University of Colorado at Boulder

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Integrated Pest Management
UCB Program Overview

Executive Summary

A campus wide policy was passed on March 12, 2002. The policy, signed by the Director of Environmental Health and Safety, assigns the Executive Director of Facilities Management (F.M.) with the responsibility of implementation. The Executive Director of F.M. in turn appointed the department's Environmental Operations Manager as the Campus IPM Coordinator.

Short and long term program and policy goals can be divided into several areas: research labs, noxious weeds, turf management, and funding. Research labs appear to have been neglected for many years in regard to pest control. Research grants stipulate that pest control activities will not affect the results of any given experiment. The result of this language has been a fear on the part of researchers to introduce pesticides into a research setting. New techniques, including bio-controls, allow for effective pest control without the use of pesticides in research labs.

The noxious weed program continues to move toward a more consistent approach but is struggling due to a lack of resources. The main objective has been to reduce the densities of noxious weeds while encouraging native competition through re-seeding. To date, this has been an effective containment technique on the lands it has been applied to. The control methods are primarily mechanical, in the form of mowing, hand removal, and grazing. Volunteers and seasonal employees are used for a good portion of this work. The program has also been working with a biology professor to release weed-eating insects (bio-controls). This is showing very promising results.

The turf management program got its formal start in March of 2002, beginning with the hiring of a new turf manager/irrigation officer (with a turf-grass management degree), the subsequent hiring of an assistant turf manager in September of '03, and the purchase of some very specialized pieces of equipment, such as slit seeders and deep tine aerators. The Turf-grass program for lawns and recreational fields uses various methods of turf management to improve the health and appearance of the turf on campus.

Policy Overview

It is the purpose and intent of the UCB IPM Policy to ensure that University departments and all those who apply pesticides to University property utilize integrated pest management (IPM) practices, eliminate or reduce pesticide applications to the maximum extent feasible, and take all reasonable measures to ensure that pest control activities do not threaten environmental and human health. Particular attention shall be paid to avoiding the use of sprays and aerosols.

This policy applies to all University of Colorado owned and managed buildings and property. The University of Colorado will provide in-house pest control service in addition to the option of using an off-campus contractor. Contractors will comply with all aspects of the University IPM policy.

Section II of the policy defines Integrated Pest Management (IPM) as an effective and environmentally sensitive approach to pest management that relies on a combination of commonsense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interactions 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 programs take advantage of all pest management options possibly including, but not limited to, the judicious use of pesticides.

Section II further defines Pests as populations of living organisms (animals, plants, or microorganisms) that cause damage or interfere with the use of UCB facilities and grounds for human purposes. Strategies for managing pest populations will be influenced by the pest species and whether that species poses a threat to people, property, or the environment.

The IPM policy established a process for the review and approval of pesticide applications on campus. This policy forbids the use of privately acquired pest control sprays (e.g., Raid, ant killers, etc.) by individual students, staff or faculty. Departments designate an IPM liaison or contract with in-house services, provided by Facilities Management. Liaisons submit pest control plans to the IPM coordinator for review prior to any pesticide applications. Based on action thresholds for each pest, a treatment is selected that is:

1. Least hazardous to human health;
2. Least damaging to the environment;
3. Effective at controlling the pest;
4. Has minimal impacts on non-target organisms;
5. Within available resources.

Educational Opportunities

Leading up to the passage of a campus wide policy, Facilities Management staff engaged in an environmentally friendly pest control education campaign. The main focus of the effort has been directed at campus staff in the form of newsletter articles, campus bulletins, e-mails lists, and more recently, presentations to the campus community under the umbrella of the Facilities Management Safety Committee.

