry, multi-flora rose. Certain black locust and walnut were also targeted as part of oak woodland restoration efforts.

Purpose: The purpose of herbicide applications is to reduce the presence of these species in conservation parks in order to preserve the native diversity of plants and animals. Controlling woody vines is becoming an increasing point of emphasis as these species are spreading rapidly. Trail improvement projects also require herbicide to prevent re-sprouting.

Locations: Cut-stump, spot foliar, and basal bark applications were made at Cherokee Marsh (North Unit and South Unit), Elvehjem Sanctuary, Heritage Sanctuary, Owen, Prairie Ridge, Sandburg Woods, and Turville Point conservation parks.

Pesticides Applied by Staff for Control of Woody Species

Products Used	Active Ingredient (a.i.)	Total Amount of A.I. Used
Bush Whacker	triclopyr	0.03 Pounds
Crossbow	2-4,D triclopyr ester	1.90 Pounds 0.94 Pounds
Pathfinder II	triclopyr ester	19.49 Pounds

HERBACEOUS PLANT CONTROL APPLICATIONS BY STAFF

Targeted Species: Burdock, crown vetch, dame's rocket, garlic mustard, pampas grass, tansy, motherwort, Japanese knotweed, Japanese hedge parsley, and Lamium.

Purpose: To control aggressive exotic plant species while populations are small. They threaten native plant diversity if left unmanaged.

Locations: Cherokee Marsh (North Unit and South Unit), Heritage Prairie, Heritage Sanctuary, and Turville Point conservation parks

Pesticides Applied by Staff for Control of Exotic Herbaceous Plants:

Products Used	Active Ingredient (A.I.)	Total Amount of A.I. Used
Crossbow	2,4-D	1.44 pounds
	triclopyr ester	0.72 pounds
Makaze	glyphosate	0.23 pounds

WOODY AND HERBACEOUS PLANT CONTROL APPLICATIONS BY VOLUNTEERS

Targeted Species: Buckthorn, burning bush, honeysuckle, Japanese barberry, Phragmites, porcelain-berry, and sumac.

Purpose: To control aggressive exotic plant species while populations are small. They threaten native plant diversity if left unmanaged.

Locations: Cherokee Marsh South Unit, Meadow Ridge, Owen, and Prairie Ridge conservation parks.

Pesticides Applied by Volunteers for Control of Exotic Plant Species:

Products Used	Active Ingredient (a.i.)	Total Amount of A.I. Used
Garlon 4	triclopyr	3.10 pounds
Pathfinder II		
RoundUp Custom	glyphosate	0.49 pounds

HERBICIDE APPLICATIONS BY CONTRACTORS

Parks uses contractors to help implement approved habitat management plans, and expand restoration and management of important pollinator habitat in natural areas. As additional acres are brought under management and restored, invasive species are controlled as quickly and effectively as possible, in order to allow successful recovery or re-establishment of diverse native flora. This often requires a short-term increase in herbicide use to reduce invasive species abundance to levels that can feasibly be managed with non-chemical methods such as mowing, hand-pulling and burning.

Successful, long-term, integrated pest management will result in an overall reduction in the amount of pesticides used per acre. As pests are managed across more acres, the total use may increase, but the rate per acre will ultimately decrease.

Major initiatives in 2022 included large contracted restoration projects across 53 acres at Cherokee Marsh South Unit, Knollwood, Owen, and Sandburg Woods. Contractors also supported smaller-scale applications in accordance with IPM goals.

Targeted Species:

Woody species include autumn olive, bittersweet nightshade, black locust, buckthorn, mulberry, honeysuckle, Japanese barberry, multiflora rose, Siberian elm, sumac, Asian bittersweet, and porcelain berry. Fire intolerant native species were also targeted as part of canopy thinning efforts for oak woodland restoration at Owen and Knollwood.

Herbaceous species targeted include bird’s-foot trefoil, burdock, cattail, crown vetch, dame’s rocket, daylily, garlic mustard, Himalayan pokeweed, Japanese hedge parsley, motherwort, reed canary grass, and non-native thistles.

