University of Calgary

PP, 2500 University Drive NW Calgary Alberta

Facility Management

Integrated Pest Management Plan

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UNIVERSITY OF CALGARY

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1.0 Integrated Pest Management Background

Integrated Pest Management (IPM) is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment. IPM involves a series of pest management evaluations, decisions and controls. IPM is a decision-making process that emphasizes prevention, knowledge of pest biology, and the use of least-disruptive control tactics, with pesticides saved as a last resort. While IPM has become standard practice in agriculture, it has been slower to take hold for structural pest management. Successful pest management on the farm can be measured easily at harvest time through crop yields and quality, but this is not the case in the city. Here success is more subjective, even psychological.

Homeowners may feel successful if they see dead ants on the floor, not knowing that their spray can has made no impact on the health of the ant colony. Still farther from their thoughts are the forgotten food scraps beneath the refrigerator that attracted the ants in the first place, or the scale insects living on the fruit tree just outside, whose sugary droppings help boost the colony's population.

A restaurant owner facing a rat infestation wants the evidence destroyed before the next health department inspection. However, they may not consider sealing the gap in the door frame that let the animals enter in the first place, or putting a better lid on the dumpster out back, or removing the English ivy patch in the backyard (a preferred rat habitat). The result of our short-sighted approaches to this somewhat repulsive topic is that pests are managed neither safely, nor effectively, nor economically. Too often we ignore the most important, logical and environmentally sound step — *prevention*.

2.0 The Problem

Prevention of pest problems is the heart of any state-of-the art integrated pest management programs, and the subject of this plan. Pest proofing in conjunction with sanitation efforts provides the best long-term management of urban pest infestations. Relatively simple design features can substantially reduce long-term pest control costs in buildings and landscapes, while also cutting the health and environmental impacts of pesticide use.

A pest is defined in the Federal Pest Control Products Act as "an animal, a plant or other organism that is injurious, noxious or troublesome, whether directly or indirectly, and an injurious, noxious or troublesome condition or organic function of an animal, a plant or other organism".

The definition is also related to the situation or size of the pest population that adversely interferes with the aesthetic, health, environmental, functional, or economic goals of humans. The federal definition essentially states that a pest is any organism that poses a threat to our resources, human health, and/or exists in an undesirable location.

The Provincial Weed Control Act and Agricultural Pest Act contain regulations that identify various plants as weeds and animals as pests, respectively. These lists are by no means comprehensive, particularly in relation to introduced species that have negatively impacted our natural environment parks (e.g. Caragana spp.) or introduced mammals that continue to out-compete native species (e.g.Grey squirrel).

An opportunity exists to provide definitive design guidelines for pest prevention, to incorporate these guidelines into existing design frameworks, and in the end to reduce long-term costs and pesticide use in the built environment. Thus the goal for this plan: *To create a set of authoritative and best practices in prevention and treatment of pests throughout University of Calgary campuses*.

3.0 Purpose

Structural and landscape pests can pose hazards to people, property, and the environment. Pesticides which may be required to treat the problem are, by design, often toxic and pose a potential risk of their own. This Integrated Pest Management Program is designed to minimize potential hazards related to pest management while creating and enabling world–class research, learning and service environments.

4.0 Program

To incorporate IPM procedures in order to control structural and landscape pests in a safe, efficient and effective manner within the buildings and on the grounds of the University of Calgary.

Set Action Thresholds - Before taking any pest control action, IPM first sets an action threshold, a point at which pest populations or environmental conditions indicate that pest control action must be taken. Sighting a single pest does not always mean control is needed. The level at which pests will become an economic threat is critical to guide future pest control decisions.

Monitor and Identify Pests - Not all insects, weeds, and other living organisms require control. Many organisms are innocuous, and some are even beneficial. IPM programs work to monitor for pests and identify them accurately, so that appropriate control decisions can be made in conjunction with action thresholds.

This monitoring and identification removes the possibility that pesticides will be used when they are not really needed or that the wrong kind of pesticide will be used.

