

## **2008 PARKS DIVISION PESTICIDE REPORT**

### POLICY REGARDING PEST MANAGEMENT ON CITY PROPERTY 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.
      - i. Following review of the available data a list of pesticides acceptable for use on city property will be generated.
    - 2. 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 2008

The I.P.M. Coordinator for the Parks Division is Ray Shane, Golf Program Supervisor. He can be reached at 838-3920. The Parks Division consists of several Sections with each Section Supervisor being 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 application of any pesticide, and all record keeping as required.

The Park Division is happy to report that their 2007 Annual Report was reviewed by the Pesticide Management Advisory Committee and that the Committee concluded that Parks was compliant with the policy and regulations.

### **2008 GENERAL PARKS**

General 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, mediums, bike paths, and specialty areas such as football, soccer, tennis courts, disc golf, baseball and softball fields. Total acreage of general parks is in excess of 6,000 acres.

Non-Pesticide activities in General Parks include hand weeding in flower and shrub beds, mowing of dandelions and thistle versus treatment, increased low maintenance acreage, string trimming and mulching around trees versus Round-up applications, regular sharpening of blades to reduce plant injury along with aerification of athletic fields to reduce compaction and thatch control.

Parks is thankful to all of the volunteers that assisted us in our non-pesticide control efforts.

Friends of Yahara River Parkway (FYRP)

Garlic Mustard removal

Yahara Park Place, Buckthorn removal

Friends of Hoyt Park

Friends of Monona Bay

Owen Park Restoration

Cherokee Marsh wetland restoration

Flower gardens

More than 6,000 hours of labor for mechanical and cultural control was provided by volunteers in 2008!

Pest management will be similar in 2009

### **SUMMARY OF COMPLAINTS RECEIVED**

No complaints were received.

### **EAST PARKS**

Pesticides are only used in places where citizens, groups, or companies pay to use our athletic facilities. In 2008 these facilities included: Warner Stadium, Warner Soccer, Warner Softball, Breese Stevens Field, Reindahl Field, Olbrich Softball Diamonds, and Bowman Field. The general purpose of using pesticides is to spot treat weeds in diamonds, under bleachers, along fences, and on warning tracks. We also use them when we use a "weed and feed" blend, to help establish and maintain quality turf on the above-mentioned playing fields.

Chemical use at each of these locations are illustrated in the figures below.

#### **Warner Soccer**

| <b>Chemical</b> | <b>Amount Product Used (lbs)</b> |
|-----------------|----------------------------------|
| 2, 4-D          | 3.30                             |
| Mecoprop        | 0.72                             |
| Dicamba         | 0.30                             |
| <b>Acres</b>    | <b>3.7</b>                       |

**Warner Stadium**

| <b>Chemical</b> | <b>Amount Product Used (lb)</b> |
|-----------------|---------------------------------|
| Glyphosate      | 3.57                            |
| Sulfentrazone   | 0.27                            |
| 2, 4-D          | 3.30                            |
| Mecoprop        | 0.72                            |
| Dicamba         | 0.30                            |

**Acres** 2.7

**Warner Softball**

| <b>Chemical</b> | <b>Amount Product Used (lb)</b> |
|-----------------|---------------------------------|
| Glyphosate      | 1.65                            |

**Acres** 3

**Breese Stevens Field**

| <b>Chemical</b> | <b>Amount Product Used (lb)</b> |
|-----------------|---------------------------------|
| Glyphosate      | 1.44                            |
| 2,4-D           | 5.5                             |
| Mecoprop        | 1.2                             |
| Dicamba         | 0.5                             |

**Acres** 3.5

**Bowman Field**

| <b>Chemical</b> | <b>Amount Product Used (lb)</b> |
|-----------------|---------------------------------|
| 2, 4-D          | 5.5                             |
| Mecoprop        | 1.2                             |
| Dicamba         | 0.5                             |

**Acres** 7

**Reindahl Field**

| <b>Chemical</b> | <b>Amount Product Used (lb)</b> |
|-----------------|---------------------------------|
| MCPA            | 7.23                            |
| Mecroprop       | 1.44                            |
| Dicamba         | 0.72                            |
| Prodiamine      | 2.00                            |

**Acres** 4.4

**Olbrich**

| <b>Chemical</b> | <b>Amount Product Used (lb)</b> |
|-----------------|---------------------------------|
| Glyphosate      | 0.77                            |

**Acres** 5.4

The pesticide plan for 2009 is the same for that of 2008. We will work to minimize the number of locations and amounts of pesticides applied.. Pesticides applications will be made in a safe and conscientious manner.

### ***FYRP volunteers activities in Tenney Park and Yahara Parkway***

Non-Chemical Controls - Over 95+% of the control activity consisted of pulling garlic mustard, other herbaceous exotics and exotic woody vegetation with small stems (typically less than 1/4 inch diameter) in Tenney Park, near the old boathouse site along the river and along the lower parkway near the Rutledge Street bridge.

Woody exotics removed and native wild rose plantings expanded to east bank of lower parkway by Lake Monona. Native dogwood shrub beds at Rutledge Street bridge pruned to enhance vigor.