Purpose:

To control aggressive exotic plant species while populations are small. They threaten native plant diversity if left unmanaged.

Locations:

Cherokee Marsh (North Unit, South Unit, and Mendota Unit), Edna Taylor, Knollwood, Moraine Woods, Owen, Prairie Ridge, Sandburg Woods, and Stricker’s Pond conservation parks.

Pesticides Applied by Contractors:

Product(s) Used	Active Ingredient (A.I.)	Total Amount of A.I. Used
Clash	dicamba	1.87 pounds
Escort	metsulfuron methyl	0.19 pounds
Element 4 Garlon 4	triclopyr ester	31.47 pounds
Intensity	clethodim	6.21 pounds
Milestone	aminopyralid	0.46 pounds
Rodeo RoundUp Custom	glyphosate	10.80 pounds
Vastlan	triclopyr choline	62.55 pounds

NON-CHEMICAL PEST CONTROL MEASURES SELECTED AS PART OF IPM PROGRAM

The level of effort devoted to mechanical weed control methods continued to increase in 2022.

Hand-pulling, digging:

Staff spent approximately 100 hours this spring hand pulling garlic mustard, dames rocket, and motherwort at Cherokee Marsh, Edna Taylor, Heritage Sanctuary, Kettle Pond, Owen, and Prairie Ridge Conservation Parks.

The Friends of Cherokee Marsh, Friends of Edna Taylor, Friends of Owen, and other volunteers spent **more than 360 hours** hand-pulling garlic mustard, dame's rocket, Japanese hedge parsley, and sweet clover, and digging burdock and wild parsnip at Cherokee Marsh, Edna Taylor, Meadow Ridge, Owen, and Stricker's Pond. An undetermined (un-recorded) number of hours were also spent by volunteers pulling garlic mustard at Acewood Pond, Kettle Pond, and Sandburg Woods, where casual efforts were encouraged by posting of designated weed compost/collection sites for target plants pulled in these parks.

Prescribed Fire:

Fire is an integral component of the ecology of the Midwest. Regular burning is necessary to maintain the structure and species composition of native plant communities such as oak woodlands, tallgrass prairies, and sedge meadows. Properly timed prescribed burns can help suppress non-native and invasive species (e.g., late spring burns harm cool season weeds such as garlic mustard seedlings, but promote native warm season plants). Fire can also cause mortality to small diameter woody species like buckthorn and honeysuckle. While the number of days suitable for burning is limited by both weather conditions and staffing levels, Parks continues to expand its prescribed fire program by training and supporting volunteers, hiring contractors, and increasing intra-departmental cooperation. A total of **252 acres were burned in parklands in 2022**. This includes 240 acres within designated conservation parks, as well as 12 acres across ten sites that included managed meadows and other native plantings.

Prescribed grazing:

Goats were used to graze **59 acres** at Acewood, Cherokee Marsh, Edna Taylor, Knollwood, Owen, Prairie Ridge, and Turville Point in 2022 to control woody invasive species and brambles.

Mowing:

Considerable time (**approximately 100 hours**) was spent spot-mowing crown vetch, Japanese hedge parsley, sweet clover, and wild parsnip, as well as invasive brush. Mowing was used at Cherokee Marsh, Edna Taylor, Elvehjem, Heritage Prairie, Owen, Prairie Ridge, and Turville Point.

PLAN FOR 2023

Conservation's IPM Program will be implemented in 2023 similarly to how it was in 2022 in accordance to the Parks Division's Land Management Plan. Staff will continue to target priority invasive species, striving for complete control, in priority management units. These efforts will be complemented by volunteer-led efforts in adjacent management units. Visual estimates of canopy cover will be used to prioritize areas for brush mowing, and to determine thresholds for hand-pulling versus mowing versus foliar herbicide applications, for those invasive species that can be effectively controlled with mechanical methods only. Chemical control will be used in conjunction with mechanical methods wherever possible, in order to reduce the amount of pesticide required.