Prevention - As a first line of pest control, IPM programs work to manage the crop, lawn, or indoor space to prevent pests from becoming a threat. In lawn maintenance, this may mean using methods such as selecting types of sod and grass seed that are more pest-resistant varieties. These control methods can be very effective and cost-efficient and present little to no risk to people or the environment.

Control - Once monitoring, identification, and action thresholds indicate that pest control is required, and preventive methods are no longer effective or available, IPM programs then evaluate the proper control method both for effectiveness and risk. Effective, less risky pest controls are chosen first, including highly targeted chemicals, such as pheromones to disrupt pest mating, or mechanical control, such as trapping or weeding. If further monitoring, identifications and action thresholds indicate that less risky controls are not working, then additional pest control methods would be employed, such as targeted spraying of pesticides. Broadcast spraying of non-specific pesticides is a last resort.

5.0 Procedures

- When a pest problem is encountered, the reporting departmental or faculty designate is to contact the Facilities Management (FM) using the ARCHIBUS work request protocol outlined on our web site:

  (http://www.ucalgary.ca/fmd/management/customer_care_centre).

- The FM designate will immediately contact the pest control representative to report the specific problem and the details that have been provided. The representative has been instructed to respond only when notified of a problem by the FM designate.

- The pest control representative will contact the department/faculty contact person to verify the pest problem and to arrange for a suitable time to service the affected area.

- The pest control representative will visit the site at the earliest pre-arranged opportunity.

- The pest control representative will notify the FM designate advising of any need for pesticide use, indicating the precise location and timing of the treatment.

- A FM designate will notify area occupants if service of the performed work will interrupt routine operations during treatment.
- When ready to apply a pesticide treatment, the pest control representative will notify the FM designate who will provide notice to the directly affected occupants where the pests are located.
- Once the pesticide application is complete, the pest control representative will note the details of the visit on the service report which is reported on a monthly basis to a FM designate.
- As appropriate, the pest control representative will notify the FM designate of any measures recommended to be taken by university staff in order to decrease the likelihood of a pest problem (for e.g. the need to shampoo carpets in a given area in order to discourage a problem with fleas). FM will in turn inform the zone facility manager or designate at the earliest opportunity.
- Copies of all application notice and field reports will be filed in the Operations and Maintenance Department by the FM designate. The pest control representative will supply a monthly report of pesticide utilization at The University of Calgary. The report will include the number of applications, the product name and quantity of each pesticide used. The report will be filed with the Operations & Maintenance Department of Facilities Management.

6.0 Philosophy:

6.1 Pests

Pests are populations of living organisms (i.e., insects, rodents, bacteria and weeds) that interfere with the human purposes for an area. Strategies for managing pest populations will be guided by the species of pest and the threat they pose to people, property and the environment.

Pests will be managed to:

- reduce any potential human health hazard or to protect against a significant threat to public safety
- prevent loss or damage to university structures or property
- prevent pests from spreading in the community or to plant and animal populations beyond the campus
- enhance the quality of life for university building occupants

6.2 Integrated Pest Management (IPM)

IPM procedures will determine when to control pests and whether to use mechanical, physical, chemical, cultural, or biological means. IPM practitioners depend on current, comprehensive information on the pest and its environment and the best pest control methods. Applying IPM principles discourages unacceptable levels of pest activity and damage by the most economical means and with the least possible hazard to people, property and the environment.

The choice of whether or not to use a pesticide and, if so, which pesticide to use, will be based on a review of all other available options and a determination that these options alone are either not acceptable or feasible. Selected non-chemical pest management methods will be implemented appropriately. The full range of alternative pest control measures, including no action, will be considered. When it is determined that a pesticide must be used to meet important management goals, the least hazardous material will be chosen. The application of such pesticides is subject to regulation by federal and provincial legislation in the form of the Pest Control Products Act and the Alberta Environment Act, respectively.

7.0 Grounds IPM

Trees - No pesticides are used on University of Calgary trees. Bugs are removed by hand. Trees are spray washed with water for pest management.

Weeds - Nuisance weeds are dug up and weed whipped for management. Noxious / Restricted weeds may require pesticide management which is spot applied and city mandated.