Transient encampments continue to present a landscape restoration and management concern for FYRP volunteers in Burr Jones, old boathouse site along river and boundary of Camelot Apartments

Japanese Knotweed and incipient garlic mustard infestation noted in Filene Park. Mechanical suppression (e.g., pulling, cutting and covering) initiated. Some neighbors consider Japanese Knotweed attractive and have dug it up and replanted it to other locations near the Yahara Landing Apartments. This activity was politely discouraged.

Pesticide Use - Concentrated Round-up (~ 48% active ingredient – 16 oz a.i. glyphosate) painted on cut stumps of exotic invasive species (buckthorn and honeysuckle) in shrub beds on the north side of the island in Tenney Park. Applications conducted from mid-October to early November This is recommended period for cut stump treatments and public use is reduced. Approximate area of shrub beds 0.25 acres. One quart total (~1 pint active ingredient) was applied.

### **SUMMARY OF COMPLAINTS RECEIVED**

No complaints received. Neighborhood associations have been informed and users have appreciated the landscape restoration activities.

2009 Plan - Anticipate similar treatments in targeted areas of Tenney Park and Yahara Parkway during 2009. Emphasis on manual control with pesticide where manual/mechanical control is not practicable. Japanese knotweed control will be emphasized to prevent further spread. FYRP will continue to seek city assistance with landscape restoration activities.

### **WEST PARKS**

Pesticide applications were made at Bowman Softball (3 diamonds), Bowman Baseball (1) diamond, Elver Softball (4) diamonds, and Goodman Softball (2) diamonds, for the control of weeds along the backstops and bleachers.

6 lbs. of Quick Pro (Glyphosate) applied at 6 oz per 5 gallons.

We pulled weeds and used mulch to control growth in our planting beds.  
Plans for 2009 will be the same as 2008.

### **SUMMARY OF COMPLAINTS RECEIVED**

No complaints received.

### **CONSERVATION PARKS**

#### **EXOTIC WOODY PLANT CONTROL IN CONSERVATION PARKS**

Purpose: To reduce the presence of these species (chiefly buckthorn, honeysuckle, russian mulberry, box elder) to preserve the natural diversity of plants and animals in the conservation parks.

Cut stump treatment on target species: Spot treatments in various conservation parks.

Amount of pesticides applied: 5.39 lbs. of Glyphosate (active ingredient) of Round-UP, Tordon RTU: 1.27 lbs picloram a.i., 5.7 lbs 2,4-D a.i., Pathfinder II: .18 lbs. triclopyr a.i.

#### **EXOTIC WOODY PLANT CONTROL IN GENERAL PARK NATURAL AREAS**

Purpose: To control buckthorn, honeysuckle, Russian mulberry, box elder, and other exotic woody plants to preserve and restore native plant diversity.

Locations: Hoyt Park woods in cooperation with the Friends of Hoyt Park, Westmorland Woods, Walnut Grove low mow Meadows, Elver low mow meadows.

Amount of pesticide: Garlon 4 (Triclopyr) = 3.07 lbs. a.i., Tordon RTU (0.15lbs Picloram, 0.67 lbs 2,4-D a.i.).

#### BIRDSFOOT TREFOIL CONTROL

Purpose: To control this aggressive exotic plant while populations are small. They threaten native plant diversity if left unmanaged. This population was accidentally introduced from seed after restoration of a roadside construction project.

Location: Prairie Ridge Conservation Park (along Raymond Rd)

Amount of pesticide: Milestone (Aminopyralid) (.283 lbs a.i.) was selectively applied over approx. 0.25 acres. This herbicide is highly effective on legumes, while not impacting native grasses and mints.

#### SITE PREPARATION FOR LOW MOW MEADOWS IN GENERAL PARKLAND

Location: Olin Park Hillside

Purpose: Eliminate existing exotic perennial grasses to prepare sites for seeding prairie plants. Once established this area will require less maintenance, promote rainfall infiltration, and increase biodiversity.

Amount of pesticides applied: Sethoxydim (0.9 lbs) applied on 2 acres.

#### WETLAND MITIGATION IN CHEROKEE MARSH AS PART OF RUNWAY SAFETY IMPROVEMENTS

Location: 80 acres of City of Madison wetlands north of CTH CV, and west of Hoepker Rd. This area is part of the Cherokee Marsh State Natural Area.

Project objectives: To restore open marshland habitat and natural hydrology. Drainage ditches were dug in the 1960's, which altered hydrology and allowed trees to invade on the spoil banks.

Target species: Reed canary grass and invasive shrubs. Two miles of drainage ditches were filled with peat, which came from the adjacent railroad reconstruction project in the marsh. Reed canary grass treated with (grass specific herbicides) as part of an **ongoing adaptive restoration agreement with the airport, Army Corps of Engineers, and the Wisconsin DNR**. In 2008 the Wisconsin DNR tested 3 different herbicides to test their effectiveness. They sprayed 2.8 acres of Intensity (1.5 lbs. a.i. Clethodim); 25.4 acres of Fusilade (22 lbs. a.i. Fluazifop); 7 acres of Vantage (2.25 lbs. a.i. Sethoxydim). Fusilade appeared to be most effective.

