



Integrated Pest Management Practices

Presented for review and approval by the City of Lake Oswego Parks & Recreation IPM Committee

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Mission Statement

The mission of Lake Oswego Parks & Recreation Department is to provide excellence in building community, enriching lives, and caring for the urban and natural environment. The Lake Oswego Parks & Recreation Department endorses the principles of Integrated Pest Management (IPM). The Lake Oswego Parks & Recreation Departments IPM Program uses multi-faceted pest control strategies that are safe, cost-effective, sustainable, and minimize the negative impact on the environment and human health.

Integrated Pest Management

The Lake Oswego Parks and Recreation Department follows an Integrated Pest Management Policy adopted by the Lake Oswego Parks and Recreation Department in December 2012.

According to Oregon Statutes (ORS 262.1), Chapter 943, an IPM is defined as follows: "Integrated pest management means a coordinated decision-making and action process that uses the most appropriate pest control methods and strategies in an environmentally and economically sound manner to meet pest management objectives. The elements of integrated pest management include: (a) preventing pest problems; (b) monitoring for the presence of pests and pest damage; (c) establishing the density of pest population, which may be set at zero, that can be tolerated or corrected with a damage level sufficient to warrant treatment of the problem based on health, public safety, economic or aesthetic threshold; (d) treating pest problems to reduce populations below those levels established by damage thresholds using strategies that may include biological, cultural, mechanical and pesticidal control methods and that shall consider human health, ecological impact, feasibility and cost effectiveness; and (e) evaluating the effects and efficacy of pest treatments."

*The IPM process, first determines if a pest needs to be managed, and if so, how best to do it. Key elements are information gathering, decision making, management action, and monitoring of results. IPM uses effective, low-risk strategies and practices. Management actions include cultural, physical, mechanical, manual, biological, and pesticidal. Licensed and trained Parks Maintenance professionals often select a combination of methods (pesticide applications being the method of last resort) to manage specific pest populations on a case-by-case basis, with a goal of reducing reliance on pesticides. Methods employed conform to recognized standards established and endorsed by state and federal regulatory agencies, state educational institutions, and organizations such as the Western Integrated Pest Management Center.

Examples of IPM within the Parks & Recreation Department include:

- Mulching of planting beds to reduce establishment of weeds.
- Utilizing plants with natural resistance to pests.
- Design features to include concrete curbs, mow strips, and landscape designs.
- Release of natural biological controls to control non-natives such as plants and insects.
- Proper mowing, irrigation, and fertilization of park turf to increase vigor and reduce weed populations.
- Applications of selected herbicides to control invasive weeds before seed formation to prevent future weed infestations.
- Manual cultivation of weeds in shrub & landscape beds

- Pruning of trees and shrubs to increase air circulation and reduce susceptibility to disease and insect problems.

*Refer to page 8 “Criteria for choosing a pest control method”

Pesticide Use

Pesticide is a general term for any substance used to control pests. Pests include but are not limited to weeds, insects, diseases, disease-carrying organisms, slugs, snails and rodents. To control these pests, our personnel select the best methods available. When it is necessary to use chemical controls, The Lake Oswego Parks & Recreation Department feels it can avoid or minimize risks by careful selection and application of the control measures. When all IPM methods are exhausted within the parks system, we will then resort to using pesticides.

The Lake Oswego Parks & Recreation Department has found that pesticides have been helpful tools in ensuring a high standard of performance when used in conjunction with other control methods. The Lake Oswego Parks & Recreation Department employees are required to comply with all pesticide label directions, safety laws, and local, state, and federal pesticide regulations, and are required to be licensed as a public applicator for the State of Oregon.

Sustainable management practices attempt to eliminate waste in any program. The Lake Oswego Parks & Recreation Department employees avoid generating pesticide waste by use of several strategies. Advanced planning, purchasing the amount needed, and mixing only the precise amount needed to complete the job can usually avoid elimination of waste material. When waste material is generated, The Lake Oswego Parks & Recreation Department adheres to the Oregon Department of Environmental Quality and the U.S. Environmental Protection Agency regulations for disposal.

Lake Oswego Parks and Recreation Department uses IPM methods to refrain from having to use pesticides within the parks system. IE: Mulching, installing pest resistance plants, proper watering, proper fertilization, pruning, hand weeding, biological controls, etc. Once IPM methods have been used then chemical means may be required to control pests within the parks system.

Worker Protection Standard

In 1992, the U.S. Environmental Protection Agency (EPA) issued regulations pertaining to the Worker Protection Standard (WPS) for pesticides. The WPS is designed to protect employees engaged in pesticide application from occupational exposure to pesticides.

The WPS is intended to reduce the risk of pesticide poisoning and injuries to pesticide applicators through appropriate measures.

The WPS contains requirements for notifying employees of applications, the use of personal protective equipment (PPE) and restrictions on entry into treated areas. The WPS also requires that certain actions be taken by employers to ensure worker safety.

WPS provisions are intended to:

1. Eliminate worker exposure to pesticides.
2. Mitigate any exposure that might occur.
3. Inform employees about the hazards of pesticides.
4. Eliminate pesticide exposure during handling. Handlers are prohibited from applying pesticides in a way that will expose workers or others.
5. PPE – The employer is required to provide PPE and appropriate training for the handlers.
6. Handlers are required to utilize, store, and maintain PPE as stated on the product label.

Definition of PPE: Apparel and devices worn to protect the body from contact with pesticides or pesticide residues. Although the following attire may not be defined as PPE, the labeling of pesticides may require the applicators to wear it for application tasks. If such non-PPE is required, the employers and applicators must follow minimal product label requirements for PPE and make sure that it is worn.

- Long-sleeved shirt
- Long pants
- Appropriate footwear as listed on the label
- Other items of regular work clothing
- Gloves—hand coverings listed on the label. Gloves or glove lining made of cotton, leather, or other absorbent materials must not be worn during the handling or application of pesticides.
- Protective eyewear—goggles; face shields or safety glasses with front brow and temple protection.
- Respirator—A device that will protect the respiratory system. The respirator will be appropriate for the pesticide product as per the label.

Practices and Procedures

Approved Pest Control Strategies

This is a short list of examples of possible control strategies among the many available.

Prevention through policy, planning, and maintenance practices is the first priority.

Next in priority are controls through cultural and mechanical practices, trapping, and biological controls.

Applications of biological products and chemical products are to be considered last.