Fertilizer - Fertilizer is essential and applied sparingly, only once or twice a year. Alfalfa fertilizer has been beta tested & found to be cost prohibitive, requiring frequent application. Use of Evergro 23-3-23 during spring and fall are applied to maintain the campus appearance and to endure the foot traffic the grass receives.

Playing Fields - Playing Fields or Sports Fields receive additional care to ensure the quality of field required for safe usage. This may require the use of pesticides which are spot applied as sparingly as possible. Rubber crumb is applied to reduce the compaction of heavy use locations and promote healthy field growth.

SCHEDULE A
REQUIREMENTS/SPECIFICATIONS

University of Calgary
Pest Control Service Requirements

1) Comprehensive Preventative Maintenance Program
    - Monthly Site visit and detailed inspection
    - Re-bait stations
    - Clean, replace or re-set traps
    - Monthly report
        - Pest group
        - Structural conditions
        - Sanitation conditions
        - Corrective action taken, treatment used
        - Recommended course of action
        - Treatment area, building and room number or area description
        - Treatment date
        - Total quantity of active ingredient applied

2) Quarterly Quality Assurance & continuous improvement meetings.
    - Quarterly meeting to be coordinated and attended by designated representatives of the University of Calgary and Pest Control Services Provider.
    - Each meeting will be scheduled to review and discuss the conduct, performance, and recommendations, related to the Pest Control Services Agreement.
    - Pest Control Service Provider will be responsible for the delivery of above stated reports in addition to any mutually agreed upon deliverables stated in meeting minutes.
    - These meeting may be performed electronically via telephone and/or e-mail correspondence if agreeable to both parties.

3) Environmental Health & Safety training and compliance.
    - Parties shall observe and comply with, and shall ensure that all of its employees, subcontractors and any other persons for which it is responsible observe and comply with, the relevant safety regulations including the provisions of the current *Occupational Health & Safety Act* and all

amendments thereto, and the work practices, standards and procedures of the University that are applicable to the place where the Work is performed.

- Parties shall observe and comply with, and shall ensure that all of its employees, subcontractors and any other persons for which it is responsible are:

  (i) dressed in an appropriate manner consistent with the nature of the work being undertaken by the employee and the best standards that exist for that type of work;

  (ii) refrain from smoking in other than designated smoking areas; and

  (iii) that they do not use any inappropriate or foul language while engaged in the Work in accordance with "Acceptable Behaviour Standards".

- Pest Control Service Provider agrees that it will remove from the University any employee or subcontractor performing any part of the Work at the University if that employee or subcontractor fails to act in accordance with the Acceptable Behaviour Standards, provided that the employee or subcontractor has been warned on no less than two prior occasions that the employee or subcontractor is not acting in accordance with the Acceptable Behaviour Standards.

- Pest Control Service Provider agrees that it shall immediately remove from the Work and the University property any employee or subcontractor found to be under the influence of alcohol and/or drugs and that it shall not re-employ that employee or subcontractor in the performance of the Work or any other specific project being undertaken by the Contractor at the University.

- Pest Control Service Provider agrees that it shall have any employee or subcontractor scheduled to perform work at The University of Calgary participate in the University Orientation by Environmental Health & Safety, Campus Security, and Campus Infrastructure. Registration available on line at http://www.ucalgary.ca/safety/casp_course.

- Pest Control Service Provider acknowledges that it is an employer as defined in the *Occupational Health and Safety Act*, and the *Employment Standards Code* and it shall at all times comply with that legislation and any applicable regulations. Pest Control Service Provider. Employees or agents shall not be considered employees or agents of The University of Calgary.

4) Compliance with LEED standards
    - Pest Control Service Provider shall focus practices and recommendations on exclusion, elimination of pest harborage within a facility and elimination of food and water sources.
    - Pest Control Service Provider shall place an emphasis on the utilization of non-chemical monitoring and control tools.
    - Pest Control Service Provider shall manage infestations with industry acceptable techniques such as local treatment, and low environmental impact formulations.
    - Pesticides will be carefully selected and applied in accordance with Federal, Provincial and Local regulations. The vendor's technician will follow the directions on the product label.