Other control measures: On November 19, 2008 the WDNR completed a 271-acre burn on the Cherokee Marsh State Natural Area. This should help facilitate the control of reed canary grass, and woody invasives, while stimulating native plant growth.

Applicator information: Herbicides applied Wisconsin DNR Natural Areas crew under contract with Dane County Regional Airport.

#### CONTRACTOR HIRED HERBICIDE TREATMENTS TO RESTORE OAK WOODLANDS AND REMNANT PRAIRIES

Locations: Oak woodland restoration projects at Turville Point (3.5 ac.), Kettle Pond (.25 ac.), and Prairie Ridge (3 ac.). A dry prairie remnant (3.7ac.) restoration project at Prairie Ridge.

Project objectives: Restore native oak woodlands and prairie landscapes in Madison Conservation Parks.

Target species: Brush was treated as a foliar application on resprouts 4 to 6 weeks after mowing at Prairie Ridge. The goal is to use fire to keep these species under control with fire after the mechanical brush mowing and initial herbicide application. Kettle Pond, and Turville Point projects involved broadcast spraying broadleaf herbicide to prepare sites for seeding of native grasses and sedges. Those sites are highly disturbed with large infestations broad leaf weeds like garlic mustard, dame's rocket, motherwort, burdock, etc. Native forbs (broad leaves) will be introduced once exotics are under control. Broad leaf herbicides will not affect native grasses, and sedges (which will provide competition against weeds).

Amount of pesticides applied: Tahoe 4E, a.i. Triclopyr 15.87 lbs. ; Escort, a.i. Metsulfuron methyl 3.53 lbs. ; Milestone, a.i. Aminopyralid 0.2 lbs.

#### NON-CHEMICAL PEST CONTROL MEASURES

Garlic Mustard Control: This aggressive exotic biennial plant is a threat to decrease diversity in oak woodlands. Volunteers spent **700 hour's** hand pulling this species at (Edna Taylor, Turville, Owen, Sandburg, Heritage Sanctuary, Hiestand Woods, Cherokee Marsh). It is hoped that a biological control agent (insect) will be available within 5 years.

Biological control for large infestations of Leafy Spurge: Leafy spurge is an exotic perennial weed that spreads rapidly via vegetative reproduction. It is a significant threat in native and restored prairies. We have released 20,000 flea beetles as a biological control agent over the past 4 years. The larvae of this insect bore into the stems and roots of the plant causing damage, which reduces flower production, and lowers plant vigor. Observed no flowering plants at Prairie Ridge Conservation Park due to insects weakening plants. We are netting the insects and transferring them to other parks infested with leafy spurge.

Prescribed Fire: The use of fire is an important land management practice, which helps promote native species over exotics. The timing of burns can help set back exotics i.e. late spring burns harm cool season weeds, but promote native warm season plants. Burns can also cause mortality to small woody exotics like buckthorn and honeysuckle. If the timing is perfect fire can even kill first year garlic mustard seedlings. Unfortunately, the number of days suitable for burning is limited by both weather conditions and staffing levels. Ideally we should be burning 400 to 600 acres each year to optimally manage our natural areas. Currently we burn less than 200 acres annually.

Hand-pulling Buckthorn Saplings: At Kettle Pond a volunteer spent 5 hours through out the year hand-pulling this exotic woody plant. This control method is very labor intensive, and limited to times when the soil is soft enough to allow pulling.

Introducing prairie forbs into native grass dominated prairie restoration: At Owen Park we mowed an area of approximately 3 acres several times during the summer to set back the tall native grasses. This was done in lieu of using a grass specific herbicide. In late August 2,000 2-inch prairie forb plugs were planted by volunteers. Hopefully they will survive and increase native plant diversity in this prairie restoration.

Controlling red clover infestation around Owen ponds project: The seed bank of the topsoil salvaged onsite contained a large amount of red clover, which germinated prolifically. This was a threat to the prairie seeding that was installed in November 2007. The red clover was string trimmed or mowed several times during 2008 to prevent flowering and seed production. It will be necessary to mow often in 2009 as a continued control measure. We have used this cultural control elsewhere in the park with good success.

#### SUMMARY OF COMPLAINTS RECEIVED

No complaints received in 2008.

#### CONSERVATION PARKS PLAN FOR 2009

Our IPM Program will be similar to 2008. Adaptive management will continue on the airport mitigation sites, which may require some additional herbicide applications. Woody plants and reed canary grass are the target species. As budgeting allows we will continue to use mechanical brush control in lower quality woodland and wetland areas. Brush control may be followed with the planting of native grasses, forbs, shrubs, and trees as part of the restoration process.

Plan to institute a marsh-haying program for the recently acquired East Marsh property at Cherokee Marsh (approximately 200 acres of wetlands east of North Sherman Ave.) This area was historically mowed to provide animal feed for a nearby farm. The quality of this wetland has degraded in the absence of mowing over the past 20 years. Mowing will help control brush, cattails, and reed canary grass by removing nutrients through the haying operation (the biomass is removed as hay bales).