Prevention

- Acceptance of natural settings and natural appearances must be considered: The level of care will be determined per site. Some sites, athletic fields for example, will receive a high level of care. Where open spaces will be left more natural.
- Prioritization of park areas for control measures: Different park areas have differing standards of acceptable care and appearance.
- Establishment of thresholds for action and the level of tolerance for different pests: These thresholds vary according to plant, pest, and site. Determination of action thresholds will be made on a case-by-case basis.

Design and plant selection

- Use of disease or pest-resistant/tolerant plant species, which may include native varieties
- Replacement or removal of pest-susceptible plants
- Elimination or modification of problematic areas
- Proper and adequate spacing of plant material to reduce the incidence of insect and disease problems
- Maintenance of high species diversity and elimination of monocultures in plantings
- Elimination of alternate hosts for diseases.
- Selecting plants that are more adaptable to climate changes.

Practices and Procedures

Control Through IPM Techniques

Cultural Practices

- Knowledge of culture of individual genera or species to provide the proper conditions for optimum plant health and pest-resistance.
- Adequate site preparations before plantings are installed. This can include soil improvements, pruning of surrounding vegetation, soil grade adjustments, drainage improvements, and installation of irrigation systems.
- Proper timing and use of water. Elimination of drought and heat stress to promote plant health.
- Proper timing and use of fertilization. The negative effects of over-fertilization on the target plant as well as run-off to surface and groundwater must be considered.
- Use of cover crops or leaf litter to improve soil structure and reduce soil erosion.
- Planting of resistant plant species as replacements for removed plants.
- Aeration and/or over-seeding of turf and compacted areas.
- Raking and debris removal to remove possible contaminants.
- Using proper sanitation to prevent spread of pests.
- Proper timing of mowing to reduce and/or avoid weed seed production.

Mechanical Controls

- Removal of diseased, damaged, or dead wood from the plant.
- Pruning and plant removal to promote air circulation and light penetration for healthier plant growth.
- Mechanical edging of turf.
- Removal of spent flowers that easily reseed on shrubs and perennials.
- Hand clearing in rough areas.
- Hand weeding in shrub beds.
- Weed-eating area to remove large areas of weed.
- Mowing of rough areas for vegetation control.
- Burning weeds down.

Non-chemical Controls

- Traps: yellow sticky boards, traps for mammalian pests.
- Biological Controls: naturally occurring and introduced insect or disease parasitoids, predators, and microbial products.

Chemical or Spray Controls

- Pheromone traps
- Petroleum based horticultural oils
- Insecticidal soaps

- Botanically and bacterially derived pesticides (some disease control products contain fungi as biocontrol agents)
- Artificially synthesized pesticides
- Practices and Procedures

Practices and Procedures

Criteria for Choosing a Pest Control Method

All personnel responsible for pest control should consider all of these and any other factors that are relevant to the selection of a pesticide.

Possible Health Effects & Toxicity

Both acute (having and experiencing a rapid onset and short but severe course) and chronic (being long-lasting and recurrent) to the:

- Applicator
- Public
- Target pest
- Beneficial and non-target organisms including insects, birds, aquatic organisms, and mammals.
- Non-target plants
- Surrounding environment, bioaccumulation.

Costs

Both short and long term as it relates to:

- Material costs
- Application costs
- Length of control
- Environmental costs

Physical Characteristics of the Product

More detail as above

- Residual effect and length, decomposition rates and breakdown products.
- Ability to be tank mixed with other products.
- Volatility at different temperatures.
- Product and package size and form.
- Leachability: Solubility, surface and soil bonding capability of the pesticide.
- Flammability of the product.
- Ease of cleaning equipment after use.
- Use of chemicals with different modes of action to prevent plant resilience.

Practices and Procedures

Special Considerations

For each situation, consider:

- The kind of use a given area might receive. Consider what will enter the area treated and what kind of activities will take place.
- Application equipment available and the method of delivery.
- Current and anticipated weather conditions such as wind, rain, humidity, and temperature. The applicator should be aware of any existing or forecast temperature inversions
- Site conditions such as soil type, slope, grade, drainage patterns, and the presence of open or seasonal water.
- Previous pesticide applications to the site and the interval between treatments.
- Development of pest resistance to particular control methods. Proper rotation of chemicals, such as alternating pesticide products, can minimize the risk of resistance in certain cases.
- Residual buildup of pesticides in soil, water, or target site. The cumulative effect of repeated applications may need to be considered.
- Positive and negative synergistic effects of combining pesticides. Compatibility of different pesticides may be of concern, both regarding their physical traits, as well as their effects on the target pest or beneficial organisms.

Practice #1: Licensing and Continuing Education of Pest Control Personnel

Background

This policy defines the education and licensing requirements for The Lake Oswego Parks & Recreation Department personnel who are applying pesticides or supervising others applying pesticides. The Lake Oswego Parks & Recreation Department desires to remain current in the practices of the trade. Continuing education helps to keep personnel up-to-date on pest control methods.

The Lake Oswego Parks & Recreation Department requires that pesticides be applied by a licensed pesticide applicator. In order to maintain licensing, the applicator must acquire a minimum of 40 hours of accredited supplementary education over a five-year period. No more than 15 hours may be accumulated per year. The Lake Oswego Parks & Recreation Department makes re-certification training available to its employees each year. The Lake Oswego Parks & Recreation Department desires to maintain the highest standards for professional conduct and will continue to equal or exceed the minimum requirements of the State.

Practices

All Lake Oswego Parks & Recreation Department personnel handling, or applying pesticides shall be a licensed applicator or supervised by a licensed applicator. The Lake Oswego Parks & Recreation Department will continue to provide supplementary education to maintain licensing. All pesticide applicators are expected to participate in these training opportunities to enhance and maintain their expertise in pest management. Ultimate responsibility for maintaining a valid license lies with the applicator.

The Lake Oswego Parks & Recreation Department will keep pesticide applicators informed of, and will pay for, approved supplemental education and licensing fees to meet continued certification and licensing requirements.

Practice #2: Control Methods for Pest Problems

Background

The Lake Oswego Parks & Recreation Department uses the principles of Integrated Pest Management in managing property. The following terms are used as defined with example:

- **Threshold:** The level of pest presence above which action should be taken before aesthetic compromise or unacceptable amounts of danger or injury are likely to occur.
- **Action level:** The point at which control measures are necessary to prevent a pest population from exceeding the threshold.
- An example of threshold and action level is as follows.
- **Threshold:** 20% of an athletic field is clover, someone was stung from a bee on the flower of the clover
- **Action level:** Field Technicians report to the Parks Manager to approve the action to be taken for the clover removal.