Large-scale restoration efforts will continue at Cherokee Marsh, Kettle Pond, Knollwood, Moraine Woods, Owen, Sandburg Woods, Stricker's Pond, and Turville Point. Contractors will be hired to make cut-stump and basal bark applications to buckthorn, honeysuckle, porcelain-berry and Asian bittersweet, as well as foliar applications to bird's-foot trefoil, burdock, crown vetch, daylily, garlic mustard, dame's rocket, Himalayan pokeweed, and reed canary grass. Some areas will be forestry mowed, and woody re-sprouts sprayed early in the growing season while they are still small.

Following invasive species control efforts, native grasses, forbs, shrubs, and trees will be seeded or planted to complement recovery from the natural seed bank as part of the restoration process.

Prescribed fire, prescribed grazing, mowing, and hand-pulling will continue to be used as management tools in 2023.

Complaints/Inquiries Received

Conservation received one complaint by voicemail on 6/27/2022 from Patty Lowry, advising us that she encountered people on an ATV spraying at Cherokee Marsh the day before. She did not see any signs posted, and when she approached the crew spraying, she claimed they were rude to her. The crew was working for Cardno, who Parks had contracted to spray reed canary grass at the North Unit of Cherokee Marsh. She did not indicate in the voicemail that she was opposed to the spraying itself, but rather dissatisfaction with the communication.

Conservation will advise contractors to post signs when they begin an application rather than upon completion. The area treated was very large, and it is possible Ms. Lowry simply did not encounter a sign when approaching the crew. She did not indicate her path through the park. Signs are usually posted at trailheads and junctions.

GOLF ENTERPRISE PROGRAM (GEP)

The Madison Parks' Golf Enterprise Program (GEP) consists of 72 golf holes at four facilities (Yahara Hills, Odana Hills, Monona, Glenway golf courses) encompassing approximately 750 acres of city owned property. GEP's Integrated Pest Management (IPM) philosophy is a multi-faceted approach that integrates all beneficial measures into a comprehensive program that controls pests in golf settings. Through the implementation of comprehensive Integrated Pest Management strategies that include establishing pest thresholds, monitoring for pests, cultural practices (mowing, rolling, irrigation, fertilization) and judicious use of pesticides the Golf Enterprise Program balances the expectations of our customers/golfers and manages our sites and golf courses in an environmentally sustainable and responsibly manner.

Turf Insect Management in GEP

The 2022 golf season saw little in the way of major insect problems at our facilities. Some white grub damage, primarily resulting from secondary damage caused by animals (skunks, raccoons, cranes etc.) feeding on these grubs is being reported on areas of rough and near teeing areas that currently we do not treat with insecticides. Should damage continue to increase in these non-treated areas it may necessitate making preventative insecticide applications to rough areas. Additional future insecticide treatments will follow best management practices for protecting pollinators in turf settings. Recently published guidelines are available;

(<http://ncipmc.org/action/bmpturf.pdf>) and will be implemented in our pest management programs.

Pesticides Used for Control of Insect Pests

Product(s)	Active Ingredient	Total A.I. Used	Areas Treated
Merit Lesco fertilizer with Merit Prokoz Zenith 75 WSP, 2F Syngenta Acelepryn	Imidicloprid	46 pounds	tees, fairways, rough
Aloft	Chlorantraniliprole	3.44 pounds	greens, tees
Arena, Aloft	Bifenthrin	0.473 pounds	greens
	Clothianidin	1.92 pounds	greens, tees
Bayer Tetrino	Tetraniliprole	1.224 pounds	tees (Yahara)

Turf Disease Management

The 2022 golf season was moderately challenging in terms of disease management. Turf diseases such as Pithium Blight, which have been more commonly observed in recent years, were absent this season. However, a diagnosis of Pithium Root Rot was made at Glenway, which necessitated treatments by the same chemistries used for foliar blight. More moderate weather patterns and less heavy rainfalls resulted in less disease pressure in certain areas that are prone to flooding, but drought conditions in other areas caused increased disease pressure (Anthracnose) in those areas. While a large proportion of our disease management relates to dollar spot and preventing the snow molds; increasing incidence of anthracnose on *Poa annua* is becoming problematic. We are collaborating with the University of Wisconsin and offering them fairway turf for them to study control products/strategies for this particular disease and will continue to work with the University in this regard. Some of the diseases spotted this season were pithium root rot, brown patch, dollar spot, anthracnose (both foliar and basal rot), necrotic ring spot and fairy ring.

