

**City of Saint Paul Division of Parks and Recreation
2008 Integrated Pest Management Program**

Parks and Recreation Areas: The Integrated Pest Management Program (IPM) for the Division of Parks and Recreation consists of four types of applied control:

1. Host Plant Resistance: Whenever possible, the Division uses plant species, sub-species and cultivated varieties appropriate for the environment in which they are to be established. These plants are adapted to the local climatic conditions and can withstand many of the common diseases and pests in the area. Plant material bred with genetic resistance to local pest and disease pressures would be included.

2. Cultural Control: Proven, best-practices cultural control is one of the most widely used and adaptable to all parts of the Division. The following methods are used with this type of control:

- Maintaining healthy plants with optimum nutrient and moisture levels
- Using correct pruning and cutting practices
- Avoiding monocultures
- Correct use of mulch to retain moisture and suppress weed growth
- Following recommended mowing cycles and turf height

3. Chemical Control: The Division uses pesticides when the aesthetic or, in certain cases the physiological injury to a plant is more than can be tolerated within a particular location. The aesthetic injury threshold varies from one location to another. For example, general park areas can withstand greater aesthetic injury than a golf course. The Division uses pesticides that target specific problems, rather than a broad spectrum pesticide that can impact non-target species. Whenever possible, the least toxic concentration that is highly efficacious with a short re-entry or rapid dissipation is preferred. This reduces the amount of chemical released into the environment and helps to prevent accidental over-exposures.

4. Biological Control: Under certain environmental conditions, lab-reared natural enemies (parasitoids, predators, or pathogens like fungi or bacteria) are released and used to control the target pest species.

In 2008, the Division increased a division wide initiative to explore organic alternatives to herbicide and fertilizer use. Additional test plots will be established during 2008 to analyze the effectiveness of one or more natural lawn care products/systems. These test plots will be aggressively monitored and documented so Parks can make appropriate improvements to future practices pending the results.

Within the city there are five separate areas that use pesticides as a means for controlling unwanted pests and disease. These are: Golf courses, Parks Maintenance, Forestry, Como Park Zoo and Conservatory and the Midway Stadium. Each location has problems and procedures unique to their area, but all use chemical control in the most environmentally responsible ways possible.

Golf Courses:

Golf courses use a variety of chemicals to control diseases such as Dollar Spot and Snow Mold, to control pests such as cut worm and to add nutrients to their highly used turf areas such as fairways and tee boxes. The golf courses review their chemical usage to ensure that the chemicals they choose are the most effective and environmentally friendly ones available and phase out the ones that do not meet their standards.

Fairways:

- Grass is cut to a height determined by the desired play of the ball. For golfers to utilize the fairway, the turf must be kept in proper playing condition.
- Fairway turf is fertilized, aerated and verticut to promote the development of dense, healthy turf and to alleviate compaction.
- Fairway turf is irrigated. Frequency is determined by need.
- Broadleaf and grassy weeds are controlled by cutting and/or herbicide
- Fungal invasions are controlled by cutting, adjusting irrigation, adjusting fertilization, and/or by a fungicide.

Tees:

- Tee areas require a short mow height which results in greater stress on the tee turf. The tee turf is also stressed by gouging and foot traffic.
- Tee turf is fertilized, aerated and verticut to promote dense healthy turf and to alleviate compaction.
- Broadleaf and grassy weeds are controlled by cutting and/or herbicide
- Fungal invasions are controlled by cutting, adjusting irrigation or nutrients and/or fungicide
- Tees are aerated twice a year
- Tee turf is irrigated on a need basis

Greens:

- Greens are the most highly maintained areas on a golf course. Greens are cut to an extremely short height on a nearly daily basis to ensure that golfers are able to use the area as determined by the game.
- Green turf is fertilized, aerated, and verticut to promote dense, healthy turf and to alleviate compaction.
- Broadleaf and grassy weeds are controlled by cutting and/or herbicide
- Fungal invasions are controlled by cutting, adjusting irrigation or nutrients and/or fungicide
- Greens are mechanically aerated twice a year and water aerated three times a year.
- Green turf is irrigated on a need basis

Roughs:

- Trees and shrubs are trimmed to maintain height and view lines within the golf course

- Trees and shrubs are fertilized on a need basis
- Grass is cut to a standard height
- Broadleaf and grassy weeds are controlled by cutting and/or herbicide
- Irrigation in the rough is done in heavy play areas or in an area of new turf only on an as needed basis.