Practices

The Lake Oswego Parks & Recreation Department shall use Integrated Pest Management principles in managing pest problems. Staff shall monitor plant status, pest presence, thresholds, and action levels. The staff shall use the “Approved Pest Control Strategies”, as per page #6, to determine an environmentally sound and cost-effective pest control method.

If a pesticide is chosen as the best method for control, then staff shall use the “Criteria for Choosing a Pest Control Method” as per page #8. After controls have been made, the results should be monitored for effectiveness.

Practice #3: Use of Personal Protective Equipment

Background

This practice outlines the requirements for the use of protective clothing and equipment by Parks personnel when applying pesticides. Specific information on protective equipment is available on the product label and in the Safety Data Sheets.

Practices

Personnel engaged in any way with the contact of pesticides shall follow all of the clothing and equipment requirements listed on the pesticide label, or in the Safety Data Sheets for the appropriate pesticide.

The clothing and personal protective equipment shall be provided by The Lake Oswego Parks & Recreation Department on a regular basis. Time will be made available to wash up before lunch and at the end of the day. The applicator is responsible for cleaning, storing, and maintaining spray clothing and equipment in a safe and useful manner.

Practice #4: Storage of Pesticides

Background

This practice defines the method and procedure for storing pesticide materials. Several agencies are involved in regulating certain aspects of pesticide storage. No agency has comprehensive authority. Agencies involved include State of Oregon Department of Agriculture, Oregon Department of Environmental Quality, U.S. Environmental Protection Agency, Oregon State Fire Marshall, and The Lake Oswego Fire Department

Practices

Pesticides or pesticide containers shall be kept in secure and safe locations in accordance with existing laws. They shall be kept locked up and, if possible, in a heated, well-ventilated area. Areas used for storage shall be labeled.

Pesticides shall be safeguarded from environmental damage (for example, including, but not limited to freezing, vaporizing, photodecomposition or exposure to excess moisture). All pesticides in stock shall be inventoried annually and, if necessary, rotated on the shelf to assure that the oldest dated items are used first.

The Lake Oswego Parks & Recreation Department staff will clean each pesticide storage facility. The frequency of cleaning will be monitored by supervisory personnel, but will not be less than once per year.

The Lake Oswego Parks & Recreation Department staff will inventory each pesticide storage facility. The frequency of inventory will be monitored by supervisory personnel, but will not be less than once per year.

Pesticides being transported shall be appropriately and safely secured in the vehicle. Only licensed pesticide applicators shall transport pesticides. An appropriate spill kit must be immediately available for the materials being transported.

Pesticides shall not be transported in passenger cabs of vehicles.

Practice #5: Pesticide Application and Record Keeping

Background

This practice outlines methods for record keeping related to pesticide application by Lake Oswego Parks & Recreation Department personnel. State law requires that written records be kept and that licensed applicators record the details of pesticide applications and keep these records for no less than three years. These records must be stored in a central location and be available for review.

Practices

It is the practice of the Lake Oswego Parks & Recreation Department to record and keep records of all pesticide applications performed by the Lake Oswego Parks & Recreation Department personnel (see Appendix #1). Copies of these records shall be kept at the Maintenance Operations Office, the Golf Course and overseen by the Parks Deputy Director and or their designee. These records shall be retained for no less than three years.

Practice #6: Notification of Pesticide Use at a Site

Background

This practice outlines the methods and procedures for notifying the public that an application of a pesticide is being made at specific park site. In 2020 the department decided to require posting of all pesticide use at the time of application for all park properties. The majority of products that the Lake Oswego Parks and Recreation Department uses do not require re-entry postings unless listed by the label but to keep park users informed we will post at time of all applications.

Lake Oswego School District and the Lake Oswego Parks & Recreation Department facilities have their own set of requirements for notification.

Practices

It is the practice of Lake Oswego Parks and Recreation to notify the public of pesticide applications on park sites with a notification sign listing targets, product used, date, time of application and any restricted entry if listed on label. These signs are posted at the site of application along pathways in highly visible locations, at conspicuous entries and at natural area trailheads. The intent of sign placement is so park users will encounter them before they enter the treated area. Signs will be removed when product is dry, dust has settled in dry or granular applications or when re-entry time has been met.

Lake Oswego School District and Lake Oswego Parks & Recreation Department facilities will be notified of targets, product used, date and time of application before it is made to their site when required.

Example of signages can be found Appendix II

*Signage practice was updated in 2020

Practice #7: Rodent Control

Background

This practice outlines procedures for rodent control measures on Lake Oswego Parks & Recreation Department managed property.

Practices

Control of rodents is considered a vector problem. Chemical or mechanical controls may be contracted out to private pest control professionals if there is a need.

Moles are controlled by mechanical means in our formal landscapes and athletic fields as necessary by Parks Staff and/or contractors.

Practice #8: Parks and Recreation Department Managed Property

Background

This practice outlines procedures for pesticide application in a safe and legal manner on property that is maintained by Lake Oswego Parks & Recreation Department employees. Directions for use, safety, mixing, diluting, storage, and disposal, as well as restrictions on re-entry, must be met as per state rules and product labels.

The law allows an applicator to:

- Apply a pesticide at any dosage, concentration or frequency less than that listed on the label,
- Use any equipment or method of application not prohibited by the label,
- Mix a pesticide or pesticides with fertilizer if the mixture is not prohibited by the label,
- Mix two or more pesticides, if all the dosages are at or below the recommended rate.

Practices

It is the practice of Lake Oswego Parks & Recreation Department for their employees to apply pesticides in a safe and legal manner on Lake Oswego Parks & Recreation Department managed property and to adhere strictly to all requirements for the safe and efficient use of pesticides.

The following criteria shall be met when applying pesticides. Some of these are addressed further in other policies.

- The label is the law.
- Safety equipment and protective clothing shall be used wherever indicated and maintained in a safe condition.
- Spray equipment shall be maintained in a safe and useful condition. Spray equipment shall be calibrated regularly.
- Anti-siphoning devices shall be used when filling spray equipment.
- "Criteria for Choosing a Pest Control Method", as outlined in "Approved Pest Control Strategies," page #6, shall be considered in making choices.
- Pesticides shall be applied only when appropriate weather conditions exist.
- Areas where pesticides are applied shall be posted with Do Not Enter signs where required by label, page #15.
- All applications shall be recorded on approved application forms.

Procedures

Applying Pesticides on Lake Oswego Parks & Recreation Department -Managed Property.