5) Event & Condition assessment Reporting
    - Pest Control Service Provider agrees to provide a copy of field reports as a result of demand events. Field reports to include, requestor, work request number, date, time, duration, technician, work performed, material supplied, condition improvement recommendations.
    - Pest Control Service Provider. agrees to provide a condition assessment report at each quarterly performance & continuous improvement meeting

6) Key Performance Indicators
    a. Number of demand request - Month, Year to date, previous year.
    b. Feeding & traffic trending
    c. Response time – demand events, safety hazards, emergency requirements
        i. Priority 1 – emergency – Start Immediately 2 hour target response time.
        ii. Priority 2 – high – Begin work within 48 hours.
        iii. Priority 3 – Planned demand maintenance / project work.

Glossary:

These terms have been collected from a number of sources and those sources have been identified where possible at the end of each definition.

Abiotic - Not living

Agricultural Pest Act - An Alberta provincial act that contains the legal frame work to address nuisance and pest organisms.

Biotic – living

Biological Control - The use of living organisms (parasites, predators, pathogens) to reduce or maintain pest populations to acceptable levels.

Chemical Control - The use of a control product such as a pesticide to suppress or control a pest.

Chronic - long term

Control Product - Any product, device, organism, substance or thing that is manufactured, represented, sold or used as a means for directly or indirectly controlling, preventing, destroying, mitigating, attracting, or repelling any pest.

Cultural Practices - Management practices that focus on the prevention of pest by maintaining healthy hosts through proper planting, pruning, mulching, and sanitation practices (also referred to as Plant Health Care (PHC)

Diversity - The variety of species, vegetation communities, habitats or landform in a given area.

Ecology - The study of relationships between living things, with each other and with environments.

Ecological Approach - A systems approach to prevention and management where control strategies are determined based on the relationship between the target's organisms life cycle and its environment.

Ecosystem - A community of organisms and their physical environment.

Education - The knowledge and development arising from training.

Environmentally Sound Methods - IPM strategies and prescriptions that provide a desired result at reducing the impact of pest populations. These strategies are chosen based on the selection criteria to ensure minimal impact on the general environment and non-target organisms.

Environmental Protection and Enhancement Act (EPEA) - The purpose of the Act is to support an promote the protection, enhancement and wise use of the environment. The Act also recognizes the need for protection of the environment is essential to the integrity of ecosystems and human health and to the well-being of Society. The Act also provides legal framework for various environmental issues including the use of pesticides within Alberta (AR 126/93 and 127/93).

Evaluation - Involves analysis of treatment strategies and prescriptions to help determine the effectiveness of the control program. These records are useful in developing future pest management plans.

Fungicide - A chemical substance or cultured biological organism used to kill or suppress or prevent the development of fungi.

Genetic Control - Management practices that focus on the prevention of pests by selecting plant material that has desirable genetic predisposing features such as resistance to pests, suitable for the environmental conditions of the site, suited to the hardiness zone and geographic location, and features that are ideal for their intended use.

Insecticide - A chemical substance or cultured biological organism used to kill or suppress the growth of insects.

Integrated Pest Management (IPM) - Integrated Pest Management is an ecological approach to suppressing pest populations (i.e. weeds, insects, diseases, etc) in which all necessary techniques are consolidated in a unified program, so that pests are kept at acceptable levels in effective, economical, and environmentally sound methods. Since pest problems are often symptomatic of ecological imbalances, the goal is to attempt to plan and manage ecosystems to prevent organisms from becoming pests.

Key Performance Indicators (KPI's) - refers to quantifiable indicators of critical success factors to achieve defined institutional goals. Monitoring of KPI's over time provides a measure of progress towards organization goals.

Material Safety Data Sheet (MSDS) - A listing of chemical, technical, and hazard information for the specific product it names. It states health hazards of product use and a list of all hazardous ingredients (unless a specific exemption has been granted). The sheet details safe handling and usage procedures for all applications.

Monitoring - Involves the regular surveying of sites and/or features to understand and identify the location and extent of potential pest management problems.