Fungicides Used for Control of Turfgrass Disease

Products	Active Ingredient (A.I.)	Total A.I. Used	Areas Treated
Daconil Ultrex, Lesco Manicure Ultrex Bayer Chipco 26019, Lesco 18-Plus	Chlorothalonil	728.06 pounds	greens, tees, fairways
	Iprodione	539.93 pounds	greens, tees, fairways
Torque Fungicide, Omni Tebuconazole 3.6 Foliar Fungicide, Albaugh Tebuconazole 3.6F T&O	Tebuconazole	157.84 pounds	greens, tees, fairways
Banner Maxx II Fungicide, Lesco Spectator Ultra 1.3 Fungicide, Albaugh Agri Star Propi-Star EC	Propiconazole	75.565 pounds	greens, tees, fairways and trees in rough

BASF Insignia, Lexicon brand fungicides	Pyraclostrobin	16.08 pounds	greens
Dithane	Mancozeb	28.13 pounds	greens (Glenway)
Quali-Pro Mefenoxam 2AQ	Mefenoxam	3.06 pounds	greens (Glenway)
Armor Tech Rotator	Fluazinam	74.991 pounds	greens, tees, fairways
Atticus Detour 4 SC			
Syngenta Secure			
Syngenta Posterity Fungicide	Pydiflumetofen	5.48 pounds	greens, tees
BASF Xzemplar, Lexicon brand fungicides	Fluxapyroxad	14.714 pounds	greens, tees
Maxtima	Mefentrifluconizole	2.54 pounds	greens (Glenway)
PCNB- Discontinued use			
Thiram- Discontinued use			
Segway	Cyazofamid	4.68	greens (Glenway)

Plant Growth Regulation

Ethephon, trinexapac-ethyl, and prohexadione-calcium are plant growth regulators that slow the growth of turfgrass and are used to suppress seed head formation on *Poa annua*. They are being further implemented into our IPM programs. They are useful for their plant health attributes, as well as for reducing frequency of mowing required. Reducing mowing saves the city money in fuel, labor and equipment wear and tear, and reduces Golf's carbon footprint.

Chemicals Used to Regulate Plant Growth

Product(s)	Active Ingredient	Total A.I. Used	Areas Treated
Bayer Proxy, Helena Oskie	Ethephon	135 pounds	greens
Syngenta Primo Maxx, Quali-Pro T-Nex	Trinexapac-ethyl	29.024 pounds	greens, tees, fairways
Nufarm Anuew, Rightline Prohex	Prohexadione-calcium	3.3 pounds	greens

Turf Weed Management

As a general rule, highly maintained turf grass stands such as found in a golf setting require significantly less herbicide use compared to non-irrigated, non-fertilized turf areas. A healthy actively growing turf competes with and can exclude many lawn weeds, and the Golf Division's reliance on and application of turf herbicides is fairly limited in scope. A labor shortage reduced the number of applications to landscape areas, tree circles, bunker edges etc., and therefore there was a significant reduction in glyphosate use in 2022. This temporary labor shortage is not expected to continue, and we anticipate glyphosate use in 2023 to be similar to that in 2021 and prior years.