1. Certified staff will determine the threshold and action levels for the specific pest problem.
2. Control strategies are decided on by the licensed applicator, supervisor (or designee) or inspector. (Special situations may require expertise from outside Lake Oswego Parks & Recreation Department). The “Approved Pest Control Strategies” as per page #6, shall be used as a guide for decision-making.

When pesticides are to be used:

1. Choose an approved pesticide using the “Criteria for Choosing a Pest Control Method” as per the IPM strategy on page 8.
2. Check and calibrate application equipment for safety and efficiency.
3. Check weather conditions, including wind, rain, humidity, and temperature. Applications should be done with calm wind conditions to prevent drift. Adjustments should be made for droplet size and pressure if marginal conditions exist. No application should be done where there is unacceptable drift.
4. Post signs at the pesticide application site in accordance with Practice #6.
5. List re-entry specifications on the signs if required by the label.
6. Apply material according to the label and in accordance with state and federal regulations.
7. Record applications of pesticides on the Pesticide Application Record. See Appendix #1.
8. Evaluate the results of control measures.

Practice #9: Solutions and Rinses

Background

This practice outlines methods for use of remaining pesticide solutions and rinses in a legal and safe manner. Applicable laws require that all pesticide solutions and rinses be applied to target areas according to label directions. These solutions and rinses may also be disposed of at an authorized pesticide disposal site.

Practices

It is the practice of the Lake Oswego Parks & Recreation Department to conduct our pesticide operations so that disposal of material is not necessary. Pesticide solutions and rinses are applied according to the label and to legal target areas so there are no remaining pesticides. This shall be accomplished by accurately gauging the amount of pesticide needed for the job. The Lake Oswego Parks & Recreation Department promotes the use of advance planning to minimize the number of times it is necessary to switch pesticides in spray equipment. In order to reduce the amount of excess rinsate, it is the practice of Lake Oswego Parks & Recreation Department to rinse equipment only at the end of the spray cycle or when changing to pesticides that are incompatible with those in the tank.

Procedures

Following are some considerations to make before starting to spray to ensure the proper amount of pesticide is mixed.

Advance considerations:

- Weather conditions and predictions.
- Acreage / square footage of the job site.
- Calendar: special events, mowing, irrigation, etc.
- Type and size of the equipment appropriate to do the job.
- Mix only enough product to perform the job.

Rinse the sprayer if the following conditions apply:

- It is necessary to use a pesticide that is incompatible with that previously used.
- It is the end of a spraying cycle.

Use the following rinse process:

1. Read the pesticide label. The following should not conflict with label information or state or federal regulations. Contact your supervisor if you see a conflict or have questions.

2. Wear protective clothing, as listed on the label or in the Safety Data Sheets when handling pesticides, pesticide containers or pesticide equipment.
3. Fill the spray equipment approximately 1 / 4 full with clean water. Add a neutralizing agent if the pesticide label recommends one. Shake or agitate so that all inside surfaces are washed. If possible use the spray hose to rinse the inside surface of the tank. These procedures should coincide with all label regulations.
4. Spray the rinse water out of the spray equipment onto an approved target area IE: Landscape bed. Rinse water should be run through all hoses, booms, etc. Filters should be cleaned. Because of the dilute nature of the pesticide in the rinse water, a coarse spray can be used and it is recommended to save time. Do not “pond” or saturate the soil.
5. If the tank is to be stored, repeat steps 3 and 4 above, without a neutralizing agent.

Practice #10: Unusable Pesticides and Equipment

Background

This practice defines the methods and procedures for disposing of pesticide containers and unusable pesticides or those pesticides whose registrations have been totally or partially suspended.

The Lake Oswego Parks & Recreation Department considers proper disposal of pesticides and pesticide containers to be of the utmost importance to the safety and well-being of employees and the public.

Several governmental agencies regulate pesticide disposal. No one agency has comprehensive authority. Agencies involved may include the Oregon State Department of Agriculture, Oregon Department of Environmental Quality, U.S. Environmental Protection Agency, and state and federal Occupational Safety and Health Administration (OSHA) programs.

Practices

The Lake Oswego Parks & Recreation Department shall dispose of pesticides and empty pesticide containers in accordance with all State and Federal regulations and label recommendations. The disposal of these materials requires care in handling and use of all necessary protective equipment.

Procedures

Read the pesticide label. The following steps should not conflict with label information or state and federal regulations. Contact your supervisor if you see a conflict or have questions.

Wear protective clothing when handling pesticides or pesticide containers, as listed on the label or on the Safety Data Sheets.

Non-rigid containers (including bags and sacks)

1. Pesticide material must be emptied into application equipment to the extent made possible by physical agitation of the container.
2. Visually verify that residues have been removed.
3. Roll up the container when empty.
4. Dispose as per label.

Rigid containers (such as plastic or metal)

1. Pesticide material must be emptied into application equipment to the extent possible by pouring, then visually verifying that the residues have been removed.

2. The container must be at least triple-rinsed with clean water until clean, with the contaminated rinse water being poured into the spray equipment. Empty the pesticide and all rinses into the sprayer before the full amount of diluting water is added to the spray equipment. After the container is clean, it shall be punctured and crushed.

3. Dispose as per label.

Disposal of Unusable Pesticides

Unusable pesticides are ones that:

- i. are damaged through vaporization, freezing, infiltration of moisture to containers, or photo decomposition;
- ii. have exceeded their shelf life; or
- iii. have visually changed their composition or structure in some manner.

1. The Parks Deputy Director and or their designee should be informed of the plans in advance to dispose of pesticides.

2. The person disposing of pesticides should keep a record of distribution on file for three years stored with the other spray records.

3. If the pesticide has reduced effectiveness for example, due to the long storage, moisture or freeze damage, follow the recommendations of the dealer, manufacturer, or licensed consultant and use procedures in this practice as they apply.

- If this option cannot be followed legally, follow recommendations of the dealer or manufacturer or licensed consultant. It is not legal to transfer damaged or altered pesticides to another party for use. It may be necessary to arrange for disposal of the pesticide in a manner recommended by D.E.Q.

Disposal of Pesticides with Totally or Partially Suspended Registrations, which are rendered legally unusable by the Lake Oswego Parks & Recreation Department.

1. Keep up-to-date on the industry news and status of current product registration.

2. Follow recommendation of the manufacturer or dealer in finding a legal user for the pesticide.

3. If the pesticide is unopened and/or still retains its integrity, it may be possible to transfer the pesticide to a legally registered bureau, agency or group for use.