Pond Areas/Water Hazard:

- Active disease management is not done in natural ponds. Vegetation is controlled when plant populations exceed the desirable level for a game of golf or threaten the quality of the water environment.
- Algae is controlled to prevent irrigation pipes from clogging, either using natural controls, such as barley straw or herbicide.

Deep Rough/Natural Areas:

- No active disease management is done in these areas. Trees and shrubs are trimmed only to correct hazardous situations
- Non-native and/or invasive trees and shrubs are removed as time allows.

Parks Maintenance:

Due to the extensive and diverse areas within the parks and recreation areas it is hard to classify the use of pesticides to certain activities. Chemicals are used on an as-needed basis only after thoroughly exploring non-chemical options.

- Park turf areas are mowed on a cycle using a combination of large rotary mowers to small trim mowers. Turf is cut to a height (approximately 3 inches) which is acceptable to park patrons. For most parks, this cycle is once every two weeks. In some high profile parks (such as downtown) and/or athletic fields, the cycle is once per week.
- Minimal spraying is done to control weeds for purely aesthetic reasons.
- With a few exceptions, there is no spraying for dandelions in the general park system, which includes parkways, recreation centers, neighborhood parks and regional park turf areas. The exceptions include some high profile parks such as downtown and Harriet Island.
- Parks frequently incorporates mulch rings around the base of trees to prevent mower and weed whip damage when and wherever possible. Occasionally, Glyphosate is used around trees or objects when mulching is ineffective.
- Herbicide, commonly Glyphosate or Triclopyr, is sometimes used to treat stumps of cut trees or brush, especially in the case of eradicating invasive species such as buckthorn.
- Trapping or licensed exterminators are the main method of controlling rodents in park buildings

Forestry:

- Forestry uses a limited amount of chemical to control epidemic diseases or insect infestations. There is no spraying for aesthetic purposes.
- Chemical may be used to treat stumps and prevent re-sprouting if stump removal is not an option.

Como Park Zoo and Conservatory:

The Marjorie McNeely Conservatory:

The Marjorie McNeely Conservatory is an intensively cultivated botanical environment under glass. The public glasshouse IPM program differs from the production greenhouses (behind-the-scenes).

* The public areas are rarely chemically treated. Occasionally non-persistent, low toxicity pesticides such as horticultural oils and soaps are utilized to knock down significant pest populations. Proper cultural practices, timely scouting for pests and regular releases of beneficial insects are the primary control methods utilized on the permanent plant collections within the public conservatory facilities.

* Timely applications of pesticides and growth regulators in addition to sanitation and best cultural practices are important components of the IPM program in the non-public production greenhouses.

Tropical Encounters:

Tropical Encounters is an immersion exhibit of both plants and animals therefore no pesticides are used. All insect problems are addressed using cultural and biological controls to suppress pest populations and minimize plant damage. The biological controls include releases of species specific parasitoids, predators, or pathogens like fungi or bacteria.

Como Park Zoo and Conservatory Gardens including the Como Ordway Memorial Japanese Garden:

Proper plant selection and effective cultural methods are important IPM factors that minimize the need for pesticides, herbicides and fungicides. The gardens are categorized into maintenance levels.

The Japanese Garden is an intensively managed, high maintenance garden. Weed control in high maintenance areas is more intensive and may incorporate herbicides along with physical eradication. Insecticides or fungicides may be used in high maintenance areas to minimize plant damage or for the preservation of significant botanical specimens. A professional tree service company may be hired to apply fungicides to control Dothistroma Needle Blight (*Mycosphaerella pini*) on the Austrian Pines (*Pinus nigra*) which are critical landscape components in the Japanese Garden design or to apply preventive treatment against Dutch Elm disease (*Ophiostoma ulmi*) on a specimen American Elm (*Ulmus americana*) in the Como Zoo landscape.

In medium and low maintenance landscape areas, reliance on cultural techniques, species selection, and indigenous beneficial insects are sufficient to maintain the integrity of the

ornamental plants. Herbicides are used infrequently to control weeds in medium and low maintenance areas. Herbicides are also used as part of the campaign to eradicate buckthorn throughout the Como Park Zoo and Conservatory Campus.