Herbicides Used to Control Turf Weeds

Product(s)	Active Ingredient	Total A.I. Used	Areas Treated
Bayer/Monsanto Roundup Lesco Ranger Pro	Glyphosate	3.76 pounds	Tree circles within rough and bunkers
Lesco 3-Way Gordons Trimec Classic Helena Vision Herbicide	Dicamba	11.96 pounds	fairways, roughs
Dimension Lesco Fertilizer with Dimension Quicksilver Lesco 3-Way, Quali-pro 3-D	Dithiopyr Carfentrazone-Ethyl 2-4D	35.85 pounds 1.663 pounds 28.8	tees, fairways, rough greens rough, fairways
Lesco 3-Way, Quali-pro 3-D Element, Native Clean	MCPPP Triclopyr	4.54 0.18	rough, fairways Invasives, other areas

Non-Chemical Means of Pest Control

Golf relies heavily on cultural practices to manage the turf stand. These cultural practices include mowing, vertical mowing, watering, fertilizing, aerification, topdressing and rolling. Regular mowing controls many annual weed species and regular mowing promotes the rhizomatous and stoloniferous growth habitat of most turf species that crowds out many weed species. Additionally, the height of cut of the turf can affect the presence and population of many weeds and pests. As a general rule; higher heights of cut promote healthier turf stands. A rough grass stand mowed at 3 inches of cut will have far less crabgrass populations than a turf cut at 1.5 inches. Furthermore, a putting green cut at 5/32 of an inch will have much less disease, algae and moss infestations than a green cut at 1/8 of an inch or less. Staff carefully monitors moisture levels and irrigates to ensure the turf is not drought stressed. A semi-regular fertilization program is utilized to promote a healthy lawn. Regular aerification promotes a healthy water-soil-air mix that allows the turf to grow vigorously and withstand traffic and pests. Topdressing with sand provides smooth putting surfaces, increases drainage and dilutes organic matter, which allows the turf to withstand traffic and pest damage, such as anthracnose. Rolling helps smooth the playing surface, reduces mowing frequency, and has been shown to directly reduce the severity and incidence of the common turf grass disease dollar spot.

Complaints

The Golf Enterprise did not receive any complaints in 2022 related to pesticide usage.

Plan for 2023

The Integrated Pest Management plan and pesticide use for 2023 is expected to be similar to that of previous years, with a slight increase from 2022 possible as weed and disease concerns going forward have to be addressed more proactively to prevent turf loss and customer satisfaction. As always pesticide use in the Golf Enterprise will be highly dependent on budgetary constraints and managing the expectations of customers, which seasonally evolve due to unforeseen factors such as weather-related changes in the amount of play and traffic.

Olbrich Botanical Gardens

Pest Control in Olbrich Botanical Garden's Facilities

Rodent and Insect control is conducted throughout and around the facility (including the Bolz Conservatory and Production Greenhouses). Rodent/Insect control is practiced only in areas where there is a known problem. The material is contained in bait stations which are concealed and tamper proof and are not accessible to the public. Orkin Pest Control, a commercial pest control company, routinely checks and services the stations around the property.

Product Used	Active Ingredient (A.I)	Total A.I. Used	Purpose
Final All-Weather Blox EPA# 12455-89	Brodifacoum 0.005%	150 ounces	Rodent control
Confrac with Lumitrack EPA# 12455-133	Bromadiolone 0.005%	36 ounces	Rodent control
Phantom Termiticide EPA# 241-392	Chlorofenapyr 21.45%	21 ounces	Insect control
Suspend Polyzone EPA# 432-1514	Deltamethrin 4.75%	3 ounces	Insect control
Patrol EPA# 100-1066	Lamda-Cyhalothrin 9.7%	7 ounces	Insect control
Alpine WSG EPA# 499-561	Dinotefuran 40%	16 ounces	Insect Control
Scion Insecticide EPA# 279-3612	Gamma-cyhalothrin 5.9%	6 ounces	Insect Control

Complaints Received

There were no visitor complaints regarding rodent/insect control in Olbrich's Facilities in 2022.