#### OLBRICH BOTANICAL GARDENS

All chemical applications are made by, or under the supervision of, licensed pesticide applicators including Wil-Kil Pest Control.

## SUMMARY OF COMPLAINTS RECEIVED

There were no complaints regarding the use of pesticides in the outdoor gardens, Bolz Conservatory or the production greenhouses.

### Pesticide Management Plan for the 2008 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 conservatory with satisfactory results. The quail will continue to be maintained in the conservatory, as they have been very effective at controlling the palmetto bug population. 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.

### Safe Handling, Application, Storage, and Disposal of Pesticides:

Safe handling: Staff using pesticides are licensed and properly trained to handling pesticides in a safe manner. All employees handling pesticides are provided proper personal protective equipment required for the safe transfer of pesticides.

### Application

Staff using pesticides is licensed and has been properly trained to apply pesticides on botanical collections. Pesticide label procedures are followed for application and re-entry periods.

### Storage and Disposal

Pesticides are stored in a marked and locked chemical storage room, complete with a vented hood and handling facilities.

### Notification Plan

Outdoor Garden areas are posted prior to treatment and 24 hours following application of pesticides. Production greenhouse areas (non-public) are posted for at least 12 hours (24 hours for Orthene) following application of pesticides. Application information for the greenhouse is posted for 30 days.

## **Eugenie Mayer Bolz Conservatory**

No Chemical Pesticides were applied to the plant collection in the 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 eradication. Several beneficial insects have been used to control the plant damaging insects. Over the years some target insect species have been all but eliminated while new pests have appeared in the collection seemingly overnight. Some of the beneficial insects that we have released into the conservatory have a broad diet of target insects while others control a single insect. The control of plant damaging insects has not been as simple as releasing large numbers of ladybeetles. Some of the "good bugs" are actually parasitized by other insects so that timing of the release of the beneficial insects is very important. In addition, specific climatic conditions of temperature and humidity are needed for a successful release. Some of the target insects in the conservatory are also "farmed" by ants that protect them from our released beneficial bugs.

5 grams (2% Disodium Octaborate tetrahydrate) Gourmet Ant Bait was used (not accessible to the public) in the Conservatory for Ant Control.

1.1 grams a.i. (0.05% wt/wt) Hydramethylnon was used in the Conservatory (not accessible to the public) as a trial for Ant Control.

Following is a list of the beneficial insects that released into the conservatory from time to time as the situation warrants. Some must be released when the population of a target insect is very low while others are only successful when there are a large number of insects for the beneficials to consume.

### **Beneficial Insect**

Amblyseius cucumeris (predator)  
Aphidoletes aphidimyza (predator)  
Aphytis melinus (parasite)

### **Target Pest**

Thrips, Mites  
Aphids  
Scale insects

|                                      |                             |
|--------------------------------------|-----------------------------|
| Atheta coriaria (predator)           | Soil insects, Thrips        |
| Chrysoperla spp. (predator)          | Several Insects             |
| Cryptolaemus montrouzieri (predator) | Mealybugs, Scales, Aphids   |
| Encarsia formosa (parasite)          | Whitefly                    |
| Metaphycus helvolus (parasite)       | Scale insects               |
| Orius spp. (predator)                | Thrips, Aphids, Mites       |
| Rhyzobiius lophanthae (predator)     | Scale insects               |
| Steinernema carpocapse (parasite)    | Gnats, Thrips, Soil insects |

Birds, specifically Quail (*Coturnix coturnix*), have been effective at controlling the nuisance palmetto bugs found in the conservatory. Assorted frogs, toads, and geckos living in the conservatory also use the palmetto bugs as a food source.

Vigorous daily washing of the plants in the conservatory has also proven to be very effective at controlling unwanted insects.

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

### **Production Greenhouses (not open to the public)**

The plant material in the Greenhouses is checked daily for insect and disease activity. The staff develops a control plan depending on the seriousness of the situation. Some plant material is washed or pruned to control the problem. Other times a treatment with oil or soap is used. Since some of production and collection material has a threshold of zero tolerance we must resort to stronger Chemicals. We try to use the least toxic material available that will give adequate control.

Chemical names & amounts of active ingredients used

0.03 lbs of a.i. (15% thiophanate-methyl) -Banrot - was applied for disease control. (*Danger*)

0.0001 lbs of a.i. (50% trifloxystrobin) Compass - for disease control. (*Caution*)

0.104 lbs of a.i. (1 lb of spinosad per gallon) Conserve - was applied for insect control. (*Caution*)

0.06 lbs. of a.i. (1 lb chlormoquat per gallon) Cycocel - was applied for plant growth control. (*Caution*)

0.062 lbs. of a.i. (pymetrozine 50%) Endeavor was applied for insect control. (*Caution*)

<0.0001 lbs of a.i. (4 lbs spiromesifin per gallon) Judo- was applied for mite control. (*Caution*)

0.11 lbs. of a.i. (1% imidacloprid) Marathon –was applied for insect control. (*Caution*)

0.022 lbs of a.i. (2 lbs imidacloprid per gallon) Marathon II –was applied for insect control. (*Caution*)

0.30 lbs. of a.i. (97% acephate) Orthene - was applied for insect control. (*Caution*)

0.05 lbs of a.i. (1 lb clotentazine per 32 fl oz) Ovation - was applied for insect control. (*Caution*)

0.002 lbs. of a.i. (2 lbs chlorferapyr per 1 gallon) Pylon - was applied for mite control. (*Caution*)

0.005 lbs of a.i. (1% Iron Phosphate) Sluggo - was applied for slug control. (*Caution*)

0.01 lbs. of a.i. ( 2 lbs of metalaxyl per gallon) Subdue -was applied for diseas control. (*Warning*)

1.46 lbs. of a.i. (98.8% paraffinic oil) Sunspray Ultra-Fine Oil –was applied for insect control.