4. Dispose of the pesticide in a manner recommended by D.E.Q.

Practice #11: Accidental Pesticide Exposure

Background

This practice defines Lake Oswego Parks & Recreation Department's response to inquiries by employees and the general public concerning adverse health effects as a result of accidental exposure to pesticides. Due to public concerns, handling of inquiries needs to be professional, calm and prompt.

In the event of accidental exposure, staff should immediately contact the Lake Oswego Fire Department.

Practices

The Lake Oswego Parks & Recreation Department will keep employees who apply pesticides informed of proper procedures to be taken in case of pesticide exposure. Anyone inquiring about pesticide exposure will be referred to his or her personal physician, the Oregon Poison Center (OPC), and the Pesticide and Analytical Response Center (PARC). City of Lake Oswego employees contact the Concentra Urgent Care. A list of these authorities and their phone numbers are listed in Appendix III. A physician who does not deal in these issues could use this list for reference. This list shall be reviewed and updated yearly.

Safety Data Sheet information is available online to all personnel for their own use. This information includes symptoms produced by the product and procedures for handling overexposure to individual pesticides. If symptoms of illness occur during or shortly after applying pesticides, call OPC or get the patient to medical attention immediately.

Non-emergency questions received by Lake Oswego Parks & Recreation shall be referred to the Park Deputy Director and or their designee. He / she will refer the questioner to the appropriate individuals or sources for more information.

Procedures

Use planning to avoid emergencies and to expedite aid should an accident occur.

- Research symptoms and problems of each pesticide to be used, in Safety Data Sheets.
- Use all safety procedures and protective gear as recommended on the label or in the Safety Data Sheets.
- Have a copy of the appropriate label available while applying or transporting pesticides both concentrated and diluted.

In case of a medical emergency related to suspected pesticide exposure:

- Handle any emergency situation as per First Aid instructions.
- Call 911 for emergency backup if necessary.

- Refer to Oregon Poison Center.
- Take a label for reference for medical personnel if it is necessary to leave the site.
- Inform your supervisor as soon as possible.

In response to a non-emergency inquiry:

- Respond to simple direct questions.
- Refer further questions or concerns to your supervisor.
- Inform your supervisor.

Practice #12: Community Gardens

Background

The existence of community gardens within parks raises the need for special considerations. The gardeners of the Community Gardens Program are of diverse backgrounds and have differing views about pesticide applications in and around the gardens. Since many of the crops derived from the gardens are food crops, care is needed to ensure its quality.

Practices

In order to protect food derived from Community Garden sites, be sensitive to the differing viewpoints of the program participants, and adhere to the policies of the Community Gardens Program, the following rules are in effect:

- Garden guidelines limit the use of herbicides on Community Garden sites. This specifically refers to garden plots, and pathways.
- Mechanical means, such as cutting, hoeing and mulching, can be used to remove or control weeds in the Community Garden sites and perimeter is main method of weed control.
- Garden participants are not allowed to spray herbicides on Community Garden Plots.
- As a last resort the use of pesticides must be approved by the Parks Manager.
- We will operate as per the IPM strategy on page 6.

Practice #13: Worker Protection Standards

Background

The Worker Protection Standard (WPS) is a regulation issued by the Environmental Protection Agency. To reduce the risk of pesticide related illness and injury, standards for training, protection, and mitigation were adopted.

Practices

The WPS requires that steps are taken to reduce the risk of pesticide-related illness and injury to the handlers and workers exposed to pesticides. It is therefore essential that all WPS requirements be satisfied for all employees involved with entry into areas where pesticides may be applied.

This is accomplished by the following:

Training

- Pesticide safety training.
- Display of WPS safety poster.
- Access to labeling information.
- Access to application records.

Practices

- Proper pesticide applications.
- Exclusion of workers from areas being treated.
- Adherence to the Restricted-Entry Interval (REI).
- Provision of decontamination sites for handlers and workers.
- Emergency medical and transportation assistance availability.

Practice #14: Non-Lake Oswego Parks Department Employees

Background

Pesticide applications that are carried out by personnel other than Lake Oswego Parks & Recreation Department employees, such as those done by private contractors must undergo a preliminary approval process before the work begins.

Practices

Contractors anticipating pesticide use shall submit a proposed pesticide application plan to the Parks Deputy Director and or their designee for evaluation. The form must list all the details of the proposed application. Contractors shall provide both commercial operators and applicators license numbers. They must identify and describe fully the materials to be applied, proposed methods, equipment employed, the purpose of the application, and supply the appropriate labels and SDS information. They must also follow all Lake Oswego Parks & Recreation Department notification procedures that will be used.

Furthermore, they must satisfy all of the additional Lake Oswego Parks & Recreation Department contractual language pertaining to pesticide applications. These subjects may include safety precautions, liability issues and responsibilities. These issues are dealt with in the contract language agreed to before the project has begun by the Parks Deputy Director and or their designee and the contractor.

The City of Lake Oswego does not approve volunteers applying chemicals on public lands, nor does State law. State law requires that anyone applying chemical on public lands must be a "public lands certified"

Procedure

After receiving the contractor proposal, the Park Deputy Director and or their designee shall review the proposal and approve or deny the request based on the principles of this practice. The same criteria for determining the best method of pest control for Lake Oswego Parks & Recreation Department applications shall be applied to the evaluation of contractor proposals. IPM techniques and methodology shall be required and employed.

Practice #15: Pesticide Spill Prevention / Response

Lake Oswego Parks and Recreation personnel will employ a variety of practices to reduce the potential of a pesticide spill. These will include the following:

Training

Lake Oswego Employees are to be trained to locate and read the Safety Data Sheets (SDS). Employees will also be trained in proper hazardous waste containment, to include communication with the city's hazardous response team.

Purchasing

When procuring chemicals, a factor in determining which chemical formulation to purchase will be the ease with which it can be cleaned up in the event of a spill. Types of packaging and formulations that may help to prevent a spill from occurring will be factors as well. Characteristics of the pesticide, such as toxicity and reactivity that may affect the seriousness of a spill, will also be considered.

Preparation

Planning, training of personnel, and acquisition and maintenance of equipment and supplies will be done to reduce the risk of a spill occurring, and to minimize damage, should one occur. For example, regular preventative maintenance will be done on sprayers, replacing hoses and valves before they wear out. Transportation of chemicals will be as minimal as possible, IE: mixing onsite etc.

Work Practices

Maintenance personnel will use practices to minimize the potential for a spill to occur and to ease clean up should one occur. For example, pesticides should be placed in a leak-proof container while being transported.

We will operate as per the IPM strategy (above).