Pest Control in the Eugenie Mayer Bolz Conservatory

Since the Bolz Conservatory opened to the public in November of 1991, the insect control program has strived to use the least toxic methods of insect and pest control. No chemical pesticides are used on the plant collection within the Conservatory. Our Integrated Pest Management strategy within the Conservatory relies primarily on biological, mechanical, and removal as means of controlling insect pests. Orkin (pest control company) maintains several boxed traps discreetly placed throughout the premises to aid in insect and rodent control (These numbers are provided in the Facilities Reporting section above). Among the myriad of biological controls we use, beneficial insects are routinely released to target plant-damaging insects. Some of the beneficial insects used in the conservatory have a broad diet of target insects while others control a single insect. Following is a list of the beneficial insects that are released into the conservatory as the situation warrants.

Beneficial Insect	Target Pest
Amblyseius cucumeris (predator)	Thrips, Mites
Aphidius colmani	Aphids
Phytoseiulus persimilis	mites

Chrysoperla spp. (predator)	Several Insects
Cryptolaemus montrouzieri (predator)	Mealybugs, Scales, Aphids
Encarsia formosa (parasite)	Whitefly
Delphastis pusillus	Whitefly
Orius spp. (predator)	Thrips, Aphids, Mites

Birds, specifically Quail (*Coturnix coturnix*), have been effective at controlling the nuisance palmetto bugs found in the conservatory. Assorted frogs and toads living in the conservatory also use the palmetto bugs as a food source. Populations of these animals are maintained as part of the pest control program.

Vigorous daily or weekly washing of the plants in the conservatory has also proven to be very effective at controlling unwanted insects. This practice will continue as part of the pest control program.

The conservatory insect control program will continue to evolve as new beneficial insect species and additional control methods are carefully trialed. It is obvious from past success that it is possible to maintain a healthy plant collection while relying on least toxic and non-traditional methods of insect control.

Pesticides Used to Control Pests in Production Greenhouses

Product Used	Active Ingredient (A.I)	Total amt. of A.I. applied	Purpose
Aria	50.0% Flonicamid	0.05247 lbs	Noenicotinoid Replacement Insecticide
Azagaurd	3.0 % Azadirachtin	0.007218 lbs	Insect Growth Regulator - Insecticide /Nematicide
Botanigard 22 WP	22% Beauveria bassiana strain GHA	0.351054 lbs	Biological insecticide
Botanigard ES	11.3% <i>Beauveria bassiana</i> Strain GHA	0.1199043 lbs	Biological insecticide
Cease	1.34% QST 713 Strain of <i>Bacillus subtilis</i>	0.221502 lbs	Biological Fungicide
Compass 0 50WDG	50.0 % Trifloxystrobin	0.0006613 lbs	Fungicide
Conserve SC	11.6% spinosad (including Spinosyn A and Spinosyn D	0.0412264 lbs	Insect Control
Decathalon WP	20.0% Cyfluthrin	0.0238451 lbs	Insect Control
Distance IGR	11.23% *Pyriproxyfen	0.0396531 lbs	Insect Growth Regulator

Enstar AQ	18.4% S-Kinoprene (2-propynyl-(2E,4E,7S)-3,7,11-trimethyl-2-4-dodecadienoate	0.0419888 lbs	Insect Growth Regulator
Flagship 25WG	25.0% Thiamethoxam	0.0347227 lbs	Granular Insecticide
Kopa Insecticidal Soap	47% Potassium Salts of Fatty Acids	7.00206 lbs	Insecticide, Miticide, Fungicide
Marathon 1% granular	1.0% Imadacloprid	0.0031305 lbs	Systemic Insect control
Mavrik Aquaflo	22.3% Tau-fluvalinate	0.0285886 lbs	Insecticide/Miticide
Merit 75 WP	75% Imidacloprid	0.00975 lbs	Systemic Insect control
Molt-X	3.0% Azadirachtin	0.016626 lbs	Botanically based Insectice (IGR)
No Fly WP	18.0% Isaria fumosorosea strain FE 9901	0.018774 lbs	Biological insecticide
RootShield Granules	1.15% <i>Trichoderma harzianum</i> strain T-22	0.00539 lbs	Biological Fungicide
Rootshield Plus WP	1.15% <i>Trichoderma harzianum</i> Rifai strain T-22 0.61% <i>Trichoderma virens</i> strain G-41	0.0064675 lbs	Biological Fungicide
Safari 20 SG	20.0% Dinotefuran	0.2086454 lbs	Systemic Insect control
Suffoil - X	80% Mineral Oil	14.96848 lbs	Spray oil emulsion fungicide, insecticide, and miticide.
Talstar P	7.9% Bifenthrin	0.0190153 lbs	Insect Control
Thuricide BT	98.35% <i>Bacillus thuringiensis</i> Subsp. <i>Kurstaki</i> strain SA-12 solids, spores and lepidopteran active toxins	0.03206 lbs	Biological insecticide
Tristar 8.5SL	8.5% acetamiprid	0.016456 lbs	Systemic Insect control
Zerotol 2.0	27.1% Hydrogen Peroxide 2.0% Peroxyacetic Acid	1.4419 lbs	Fungicide, Bactericide, and Algacide for pest prevention and suppression