0.14 lbs. of a.i. (75% pentachloronitrobenzene) Terraclor - was applied for disease control. (*Caution*)

<.0002lbs. of a.i. (0.8% bacillus thuringiensis) Thuricide –was applied for insect control. (*Caution*)

### **Olbrich Botanical Gardens Rodent Control**

Rodent control is applied only in areas where there is a specific problem. This may include many sites throughout the facility. The blocks are contained in bait stations which are concealed and tamper proof and are not accessible to the public. Some of the Stations are used within the Conservatory. A commercial pest control company routinely checks the stations.

46 blocks (0.005% bromadiolone) WeatherBlok XT - was applied to various sites in the facility for the control of rodents.

22 blocks (0.005% bromadiolone) Contrac All-Weather Blox –was applied to various sites in the building for rodent control.

11 blocks (0.0025% Difenthialone) Generation Mini-Blocks –was applied to various sites in the building for rodent control.

### **Outdoor Gardens Summary**

In 2008 Olbrich Botanical Gardens was happy to report continuing success in decreasing the variety and amounts of chemical pesticides used in the outdoor gardens. As always, we strive to apply the principles of Integrated Pest Management (IPM) to our gardening practices here. IPM stresses evaluating a wide range of criteria when deciding when and what treatments are necessary for dealing with garden pests, and choosing solutions that minimize the amount and types of products used to combat them. Below is a listing of some of the strategies we employ that fall under the guidelines of our IPM program.

Select disease resistant varieties. One good example would be our collection of ornamental crab apples. Notoriously prone to fungal diseases such as rust and apple scab, we select and plant varieties that are naturally resistant to these, minimizing, and in most cases eliminating, the need for spraying. Our new Rose Garden, while still showcasing a wide variety of roses, emphasizes the Shrub and Landscape roses that require little or no spraying.

Assess damage thresholds. We are willing to live with certain levels of damage, both aesthetic and physical. For instance, minor cases of powdery mildew on ornamental plants, while easily cured by common fungicides, are usually ignored. The same would hold true for many of the minor insect problems that we witness. We tend to spray only if the health of the plant is compromised or the visual attraction of the plant is greatly affected, and then start with less toxic solutions rather than immediately reaching for a stronger 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. This would also fall into the category of:

Manual/Cultural controls. While we do use Round-Up and related products, as well as small amounts of other herbicides, the great majority of weed control in the gardens is done by manually pulling them and preventing them in the first place by liberal and frequent applications of leaf and wood mulches. Obviously, our large corps of volunteers helps make this possible.

Choose less toxic pesticides. When possible, we use products such as insecticidal soaps and horticultural oils, both very effective against many insect pests but generally safe for the environment. When we do need chemical alternatives, we look for products with lower toxicities. An example would be Banner-Maxx, the fungicide we use on our hybrid rose collection, which is much safer than many older products while also giving longer control, minimizing the total amounts used over a season. We also like to use products such as Compass, a fungicide, and Avid, a miticide that contains synthetic versions of naturally occurring compounds. 2008 saw us continuing to experiment with repellents such as Hinder to deter rabbits, after earlier trials with hot pepper sprays and Liquid Fence met with limited success. We will continue efforts in this area.

Let Nature help. By keeping our gardens healthy, we help create environments where the natural balances between predator and prey help keep our plant collections protected. Birds and beneficial insects help us keep the bad insects in check and resident foxes and red-tail hawks have helped our rodent and rabbit problems tremendously. In addition, we live-trap and relocate rabbits when their population reaches damaging levels. In 2008, we continued an effort to control rose midge, a pest that destroys the blooms of roses, with the application of several timed releases of predatory nematodes, microscopic worms that attack the midge in its larval stage. After several years of limited success, we had very good control this year so we will continue to explore this option, while

using least toxic, while still effective, conventional pesticides as our “firewall”. In the fall of 2008, we treated large areas of our turf with milky spore bacteria, a naturally occurring organism, to help control Japanese Beetles, one of our worst garden insect pests.