Practice #16: Waterways Pest Management

General Goals and Philosophy

Lake Oswego Parks and Recreation Department recognizes the special importance of the rivers, streams, ponds, water quality facilities, and wetlands that fall under our stewardship. The sensitive nature of such habitats, their plant and animal communities, and their direct link with other waterways require that we establish specific practices to ensure their integrity. This addition to the Lake Oswego Parks and Recreation Department Pest Management Program outlines this special treatment. It establishes clear guidelines and limitations regarding maintenance methods and materials for both these waterways and the parklands adjacent to them.

As in the rest of the Pest Management Program, Integrated Pest Management principles will be employed in all landscape management decision-making. Control of unwanted vegetation, diseases, and pests will follow the IPM decision-making rationale.

- Proper planning and management decisions begin the IPM process.
- Cultural methods of vegetation and pest control are preferred and will be employed next.
- Mechanical means of vegetation and pest control are next in line of preference, and will be utilized where feasible.
- Biological methods of vegetation and pest control are to be considered where and when they are feasible.
- Botanical and synthetic pesticides will be used when other method is not feasible.
- Products used near waterways have to be approved for aquatic use.

Management Practices, Materials, and Limitations

For Parks Waterways and Buffers

Definitions

The buffer zone and high-water line referred to in this practice is defined as a corridor of land that is defined by Oregon Division of State Lands

Application Equipment Used

Pesticide delivery for all listed areas in this practice will be carried out by hand with directed, low volume, single wand sprayers, wiping, daubing, and painting equipment, injections systems, or drop spreaders. Typically, this is done by backpack sprayers, but may also include sprayers with larger fill tanks as long as the same kind of hand application methods is used. These methods of delivery result in low volume applications and low-pressure spraying. This minimizes the formation of fine mists that

might be carried off target. These practices ensure that applied materials will reach targeted plants or targeted soil surfaces.

Pesticide Drift

When applications of pesticides are being made within the buffer zone, great care will be exercised in the process. Drift control is of particular importance when surface waters are nearby. Equipment used in the application shall employ all necessary methods to limit drift. Nozzle size, pressure regulation, droplet size, and height of spray wand, are all techniques that can be modified to reduce unwanted drift of pesticides.

Spray applications will not be allowed in the buffer zone when:

- Wind speed is above 5 mph.
- Wind direction or activity would carry pesticides toward, or deposit them upon open water.

Pesticides Available

To more clearly regulate any possible aquatic impacts, the Lake Oswego Parks and Recreation Department Pesticide Approval Committee shall approve the herbicides used in these buffer zones.

Materials available for tree injections in buffer zones:

In the event a pest or disease threatens the health of important and valuable trees within a buffer zone, there may be a need to treat them. Instances of this occurring are rare. However, in these special cases, the use of injectable pesticides may be employed when necessary, with the following limitations. The pesticide applied must be delivered by methods that inject or otherwise distribute the material entirely within interior tree tissues. Pesticides will not be injected into the soil surrounding the tree. Tree surfaces will not be sprayed or treated with pesticides. The intent and limit of this exception to the approved buffer zone, is the necessity to combat direct threats to the health of valuable trees.

Materials for all other areas:

The Lake Oswego Parks and Recreation Department general Pest Management practice approved pesticides may be used outside the waterway and buffer zones, where not otherwise prohibited by this practice.

Record Keeping Requirements:

All regular application record keeping requirements will be adhered to for all pesticide applications. This includes date and the time intervals of the application, temperature and wind conditions, location of application, chemicals used, (including surfactants and dyes), concentrations used, amount applied, coverage rate, equipment used, applicator information and license number.

Additionally, record-keeping requirements will be amended for applications within the buffer zone or for aquatic situations. Standard application record forms will have space added to denote these special treatments. These special treatments will then be tracked and monitored by the Park Deputy Director or their designee. This information will be made available to agencies that request it.

Personnel Requirements

All those applying pesticides to Lake Oswego Parks and Recreation Department lands and city owned property must be Oregon Department of Agriculture licensed applicators.

Changes to the Practices

A need may arise for modifications or additions to the Lake Oswego Parks and Recreation Department Waterways Pest Management practice.

Emergency / Short Term Process

There may be situations where Lake Oswego Parks and Recreation Department cannot wait for the formal review process to take place. An example is the unlikely, but possible, introduction of a new and destructive pest that needs to be treated within a short time frame. In such a case, Lake Oswego Parks and Recreation Department representatives will develop an IPM strategy to deal with the threat.

Lake Oswego Parks and Recreation Department Buffer Zone Landscape Classification and Practices

Classification of Buffer Zone Landscapes Near Waterways, Lakes and Ponds

Park landscapes near waterways, lakes and ponds are divided into four classifications (A, B, C, & D), that describe their current features, as well as define the differing objectives and maintenance rationales of their care.

A. Highly Managed Areas

Example: Foothills Park

Features of Highly Managed Areas:

- Ornamental landscape
- Public access and activity
- High public use
- Mowing of turf, sometimes to edge of waterway
- May have facilities adjacent to water
- May have highly modified stream banks
- Often limited planting in buffer

Objectives for Highly Managed Areas:

- Healthy plants and turf.
- Maintain ability to handle high use.
- Minimize need for chemical intervention.
- Control invasive plants.
- Safe access.
- No bare soil areas.
- Low tolerance for pests.
- High expectation for aesthetics in general.

B. Intermediate Managed Areas

Example: Freepons Park

Features of Intermediate Areas:

- Stream banks have some buffering with predominately native plants.
- Some impacts from use and park development apparent.
- Managed landscape may be nearby.
- Stream bank erosion may be occurring due to use.

Objectives for Intermediate Areas:

- Maintain healthy plant buffers.
- Minimize need for chemical intervention.
- Control invasive plants where feasible.
- Minimize impact on buffer.
- No bare soil areas.
- At tolerance exists for natural appearance and pests.

C. Impacted Natural Areas

Example: Bryant Woods

Features of Impacted Areas:

- Very limited impact to these areas.
- Stream banks have buffering with predominately native plants.
- Limited impacts from use and park development apparent.
- Managed landscapes are not nearby.

Objectives for Impacted Areas:

- Maintain healthy plant buffers.
- Minimize need for chemical intervention.
- Threshold level is more tolerant of pests than in level B.

- Minimize any impacts on buffer.
- No bare soil areas.

D. Intact Natural Areas

Example: Canal Acres

Features of Intact Natural Areas:

- Very limited visitor impact.
- Native plant communities exist.
- No nearby developed park areas.

Objectives for Intact Natural Areas:

- Maintain healthy plant buffers.
- Threshold level is more tolerant of pests than in level C.
- Minimize any impacts from activities.