Midway Stadium:

- Turf is mowed to maintain the playing field and control weed populations
- Turf is fertilized and irrigated to promote healthy, dense growth
- Little or no herbicide application is done outside the playing field
- Fungicide application is done on an as needed basis
- Trapping is the preferred method of rodent control rather than chemical

GOLF COURSES Fungicides: <u>BANNER GL</u> Used to control Summer Spot <u>BANNER MAXX</u> Used as a broad spectrum fungicide to control Summer Patch, Dollar Spot, Anthracnose, and Brown Patch <u>BARRICADE</u> Used to control Snow Mold <u>BAYLETON 50</u> Used to control Brown Spot, Copper Spot, Dollar Spot, Large Patch, Pink Snow Mold, Rust and other fungal invasions. <u>CHIPCO GT26</u> Used to control Brown Patch, Pythium diseases, and other winter time diseases <u>CHIPCO 26019</u> Disease Control <u>CHLOLNEB</u> Used to control Snow Mold <u>CLEARYS</u> Used to control dollar spot <u>CONCORDE DF</u> Used as a broad spectrum fungicide to control Dollar Spot, Leaf Spot, Brown Patch, etc... <u>CURALAN</u> Used to control Dollar Spot <u>POLAR KOTE</u> Used to control Snow Mold <u>TERSAN 1991</u> Disease control <u>TEREMEC SP</u> Disease Control	<u>TERRECHLOR</u> Disease control <u>DACONIL ULTREX</u> Disease control <u>TURFICIDE 400</u> Disease control <u>RUBIGAN</u> Disease control <u>DACONIL 2787</u> Disease Control <u>SUBDUE</u> Disease Control <u>ALIETTE</u> Disease Control <u>BANOL</u> Disease Control <u>PROSTAR 4 PLUS</u> Disease Control <u>SENTINEL</u> Disease Control Herbicides: <u>MILLENIUUM</u> Used to control broadleaf weeds <u>DRIVE</u> Used as a post-emergent herbicide for crabgrass and other turf grass weeds <u>ROUND UP</u> Used to control broadleaf and grassy weeds <u>TRIMEC</u> Broadleaf <u>MECOMEC (MCPP)</u> Broadleaf <u>BANVEL</u> Broadleaf <u>DACTHAL</u> per-emergent <u>CONFRONT</u>	<u>ACCLAIM</u> Crab-grass <u>DIMENSION</u> Grassy Weeds <u>GALLERY</u> Grassy Weeds Fertilizers: <u>AWARD 21 - 0 - 22</u> Used to replace lost nutrients <u>BEST 22 - 0 - 22</u> Used to replace lost nutrients <u>DIMENSION 15 - 0 - 15</u> Used to replace lost nutrients <u>MILORGANITE 6-2-0</u> <u>21-0-22</u> <u>22-0-10</u> <u>18-0-24</u> <u>22-0-10</u> <u>20-0-17</u> <u>25-0-25</u> <u>24-3-12</u> <u>21-3-16</u> <u>10-18-18</u> <u>18-3-15</u> <u>MILLENNIUM ULTRA 22 - 0 - 10</u> Used to replace lost nutrients and control broadleaf weeds <u>PAR EX 21 - 0 - 22</u> A micro-nutrient fertilizer used to help turf to withstand stress. Applied according to label directions. <u>PARTNERS 22 - 0 - 18</u> Used to replace lost nutrients <u>UMAXX 21 - 0 - 21</u> Used to replace lost nutrients	Insecticides: <u>DYLOX</u> Used to control cutworms <u>TURCAM</u> Turf Insects <u>DELTA GARD</u> <u>DURBAN</u> <u>KELTHANE</u> <u>SEVIN</u> <u>MAURIK</u> Aquatic Chemicals: <u>REWARD</u> Biological control: Barley straw
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Parks Maintenance

Herbicides: <u>TRICLOPYR:</u> Garlon 3A: Used to control woody, broadleaf vegetation mainly through foliar application or cut stump treatment Garlon 4: Used to control woody vegetation mainly through stump and basal bark application Pathfinder: Ready-to-Use triclopyr	<u>GLYPHOSATE:</u> Rodeo, Aquaneat (aquatic) RazorPro, Round Up(terrestrial) Used to control woody and herbaceous vegetation.	<u>ORGANIC PRODUCTS:</u> All-Down: Non-selective, non-systemic.	Rodent Control: Contracted to V.I.P. Pest Control
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Midway Stadium

Fungicides <u>BANOL</u> Used to control pythium diseases	Herbicides: <u>ROUND UP</u> Used to control woody and herbaceous vegetation <u>TRIMEC</u> Selective Broadleaf weed control <u>DACTHAL</u> Pre-emergent weed control <u>CONFRONT</u> Broadleaf weed control	Fertilizers: <u>ROOTS 15-3-8</u> <u>ULTIMAX 22-0-18</u> <u>POLYON 20-0-18</u>	Insecticides/rodenticides: <u>AMBUSH</u> Used to control mosquito and gnats <u>TURCAM</u> Used to control turf insects <u>POISON BAITS</u> Used to control gophers and moles
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Natural Resources (Forestry, Gardening, and Environmental Services)