Chemical names & amounts of active ingredients used

0.62 lbs. of a.i. (1.3 lbs of propiconazole per gallon) Banner Maxx –applied in the outdoor gardens for disease control. (*Warning*)

0.03 lbs of a.i. (15% thiophanate-methyl) Banrot - was applied for disease control (*Danger*)

0.0001 lbs of a.i. (50% trifloxystrobin) Compass - was applied for disease control. (*Caution*)

0.009 lbs. of a.i. (2.25 lbs per gallon of triclopyr) and 0.003 lbs. of a.i. (0.75 lbs per gallon of clopyraid) Confront – was applied for weed control. (*Danger*)

0.31 lbs. of a.i. (0.91 lbs of elemental copper per gallon) Cutrine Plus –was applied for algae control. (*Danger*)

0.016 lbs. of a.i. (20% cyfluthrin) Decathlon –was applied for insect control. (*Caution*)

0.004 lbs. of a.i. (75% quinclorac) Drive 75 –was applied for weed control. (*Caution*)

3.88 lbs. of a.i. ( 4 lbs of glyphosate per gallon) Glyphosate Pro –was applied for weed control. (*Caution*)

0.78 lbs of a.i. potassium salts of fatty acids Insecticidal Soap –was applied in the outdoor gardens for insect control. (*Warning*)

0.007 lbs of a.i. mancozeb and 0.022 lbs of a.i. copper hydroxide (15% mancozeb and 46.1% copper hydroxide) Junction –was applied for bacterial/fungal diseases. (*Danger*)

0.0015 lbs a.i. halosulfuron-methyl (75% halosulfuron) Manage –was applied for weed control. (*Caution*)

0.001 lbs of a.i. (2 lbs imidacloprid per gallon) Marathon II –was applied for insect control.(*Caution*)

0.125 lbs of a.i. imidacloprid (.5% imidicloprid) Merit .5G –was applied for insect control. (*Caution*)

0.30 lbs. of a.i. (97% acephate) Orthene - was applied for insect control.(*Caution*)

0.04 lbs. of a.i. ethephon (0.33 lbs per gal) Pistil - was applied as a growth regulator. (*Caution*)

8.76 lbs of a.i. (73.3% glyphosate) and .35 lbs of a.i. (2.9% diquat dibromide) Quick-Pro –was applied for weed control. (*Caution*)

0.022 lbs of a.i. diquat (3.73 lbs per gal diquat) Reward –was applied for weed control. (*Warning*)

1.46 lbs. of a.i. (98.8% paraffinic oil) Sunspray Ultra-Fine Oil –was applied for insect control. (*Caution*)

0.85 lbs of a.i. sethoxydim (1 lb sethoxydim per gal) Sethoxydim –was applied for weed control.(*Caution*)

0.018 lbs of a.i. carfentrazone (.05 lbs per gal), 0.85 lbs of a.i. 2,4-D (1.53 lbs per gal), .05 lbs of a.i. dicamba (.14 lbs per gal), .17 lbs of a.i. MCPP (.48 lbs per gal) Speedzone –was applied for weed control. (*Caution*)

0.037 lbs of a.i. (7.9% bifenthrin) Talstar - was applied for insect control. (*Caution*)

<.0002lbs. of a.i. (0.8% bacillus thuringiensis) Thuricide –was applied for insect control.(*Caution*)

0.27 lbs of a.i. methanearsenate (1.8 lbs per gal), 0.09 lbs of a.i. 2,4-D (.48 lbs per gal), 0.04 lbs of a.i. MCPP (.24 lbs per gal), 0.02 lbs of a.i. dicamba (.12 lbs per gal) Trimec Plus –was applied for weed control. (*warning*)

## **FORESTRY**

### Application summary:

Gypsy Moth – On May 22, 1,411 acres were treated by aerial application in 12 spray block across Madison to suppress the Gypsy Moth infestation. The areas were treated with Foray 48B at a rate of 0.75 gallons per acre. 1058.25 gallons of Foray were used. The active ingredient of Foray is *Bacillus thuringiensis var. kurstaki* (Btk) – 2.1%.

## **SUMMARY OF COMPLAINTS RECEIVED**

Eight property owners objected to the aerial application of Btk . A buffer zone of at least 250 ft was excluded from the spray program around the property for each of the objectors.

### 2009 Pest Management Plan

The City of Madison has requested that the DNR spray (Btk) 1,825.69 acres in 2009 on 27 spray blocks ranging from 20 acres to 337 acres.

Individual egg mass oil application – Because of extremely high populations of Gypsy moth in Olin Turville Park, City Forestry will treat egg masses on individual trees with Golden Pest Oil (93% soybean oil) in addition to the aerial application. Other Park areas may also be treated as time and staff allow.

## **GOODMAN MAINTENANCE FACILITY**

No Applications were made in 2008

## **BEACHES**

City beaches are not chemically treated to control lake weeds. Weeds are controlled by manual cutting and removal. Approximately 200 cubic yards of lake weeds were removed from our beaches and boat landings. In concessions, mechanical traps are used for rodent control. Staff stores all food items in pest proof containers and inspects all food deliveries. Keeping buildings clean and eliminating pest entrance points aides in the control of pests.

Beach sand is raked daily to expose waterfowl droppings during the summer. Signs are also posted asking patrons not to feed waterfowl. The decision to close beaches and the actual posting is done by the Health Department.

No pesticide applications were made in 2008.