Management Practices for Buffer Zones of Waterways, Lakes and Ponds

The guidelines for use of pesticides and fertilizers in the buffer zones of waterways have varying levels of management. Use of pesticides and fertilizers also vary depending on whether they are being used for routine maintenance or for restoration and construction projects.

Use of pesticides and fertilizers within buffer zones of all waterways

Requires approval of the Parks Deputy Director or their designee.

Use of Mulches

Mulches and other ground coverings are often employed during the installation and restoration of landscapes as well as their ongoing maintenance. They are utilized for a variety of reasons. Mulches suppress weeds, help to retain moisture around plants, reduce possible erosion, and provide visual enhancement.

Use of landscape mulches in buffer areas should be considered for any possible impacts to the buffer as well as nearby waterways. These impacts may include:

- Inadvertent introduction of non-native weeds to the site.
- Migration of mulch material into waterways.
- Nutrient leaching into waterways.

Choices of mulches should take these concerns into account. Routine maintenance in A, B, and C class area buffers should minimize the use of mulches. Class D area buffers should use mulches only as a part of restoration activity. Mulching in areas that are below typical high-water lines is discouraged in any buffer areas. Seeding of cover

crops for erosion control is allowed in buffer zones. Use of cover crops in class D areas should

Never introduce any persistent non-native plant species.

Management Practices Within Bodies of Water, Biofilters and Wetlands

The following describes specific practices that may be used within the actual bodies of water:

Within Streams

In the rare need for control of noxious weeds and invasive non-native plants within a stream itself, mechanical and biological means will be utilized where possible. When these methods are not feasible, emergent weeds only may be controlled with an approved herbicide and surfactant if needed. Although rare, control of noxious and invasive weeds may be needed to maintain a healthy environment. Applicable permits from appropriate outside agencies will be obtained before this kind of treatment takes place. Submerged weeds will not be controlled by chemical means in streams and rivers or other moving waters.

Within Pond and Lake Areas

Within the pond or the lake, itself, herbicides will be used only for the control of noxious weeds and non-natives that threaten the health of the habitat. A list of these potential target weed species shall be developed by the Parks Deputy Director and or their designee.

When chemical methods are necessary within the pond itself, only an approved aquatic surfactant shall be employed.

In the event an emergency situation arises where habitat is endangered by non-native invasive submerged weeds in ponds and lakes, the Parks Deputy Director and or their designee may approve the use of an appropriate herbicide for control as a last resort. This will only be allowed where there is no direct outflow of the treated water to fish bearing streams or waterways. The herbicide utilized shall be very low toxicity to aquatic organisms and be applied in such a way that there are no appreciable negative effects on the health of the aquatic environment.

Within Wetland Areas

Example: East and West Waluga Parks

Within the wetland itself, herbicides will be used only for the control of noxious weeds and non-natives that threaten the health of the habitat. A list of these potential target weed species shall be developed by the Parks Deputy Director and or their designee. When chemical methods are necessary within the wetland itself, only an approved aquatic surfactant shall be employed.

Within Biofilters, Bioswales, and Pollution Reduction Facilities (PRF's)

Example: Hazelia Field

These systems intercept storm water run-off of surfaces before it reaches the waste water system or other drainages. Pre-emergent herbicides will be allowed where necessary only in shrub beds above the high-water line. For post emergent applications, PRF buffers will be treated as a B class streamside buffer. If bioswales lie within the buffer area of any of the above listed waterways, they will have the same maintenance restrictions upon them as any other buffer zone. If the bioswale has an outlet to any surface water, its treatment will follow the same restrictions as a B class streamside buffer. If there is no outlet to surface water, the buffer may receive the same treatment as general parklands.

Practice #17: Mulch Management in Parks

Use of Mulches

Mulches and other ground coverings are often employed during the installation and restoration of landscapes as well as their ongoing maintenance. They are utilized for a variety of reasons. Mulches suppress weeds, help to retain moisture around plants, reduce possible erosion, and provide visual enhancement.

Use of landscape mulches in buffer areas should consider any possible impacts to the buffer as well as nearby waterways. These impacts may include:

- Inadvertent introduction of non-native weeds to the site.
- Migration of mulch material into waterways.
- Nutrient leaching into waterways.

Choices of mulches should take these concerns into account. Routine maintenance in A, B, and C class area buffers should minimize the use of mulches. Class D area buffers should use mulches only as a part of restoration activity. Mulching in areas that are below typical high-water lines is discouraged in any buffer areas. Seeding of cover crops for erosion control is allowed in buffer zones. Use of cover crops in class D areas should never introduce any persistent non-native plant species.

Practice #18: Golf Course

Use of Mulches

The Golf Division will follow the same guidelines established in the Parks Division.

The golf course will occasionally require use of alternative products to keep the quality of the greens and tees playable. If toxicity is higher than table salt (LD 50=2500), the course will be posted at the clubhouse and at the 1st and 10th tee/ green

SDS sheets will be posted in the golf course club house.

All buffer zones will be referred to in the same manner as practice #16.

Disclaimer

The use of pesticide trade names in this document does not constitute an endorsement by the Lake Oswego Parks and Recreation Department. Trade names have been used specifically for reasons of reader familiarity and no discrimination is intended.

Also, if trade name listed product is not available for use another product with comparable properties maybe substituted. Situations such as list trade name has been out due to supply shortages have occurred in the past.

Appendix I - Pesticide Application Log

Chemical Application Record		<i>PLEASE PRINT LEGIBLY</i>				
				Date:		
City of Lake Oswego-Parks Maint.		Name of Applicator:		Start Time:		
		Applicator License #:		End Time:		
		Location:				
Equipment Used:		Reason For Application:				
Backpack sprayer		Weed Control	Rodent Control	Plant growth reg.		
Broadcast spreader		Disease Ctrl	Slug Control	Other:		
Drop spreader		Moss Control	Insect Control			
Mechanical sprayer		Weather Condition:				
Boom Sprayer		Sunny	Cloudy	Rainy		
Other:		Cool	Warm	Hot		
		Wind speed:	Temp:			
		Purchased From:				
		Pro Turf Sply	Marion Ag	Wilber Ellis		
		Other:				
LIQUID						
Chemicals:	EPA #	Application Rate				Amount of Chemical Used
SureGuard SC	71368-114	.17 oz or 5 ml per gal.				
Rodeo 53.8%	62719-324	.5 oz per gal.	.75 oz per gal.	1.5 oz per gal.	2 oz per gal.	
Speed Zone	2217-833	.5 oz per gal.	.75 oz per gal.	1.5 oz per gal.	2 oz per gal.	
Garlon 3A	62719-37	.5 oz per gal.	.75 oz per gal.	1.5 oz per gal.	2 oz per gal.	
Vastlan	62719-687	.5 oz per gal.	.75 oz per gal.	1.5 oz per gal.	2 oz per gal.	
Surfactant:						
Competitor		1 oz per gal.				
Crop Oil		1 oz per gal.				
Blue Highlight		.5 oz per 3 gallons				
GRANULAR						
Chemicals:	EPA #	Application Rate				Amount of Chemical Used
Snapshot	62719-175	3 lbs. per 1000 sq. ft.				
Ronstar G	432-886	100-200lbs per acre-depends on application				
<u>Exact Area Treated/Area Size: (Explain in detail)-</u>						
<u>Additional Applicator:</u>						
<u>Applicator phone #</u>						
<u>Additional Notes:</u>						