Herbicides: <u>TRICLOPYR:</u> Garlon 3A: Used to control woody, broadleaf vegetation mainly through foliar application or cut stump treatment Garlon 4: Used to control woody vegetation mainly through stump and basal bark application	<u>GLYPHOSATE:</u> Rodeo, Aquaneat (aquatic) RazorPro, Round Up(terrestrial) Used to control woody and herbaceous vegetation. <u>ORGANIC PRODUCTS:</u> All-Down: Non-selective, non-systemic.	<u>CLOPYRALID:</u> Transline: Used to control vegetation from the legume family (vetch, knapweed, black locust) <u>IMAZAPIC:</u> Plateau: Selective herbaceous herbicide	Fertilizers: <u>IRON CHELATE</u> Used to treat chlorosis in <i>Quercus ellipsoidalis</i>
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Marjorie McNeely Conservatory public glasshouses and non-public production greenhouses, Como Ordway Memorial Japanese Garden and Como Park Zoo and Conservatory Gardens

<u>Growth Regulators</u> DYNA-GRO KLN <u>A-REST</u> <u>B-NINE SP</u> <u>FLOREL</u> <u>Herbicides</u> <u>SCYTHE</u> <u>ROUNDUP PRO</u> <u>PREEN</u> <u>GARLON</u> <u>RAZOR</u> <u>TRIAMINE</u> <u>Insecticides</u> (Marjorie McNeely Conservatory Rodent & Roach Control is under contract w/ Plunketts Zoo building pest control is under contract w/Plunketts.)	<u>CONSERVE SC</u> , thrip <u>ENDEAVOR</u> , aphids <u>NEEM OIL</u> , all insects <u>FLORAMITE</u> , spider mites <u>SLUGGO</u> , slugs <u>TALUS</u> , barnacle scale <u>SAFARI SG</u> , all insects Activator / Adjuvants <u>AQUA GRO L</u> <u>LATRON B-1956</u> <u>YUCCA AG</u> <u>YUCCA H</u> Insect Repellent <u>CAN=T BITE ME</u> , mosquitoes Biological Controls: <u>Aphids:</u> <i>Aphidius colemani</i> -parasitic mini-wasp	<u>Fungicides</u> <u>TERMIL</u> ., mildew on geraniums <u>SUBDUE 2E</u> , root and stem rot, rhizoctonia <u>TRIFORINE EC</u> , powdery mildew <u>PHYTON 27</u> , copper fungicide <u>MILSTOP</u> , powdery mildew Dothistroma Needle Blight in the Japanese Garden under contract w/ Rainbow Tree <u>LIME SULFUR</u> <u>SPRAY</u> , broad spectrum fungicide	<u>Sanitizers</u> <u>GREENSHIELD P</u> , algaecide, fungicide, bactericide, disinfectant <u>TRIATHLON</u> , algaecide, fungicide, bactericide, disinfectant <u>ZERO-TOL</u> , algaecide, fungicide, bactericide, disinfectant <u>PRON TECH</u> , algaecide, fungicide, bactericide, disinfectant <u>Fertilizers</u> water soluble, granular, slow-release and liquid concentrate formulations of N-P-K are used depending on the maintenance level,
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ENSTAR II, all insects TALSTAR GH, all insects INSECTICIDAL SOAP, all insects KELTHANE 35WP, mites DIAZINON 500 AG, Aphids, mites, miners, flies NICOTINE SMOKE, aphids, mealy bugs AVID .15EC, mites, leaf miners MARATHON 1% GRAN., all insects SUNSPRAY HORTICULTURAL OIL, scale, mites DIPEL, caterpillar BOTANIGARD ES, all insects CINNAMITE, spider mites MAVRIK, all insects	<i>Hippodamia convergens</i>- Ladybug Scale and Mealybug: <i>Aphytis melinus</i>- parasitic mini-wasp <i>Cryptoleamus montrouzieri</i>- predatory beetle <i>Rhyzobius (Lindoris) lophanthae</i>- black lady beetle Fungus gnats: <i>Atheta coriaria</i>-rove beetle Spider Mites: <i>Neoseiulus fallacis</i>-predatory mite <i>Phytoseiulus persimilis</i>-predatory mites Thrips: <i>Neoseiulus cucumeris</i>-predatory mites <i>Hypoaspis miles</i>-predatory mites <i>Orius insidiosus</i>-predatory true bugs White Fly: <i>Encarsia formosa</i>-parasitic mini-wasp		area and crop or plant. Potassium silicate formulations are also used
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