## **FOREST HILL CEMETERY**

Forest Hill Cemetery chemical control for pests is limited to the mausoleum. Terminix has been contracted to help control a phorid fly infestation. These flies are a chronic problem, typically worse during the warm season, and are endemic to mausoleums in general. Terminix employed the use of 2 timed misters and did one general fogging during the 2008 season. The product, amount and concentrations used are as follows:

Product: Demand CS

Active Ing: Lambda-cyhalothrin 240 oz. x .015% = .036 oz.

Product: Purge III

Active Ing: Pyrethrins 32 oz. x 1% = .32 oz.

90 oz. x .975% = .877 oz.

Piperonyl Butoxide 90 oz. x 1.95% = 1.76 oz.

N-Octyl bicycloheptene dicarboximide 90 oz. x 3.05% = 2.74 oz.

Forest Hill uses a variety of non-chemical measures to control or manage cemetery grounds as an alternative to chemicals. These mechanical and cultural control practices include, but are not limited to the following:

Increased mowing frequency of our approximately 73 acres as the weeds, such as dandelions, proliferate. String trimming around the thousands of headstones and trees. Hand removal of volunteer trees, suckers and weeds that grow between markers and in flower/shrub beds. Increased watering and labor intensive care to establish acceptable turf without the use of chemical fertilizers. Mechanical trapping of rodents in the cemetery office.

#### SUMMARY OF COMPLAINTS RECEIVED

We do receive complaints from family members and lot owners that have paid specifically for perpetual care in the lot buying process. Typically, these complaints involve problems with weeds growing in turf and around markers and also with long grass/weeds growing around markers as we are unable to keep up with trimming schedules. We also receive complaints from visitors to the mausoleum regarding the nuisance of live phorid flies and of the dead flies on shelving and flooring.

Forest Hill Cemetery does not anticipate any change in the use of pesticides in 2009. We also expect to continue the non-chemical means of pest management currently employed.

#### CITY OF MADISON GOLF COURSES

The four golf courses are laid out on 960 acres of property. Of this 960 acres, 14.5 acres are putting greens, 23.5 acres are tees, 147 acres are fairways and the remaining 775 acres are composed of roughs and natural areas. In 2004, all four City golf courses achieved Audubon Certification for the completion of their Environmental Planning and Site Evaluation. Ecological improvements included the success and expansion of our Bluebird nesting boxes. We also saw the installation of turtle nesting beds and bat houses on the Odana Hills Golf Course. Buildings that were heated through the winter months are now being winterized and the heat turned off.

A major environmental improvement project was completed 2007 in cooperation of MG&E and the State of Wisconsin. Odana Hills is the site for an experimental groundwater recharge project. This project takes storm water, filters the water, and is pumped below ground to replenish the groundwater. This is a benefit to both the groundwater and to Lake Wingra. This helps control the water that flows through the Odana Hills Golf Course, reducing pollutants and erosion into Lake Wingra. Through this project and the extensive testing of the pond water, it was good to learn that no golf course pesticides have been detected in the samples. With careful use, protecting surface waters can be achieved.

Pesticide use on golf courses is essential because turf conditions affect play. Tolerance levels of weeds and turf diseases are low because they would have an adverse effect on the play. A wide variety of fertilizers, herbicides, insecticides and fungicides are used to maintain turf conditions acceptable for golf. Algae control is also necessary in ponds which are used for irrigation to prevent clogging of pumps, valves and filters. (A complete report of pesticide use is attached.)

All golf courses have a high level of non-pesticide turf maintenance. A variety of cultural, biological and mechanical practices helps reduce disease activity and are environmentally friendly. We also monitor for active diseases. Weather conditions play a major role in our program. Not only do they have an affect on the disease levels, but also dictate when an application can be made safely to minimize drift. Weather also affects the amount of stress to turf and its disease tolerance levels. As you can see, treatment considerations must be made by monitoring the environment, threshold levels, cultural options, pesticide options, length of control and the amount of control desired. Greens are the heart of any golf course and City greens are maintained to the same standards as private courses. Semi-preventive treatments for fungi are applied on a schedule that considers all of the factors mentioned above.

#### SUMMARY OF COMPLAINTS RECEIVED

We did not receive any complaints regarding pesticide applications in 2008. Odana Hills experienced turf loss due to high populations of turf feeding insects. Damage was mainly a result of wildlife destroying the turf to get at the root-feeding insects.

The program in 2009 will be the continuation of the current IPM policy. We are also going to be using new products that either reduce application rates or offer safer packaging when mixing and loading. Insect damage continues to increase with turf loss becoming a major concern. Japanese Beetle populations caused turf loss at all four courses and we will continue to work closely with the U.W. on our monitoring and treatment options. The heavy infestation of Japanese Beetles require that we prepare for preventative treatments in 2009. Without preventative action, more toxic and larger dosages of a pesticide would be required to control the established pests.

The golf program will continue to seek out "Least Risk" pesticides along with the new technology that permits lower application rates and safer alternatives.

To simplify the reporting standards, all amounts listed are in lbs. of active ingredients applied no matter if it was applied in a liquid or a granular form. Also the active ingredient is now being identified by the common chemical name.