Appendix II - Application Notification Sign Example

Herbicide Application Today

Licensed applicators are selectively treating
non-native or invasive weeds in the park today.

Blue dye indicates where herbicide has been applied.

Please stay on trail and
keep your dog on a leash to avoid contact.

Your cooperation is appreciated

Date _____

Materials used:

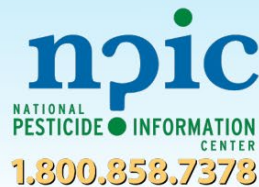
- Rodeo, EPA Reg. No. 62719-324
- Vastlan, EPA Reg. No. 62719-687
- _____
- _____

For questions about herbicides, please visit:

National Pesticide Information Center
npic.orst.edu

For questions about our work please call:

503-534-5436



Appendix III - Emergency Contact List

Lake Oswego Fire Department 911

LOCOM Non-Emergency 503-635-0238

**Oregon Poison Center Emergencies: 1-800-222-1222 Pesticide
Analytical Response Center: 503-986-6470 or 211**

Concentra Urgent Care: 503-675-7603

Appendix IV - Approved Pesticides

Following are lists of pesticides that are approved for use in specific work units in parks. Part of a good IPM approach allows for the choice of ideal materials for a specific need and for managing pest resistance with rotations of different products rather than using a "one material fits all" approach.

It is also important to understand that pesticide applications are used after other IPM strategies have first been either employed, or considered. The majority of Lake Oswego Parks & Recreation pest management practices never involve the use of pesticides. Similarly, the majority of park acreage never receives any kind of pesticide application. Other IPM strategies Lake Oswego Parks & Recreation employs include prevention of pests through policy, design and selection, and control of pests through cultural practices, physical means, and mechanical methods.

All pesticides available for use within parks must first be placed upon an approved list after undergoing a centralized review process that carefully examines the characteristics of the individual product and whether it would be an appropriate addition within our program. Issues of efficacy, public health and safety, potential environmental impacts, overall plant health requirements, land management needs, and other concerns are considered during this process. Applicators within a specific work unit must then make their choices of materials from the specific work unit approved list. Individual work units have different responsibilities and pest management requirements for the lands under their care. The individually tailored approved lists reflect these differences. Occasionally, subsets of work units may receive approval for certain materials that are not on their general approved list.

All applicators in each work unit are limited to the pesticides appearing on their specific approved list. Careful attention should be paid to the further limitations of pesticides available for use within waterway buffer zones and aquatic sites as outlined and defined in the Waterways Policy. Additions to the approved lists must follow the process as described in the "Pesticides Approved for Use in Parks" Policy.

Note this list is not exclusive. It includes materials currently used or may be used in the future. Other materials may be considered for use depending upon the given conditions for different situations. The Golf Course, for example, is highly dependent upon good quality greens for its economic success. Even with cultural practices which will relieve winter turf disease pressure, it is still necessary to use fungicides to meet golfer expectations.

Appendix V – Alternate Chemical Usage

Alternate Chemical Usage Form			
Date of Application		Brand Name	
Active Ingredients			
Application Method			
Application Rate			
Applied By		License Number	
Approved By		Title	
Summary of Usage			

2023 Approved Pesticide List

Post-emergent		Parks	Natural Areas	Golf Course
Rodeo (Aquatic Formulation)	Glyphosate	X	X	X
Cheetah Pro (Glyphosate alternative trialing)	Glufosinate ammonium	X	X	X
Garlon 3A or Vastlan	Triclopyr	X	X	X
Milestone	Triisopropanolammonium salt of 2-pyridine carboxylic acid, 4-		X	
Transline	dopyralid: 3,6-dichloro-2-pyridinecarboxylic acid, monoethanolamine salt		X	
Imazapry (Japanese Knot weed only)	(2-[4, 5-dihydro 4-methyl-4(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-		X	
Select Max (Grass Control)	clethodim		X	
Poast (Grass Control)	sethoxydim		X	
Speedzone	2,4-D, 2-ethylheyl easter, Mecoprop-p acid, Dicamba	X		X

Pre-emergent		Parks	Natural Areas	Golf Course
Sureguard	Flumioxazin	X		X
Ronstar G	Oxadiazon	X		
Snapshot	Trifluralin			X

Surfactant		Parks	Natural Areas	Golf Course
Competitor	Surfactant	X	X	
Crop Oil	Mineral Oil Polyoxyethlated	X	X	
Class Act	Surfactant		X	

Fungicides		Parks	Natural Areas	Golf Course
Turfcide	Pentochloronitrobenzene 40%			X
Prophecy	Propiconazole .72%			X
Instrata	Propiconazole 4.7% Fluidoxinol 1.2%			X
Affirm	Polyoxin D zinc salt 11.3%			X
Secure	Fluazinam 40%			X

References

1. Oregon Department Environmental Quality www.deq.state.or.us.
2. Fisher, Glenn, et al. Pacific Northwest Insect Control Handbook, March, 2009. Agricultural Communications, Oregon State University, Washington State University and University of Idaho.
3. Shenk, Myron, Oregon Pesticide Safety Education Manual, January, 2004. Agricultural Communications, Oregon State University, Washington State University, and University of Idaho.
4. Oregon Department of Agriculture-web site:
<http://www.oregon.gov/ODA/PEST/index.shtml>.
5. Myron Shenk. Oregon Pesticide Applicator Manual 2006. Pesticide Safety Education Program Coordinator, Oregon State University, Washington State University, and University of Idaho.
6. Tualatin Hills Park and Recreation Department.
7. National Pesticide Information Center <http://npic.orst.edu/>.