Pest - Any injurious, noxious or troublesome insect, fungus, bacterial organism, virus, weed, rodent or other plant or animal pest, and includes any injurious, noxious or troublesome organic function of a plant or animal. Where by the situation or size of its population adversely interferes with the aesthetic, health, environmental, functional, or economic goals of humans.

Pesticide - A substance that is intended, sold or represented for use in preventing, destroying, repelling or mitigating any insect, nematode, rodent, predatory animal, parasite, bacteria, fungus, weed or other form of plant or animal life or virus, except a virus, parasite, and bacteria in living people or animals. A substance that is a pest control product within the meaning of the Pest Control Products Act (Canada) and is granted federal registration by Pest Management Regulatory Agency, Health Canada. e.g. herbicides, insecticides, fungicides, rodenticides, and miticides.

Pest Control Products Act (Canada) - A Federal Act administered by Health Canada. The Act and regulations cover the following areas: registration, labeling, classification, import/export control, storage, packaging, advertising, display, distribution, and use. All pesticides used in Canada must be registered under the Pest Control Products Act.

Rodenticide - A chemical substance or cultured biological organism used to kill or used to control or prevent the development of rodents.

Sustainability - refers to societal efforts that meet the needs of present users without compromising the ability of future generations to meet their own needs.

References cited:

http://www.epa.gov/

http://www.sfenvironment.org/

http://www.calgary.ca/CSPS/Parks/Documents/Planning-and-Operations/Pest-Management/integrated-pest-management-plan.pdf?noredirect=1

http://www.cityofgp.com/index.aspx?page=956

http://laws-lois.justice.gc.ca/eng/acts/P-9/

http://www.reddeer.ca/City+Government/City+Services+and+Departments/Recreation+Parks+and+Culture/Parks/Trees+Wildlife+Weeds+and+Pests/Integrated+Pest+Management.htm

http://www.edmonton.ca/for_residents/pest-management.aspx

http://www.lacombecounty.com/index.php?option=com_content&view=article&id=44&Itemid=174

http://www.th.gov.bc.ca/invasiveplant/documents/Pest_Management_Plan_MoTH.pdf

IPM team and associated roles:

1. University of Calgary Facilities – Municipal Services
    a. Manage pest control contract.
2. University of Calgary Facilities – Zone Managers
    a. Liaise with building end users when pests are identified.
3. University of Calgary Facilities – Customer Care Centre
    a. Field calls from Zone Managers and building end users and dispatch pest control service specialists.
4. Steritech/Rentokil - Pest Control Provider District Manager
    a. Ensure work performed meets/exceeds pest control contract.
5. Steritech/Rentokil - Green Pro certified Service Specialists
    a. Carry out monitoring programs.
    b. Liaise with end users to address trouble calls.
        i. First action taken is to confirm identity of pests.
        ii. Second action taken is to implement exclusion controls and least toxic chemical controls available.
        iii. Third action taken is to monitor effectiveness of controls.

Identifying and monitoring pests:

1. The provisions for identifying and monitoring pests will include the use of insect glue board monitors and mechanical traps for the interior of the facility and bait stations on the exterior perimeter of the complex.
2. There is a log book on site that is kept in a designated location to provide a communication medium between U of C staff and the Pest Control provider.
3. Pest population monitoring are done through an electronic reporting system providing up to date activity reports to both the Pest Control Vendor and designated U of C staff.
4. Quarterly meetings between U of C's designated representative and the university's pest control service provider will be conducted to ensure that the IPM program and all its components remain up to date and relevant.

Action thresholds for all pests likely encountered in the building:

1. The expected pests are (with corresponding thresholds in brackets):
    a. Cockroaches (1)

b. Mice (1)
c. Bedbugs (1)
d. Ants (10)
e. Occasional invaders (5). Occasional invaders are insects that don't normally reproduce in a building, but occasionally invade a building to seek shelter from adverse weather conditions, for example, ladybird beetles.
f. Flying insects (5)

Pest control methods to be used when action thresholds are exceeded:

Cockroaches - Cockroaches are eliminated using a number of different methods including physical removal, trapping, and, as necessary (escalation above least-toxic products), pinpoint treatments of cracks and crevices utilizing insecticidal dusts, baits and liquid residuals. General fogging is used only in the most challenging situations, where appropriate and permitted by law.