Non-Chemical Control Measures

- Hand weeding of flower and planting beds.
- Increased area of low maintenance turf.
- Used recycled tires as a mulch in flower beds.
- Use of heavy mulch around trees to reduce string trimming and possible tree damage.
- Irrigating greens early in the morning to reduce time excess moisture is on the surface.
- Mowing greens early in the morning to remove dew and moisture.
- Using a wetting agent to improve moisture penetration into the soil.
- Keeping mowers sharp to reduce plant damage for a healthier plant.
- Frequent topdressing to reduce thatch and encourage biological activity.
- Changed equipment to biodegradable lubricants when possible.
- Changed vents on fueling tanks for reduced vaporization and employee safety.
- Use of a dew whip on fairways and tees.
- Aerification of turf
- Verticutting greens to increase putting speeds without lowering mowing height.
- Syringing and hand water to cool greens and prevent turf loss.
- Increased mowing frequency to control dandelion flower production.
- Light and frequent fertilization to promote plant health and reduce disease pressure.
- Annual soil tests for accurate planning and implementation of fertilizer programs.
- Trim trees to improve sunlight exposure and increase air movement.
- Overseeded some greens with a new disease resistant variety of grass.

Pesticide Applications 2008

No private contractor applications were made in 2008.

All staff using or directing the use of pesticides have been properly trained in IPM, Storage, Handling, Application and Disposal of pesticides. They are certified by the State of Wisconsin in the category of Turf and Ornamentals with some individuals also having Aquatic Certification.

**Golf Course Pesticide Use Report - Lbs.**

Area Location Key 1-Greens, 2-Tees, 3-Fairways, 4-Roughs and Misc Areas and 5-Ponds

|                                     | <b>Areas</b> | <b>2007</b> | <b>2008</b> |
|-------------------------------------|--------------|-------------|-------------|
| Chlorathalonil (Fungicide)          | 1,2,3        | 359.18      | 619.5       |
| Glyphosate (Herbicide)              | 4            | 14.2        | 22.5        |
| Dicamba (Herbicide)                 | 3,4          | 0           | 8.23        |
| 2,4-D ( Herbicide)                  | 3,4          | 0           | 29.05       |
| Dichlorprop (Herbicide)             | 3,4          | .64         | 0           |
| PCNB (Fungicide)                    | 1,2          | 13.86       | 0           |
| Iprodione (Fungicide)               | 1,2          | 115         | 180         |
| Chloroneb (Fungicide)               | 1,2          | 59.09       | 122.68      |
| Thiophanate methyl (Fungicide)      | 1,2          | 0           | 13.95       |
| Bentashiornitrobenzene (Fungicide)  | 1            | 23.6        | 0           |
| Myclobutanil (Fungicide)            | 1,2          | 5.12        | 4.41        |
| Indoxacarb (Insecticide)            | 1            | .76         | 0           |
| Imidacloprid (Insecticide)          | 3            | 5.83        | 24.4        |
| Trinexapac-ethyl (Growth Retardent) | 1            | 3.55        | 9.26        |
| Thiamethoxam (Insecticide)          | 1            | 0           | 20          |
| Fluxostrobin (Insecticide)          | 2            | 0           | 11.75       |
| Boscalid (Fungicide)                | 1            | 11.37       | 12.33       |

|                               |       |       |        |
|-------------------------------|-------|-------|--------|
| Climethoxybenzene (Fungicide) | 1,2   | 18.82 | 0      |
| Pyraclostrobin (Fungicide)    | 1     | 1.6   | 0      |
| Propiconazole (Fungicide)     | 1     | 74.65 | 66.74  |
| Ethephon (Growth Retardent)   | 1     | 45    | 72.5   |
| Fluroxypyr(Herbicide)         | 4     | .32   | 0      |
| Vinclozolin ( Fungicide)      | 1,2,3 | 57.75 | 249.25 |
| Triadimefon (Fungicide)       | 1     | 25.51 | 3.12   |
| Mefenoxam (Fungicide)         | 1     | 6.6   | 14     |
| Trifloxystrobin (Fungicide)   | 1     | 3.91  | .72    |
| Mancozeb (Fungicide)          | 1     | 26.1  | 0      |
| CuOH2 (Algaecide)             | 1     | 69.13 | .35    |
| Fludioxonil (Fungicide)       | 1     | 0     | .75    |
| Indoxacarb (Insecticide)      | 3     | 0     | 1      |
| Clorophenoxy (Fungicide)      | 1     | 1.1   | 2.76   |

**WARNER PARK COMMUNITY RECREATION CENTER**

WPCRC thanks it's numerous landscape volunteers for their 400+ hours of landscape service utilizing non-pesticide control methods.

In 2008, the WPCRC used a product called Ground Force, an organic herbicide for weed control in the cracks of our sidewalks. Ground Force contains 10% citric acid, .2% garlic extract, vinegar and yucca extract.

No pesticide applications were made in 2008.

**MALL/COUNCOURSE MAINTENANCE**

The Mall/Concourse staff has taken several steps to reduce unwanted plant growth in our area.

- Seasonal adjustment of mowing height to promote healthy turf
- Irrigate turf to promote healthy plants
- Use of torch/weed burner to eliminate unwanted plant growth
- Hand pulling weeds in unwanted areas

No pesticides were used in 2008