PEST CONTROL IN OUTDOOR GARDENS

Olbrich Botanical Gardens is committed to gardening for the environment, as well as our visitors that expect to see gardens maintained at a high aesthetic standard. In addition, horticulturists continue to face new disease and insect attacks, some of which may be tied to our changing climate. As always, the principles of Integrated Pest Management (IPM) are applied to gardening practices

Pesticides Used to Control Pests in Outdoor Gardens:

Product Used	Active Ingredient	Total A.I. Used	Purpose
Arbotect 20-S EPA #100-892	Thiabendazole Hypophosphite	1.404 lb	Tree Health
Bt EPA #4-226	<i>Bacillus thuringiensis</i> (subspecies <i>kurstaki</i> strain)	0.026 lb	Insect control
Cambistat EPA # 7447-3	Paclobutrazol	0.108 lb	Tree Health
Conserve EPA #62719-291	Spinosad	0.0001 lb	Insect Control
Decathlon EPA #59807-17	Cyfluthrin	0.093 lb	Insect control
Distance EPA 359639-96	Pyriproxyfen	0.0018 lb	Insect Control
Emamectin Benzoate EPA #100-1309	Emamectin Benzoate	0.07 lb	Tree Health
Glyphosate Pro EPA #72112-4	Glyphosate	2.69 lb	Weed control
K-Tea EPA #67690-24	Copper trimethylamine	0.10 lb	Algae control
Marathon 1% EPA #59807-15	Imidacloprid	0.005 lb	Insect Control
M-Pede EPA3 #10163-324	potassium salts of fatty acids	0.0158 lb	Insect control
Ranger Pro EPA #524-517	Glyphosate	0.84 lb	Weed Control
Reward EPA #100-1091	Diquat dibromide	0.035 lb	Weed Control
RoundUp Quik Pro EPA #524-535	Glyphosate Diquat dibromide	1.5 lb 0.058 lb	Weed Control
Safari EPA # 86203-11-59639	Dinotefuran	0.074 lb	Insect Control
Sethoxydim E-Pro EPA #79676-4	Sethoxydim	0.005 lb	Weed Control
Speed Zone EPA #2217-864	2, 4D Mecoprop-p acid Dicamba acid Carfentrazone-ethyl	0.018 lb 0.0037 lb 0.0011 lb 0.0004 lb	Weed Control
Suffoil-X EPA # 48813-1-68539	Mineral oil	0.2 pounds	Insect control

Tordon RTU EPA # 62719-17	Picloram 2,4-dichlorophenoxyacetic acid	0.0049 pounds 0.0191 pounds	Weed control
VoleX	Corn Gluten meal Sesame Sodium Chloride Citric Acid	1.1 lb 0.45 lb 0.15 lb 0.1lb	Rodent control
Xytect EPA #74479-RG	Imidacloprid	0.066 lb	Tree Health

Non Chemical Measures Taken in Outdoor Gardens

Continuing a program that began in the 2011 season, a contractor was engaged that specializes in applications of compost tea, a product that inoculates the soil with a multitude of beneficial microorganisms. This leads to healthier soils and more resilient plants, minimizing the need for synthetic fertilizers and pesticides. Multiple areas were given season long applications last year. These locations continue to be monitored for long term results.