Mice -Eliminating entry points, harborage sites, and food and water sources are undoubtedly the most effective methods of eliminating rats and mice. However, baiting and trapping are also effective control methods. Multiple catch traps, and various other trapping devices, are strategically placed on the interior as needed, or as required. If escalation is required, rodenticide baits would then be used.

Ants - Steritech has developed a number of innovative treatment methods to combat ants. Exclusion at ant entry points is our first choice. If ant activity continues, escalation to pesticides would follow, using various formulations of insecticidal ant baits, including non-repellant solids, liquids and granules, giving preference to the least toxic/least volatile/lowest exposure product available.

Occasional Invaders - Exclusion is the most effective method of keeping these pests out of the buildings. This can achieved with caulking, screening and door sweeps. Modification of exterior lighting can often be effective in reducing the attractiveness of the building. Occasional invaders that are also flying insects can often be controlled with insect light traps. Escalation to pesticide products would include residual treatments, usually to the exterior of the building, giving preference to the least toxic/least volatile/lowest exposure product available.

Flying Insects - Insect light traps are the main method of control. Sanitation is used to eliminate any breeding sources. In emergency cases, a space treatment using synergized pyrethrins could be used, if needed.

Please note:

- The process will be to exhaust non-chemical control methods first, and if they fail to provide control, that will be the reason to escalate to a pesticide product.
- Almost all the products on the *2016 San Francisco Reduced-Risk Pesticide List* are not registered in Canada, especially the Tier III products that mostly comprise of essential oils and similar reduced-risk active ingredients.
- Most Tier III "type" insecticide products available in Canada contain the active ingredients Boric Acid and Diatomaceous Earth (Silicon Dioxide).
- These are normally formulated as dusts or baits, hence should be similar to US Tier III pesticides.
- The University of Calgary has requested from their pest control contractor to put these products into use going forward.
- If mechanical or least risk means of control fail to address an infestation, our pest control contractor will provide 24 hours notification to the Facilities representatives that they plan to use. (**See APPENDIX 1**).

Mechanisms for documentation of inspection, monitoring, prevention, and control methods and for evaluation of the effectiveness of the IPM plan.

- Since 2011 the University of Calgary has recorded all pest control complaints in our ARCHIBUS Work Request System.
- In addition our service provider has set up an online portal which provides a variety of on-demand reports. For detailed information regarding our service provider's reporting capability please reference:

Client Portal Ref Guide.pdf

- U of C IPM Team members and Steritech team members review the report metrics on a quarterly basis. Focus is on pest activity levels which we classify as light, medium or heavy.

Appendix 1

NOTICE FOR OCCUPANTS OF A PESTICIDE APPLICATION TO A UNIVERSITY BUILDING OR ON UNIVERSITY GROUNDS

Dear Occupant:

1. Integrated pest management procedures such as inspections and monitoring are used to identify conditions contributing to pest problems and to determine when to control pests.
2. One or more pest control methods that would be used as a first response include:
    a. Sanitation
    b. Structural repair
    c. Other nonchemical methods (i.e. glue boards)
3. If it is determined that nontoxic options are unreasonable or have been exhausted, the use of a pesticide may be utilized to control the pest problem.
4. This is a notice to inform you that a pesticide will be applied at the following site as described below.
    a. Common Name of Pesticide To Be Applied:
    b. Pest Control Products Act Registration Number:
    c. Location(s) of the Pesticide Application:
    d. Planned Date and Time of Application:
5. For applications intended for exterior grounds, if unfavorable weather conditions or other extenuating circumstances arise, the intended pesticide application may have to be delayed or postponed to a later date.
6. If the application cannot be made within 14 days of the original planned date, a new notice will be issued.
7. Should you wish to receive obtain additional information regarding this notice you can contact:

U of C Facilities Customer Care Centre

T: 403-220-7555

Email: myfacilities@ucalgary.ca