In 2022, Olbrich continued its efforts to keep chemical pesticide use in the outdoor gardens as low as possible. This can be challenging, given the high aesthetic standards expected at a highly regarded botanical garden. Horticulturists continue to face new disease and insect attacks, some of which may be tied to our changing climate.

Olbrich's Garden Scouts are a volunteer team who emphasize our commitment to sustainable gardening, our discontinuation of chemical use, as well as support experimentation with natural alternatives and the creation of insect-inspired elements throughout the gardens. These volunteers help staff scout for beneficial insects, pollinators and pests from May-October. They've participated in educational lectures, helped fill native bee houses, tagged Monarch butterflies, and planted bulbs for early spring pollinators. We look forward to continuing this team in 2023. WI DNR Plant Pest and Disease Specialist Andrea Diss-Torrance participated in a pilot moth-scouting event in the outdoor gardens.

As always, the principles of Integrated Pest Management (IPM) are applied to gardening practices. IPM stresses evaluating a wide range of criteria to decide when and what treatments are necessary for dealing with garden pests; and, selecting solutions that minimize the amount and types of products used to combat them. Below is a listing of some of the strategies that fall under the guidelines of Olbrich Botanical Garden's IPM program.

Select disease and pest resistant varieties.

One good example is the collection of ornamental crab apples, prone to fungal diseases, which was eliminated from the gardens reducing the need for fungicide use.

Assess damage thresholds.

Staff are willing to tolerate some damage, both aesthetic and pathological. For instance, minor cases of powdery mildew on ornamental plants, while easily cured by common fungicides, are usually ignored. The same holds true for many of the minor insect

problems that are present. Pesticides are applied only if the health of the plant is compromised or the visual attraction of the plant is greatly affected. Turf weeds are tolerated within the aesthetic standards of the Garden. Less toxic solutions are utilized before selecting a more toxic product. Minor localized problems may be pruned out rather than treating the entire plant with a chemical, for instance a single branch on a fruit tree with tent caterpillars. Olbrich does treat selected valuable specimen trees, and two ash trees were treated against Emerald Ash Borer in 2021.

Manual/cultural controls.

The great majority of weed control in the gardens is accomplished by manual pulling and preventing them in the first place by liberal and frequent applications of leaf and wood mulches. Vulnerable new plantings around the Learning Center and elsewhere were equipped from the start with wire cages to prevent rabbit and vole damage.

Let nature help.

When gardens are healthy, there is a natural balance between predator and prey that helps keep plant collections and gardens protected from visible damage. When the gardens function as an ecosystem, there are natural checks and balances that minimize the amount of chemical inputs required. Birds and beneficial insects help keep pest insects in check and resident foxes, red-tail hawks and mink have helped reduce rodent and rabbit problems. Rabbits are live trapped and relocated when their population reaches damaging levels. A cyclical increase in the population causes an increase in efforts in this area, which continues into the winter. Once again 2022 saw a noticeable increase in raptor presence, as well as in fox and coyote presence. The outdoor gardens participate in monitoring through the UW-Urban Canid Project.

Complaints Received:

There were no visitor complaints regarding chemical use in the gardens in 2022.

Pesticide Management Plan for the 2023 Season

The garden staff will continue to work with an Integrated Pest Management (IPM) program. Staff will monitor the Garden's indoor and outdoor plant collections for optimum health and vigor, strive to improve the cultural and biological environment, provide mechanical eradication if possible, use resistant plant varieties, eliminate the plant if the problem persists and, as a final option, use pesticides to control plant pests. This past year saw a continuation of the use of beneficial insects in the Bolz Conservatory with satisfactory results. Canopy birds and ground quail also assist in keeping pest populations low in the Bolz Conservatory. The outdoor garden staff will continue to seek out less toxic pesticides that will provide control of pests while providing a safe environment for visitors. Staff will continue to experiment with alternatives to the use of traditional pesticides, including the use of beneficial insects in the greenhouse.