The most recent of these sessions has focused on the West Nile virus (**See attached power point presentation**). Half a dozen presentations were made to campus staff and students in 2004. The sessions emphasized personal protection from the West Nile virus without the use of harmful spray pesticides. A guide to mosquito repellents was also created so that students, parents, faculty, and staff could make informed decisions about what product to use. (**See attached Comprehensive Guide to Mosquito Repellents**). Grounds crew employees were also given a dedicated training on the issues surrounding the safe and effective use of mosquito repellents. (**See attached power point presentation**)

Lastly, a yearly training is conducted with all the building proctors on the basics of integrated pest management. As these are the people responsible for many facets of building use, the focus is on good maintenance and sanitation practices. For instance, we encourage them to call in any broken or missing screens, caulking and sealing needs, leaking pipes, etc. They are also reminded that the use of personally acquired pesticides is forbidden under campus policy.

In addition to a campus educational campaign, staff has worked with individual departments and faculty members to create independent study research opportunities. Examples of these include:

1. IPM Strategic Plan for the Bruce Curtis Museum Collections Building, Fall 2002
2. IPM Strategy for Mosquito Control at CU, Fall 2002
3. Introduction of Parasitic Wasps for the Control of Cockroaches in the Ramaley Biology Building, March 2003-October 2003
4. Introduction of Biocontrols for the Control of pests in Campus Greenhouses, Fall 2004. (**See attached Greenhouse Biological Control Manual**)

In each of these cases, students worked directly with Facilities Management staff and Biology professors to design and implement IPM strategies for the control of structural and ornamental pests. These procedures were then adopted as standard operation procedure for campus pest control.

Outreach Programs

PRESENTATIONS

- Colorado Sustainability Summit. "Alternatives to Pesticides at CU." CU Boulder, 2005
- Education For Sustainability. "Student Research Opportunities in Integrated Pest Management." University of Portland, Portland, Oregon, 2004.
- University of Colorado Museum. "West Nile Virus 101 / Integrated Mosquito Management." Student presentation. CU Boulder, 2004.
- Emergency Management Operations Group. "CU Boulder West Nile Virus Action Plan." CU Boulder, 2004.
- Boulder City Council Invited Speaker. "Limitations of Spraying for Adult Mosquitoes." Boulder, CO, 2004.

- Environmental Law Society Debate Series. "Should the City of Boulder Spray Adulticides to Control Mosquitoes?" Debated Professor Lakshman Guruswamy. CU Law School, 2004. Roughly 50 students in attendance.
- Facilities Management Safety Trainings. Presented to multiple campus departments. "West Nile Virus Preparedness and Prevention." CU Boulder. Hundreds of people in attendance.
- Facilities Management Grounds All Staff Mtg. "Proper Use of Repellents." June, 2004.
- Campus Environmental Roundtables. Held quarterly, well attended by campus faculty, students and administrators. "IPM Annual Report Overview and State of Campus Recycling Program." CU Boulder, 1998-2005.
- Facilities Management Building Proctor Training. "Fundamentals of IPM." CU Boulder, 2003. Over 100 people in attendance.
- Campus Earth Summit. "Campus IPM Programs, A Comparative Look at Berkeley, New Mexico and Boulder." CU Boulder, 2003.
- Big 12 Food Service Conference. "Integrated Pest Management in Food Service." CU Boulder, 2003.
- Beyond Pesticides 19th Annual National Pesticides Symposium. "Tools for Implementing School IPM." Boulder, CO, 2001.
- Guest lecture for Ecology & Design class (ENVD 2003), CU Boulder, 2001.
- Radio interview, KGNU 88.5 FM. Interview with Mark Ruzzin "Pesticide Use in Boulder" 2001.
- Sierra Club presentation. "Are There Safe and Sustainable Alternatives to the Use of Pesticides?" CU Boulder, 1999.

COMMUNICATIONS

Routine notification to campus community in advance of any major pesticide applications is done through the campus administrative e-memo system as well as press releases to campus and regional newspapers which reaches all students, faculty, and staff.

SIGNAGE

Pre-application Notification: **See attached Flier and Photo**
Post-application: In accordance with State rules and regulations, grounds staff posts yellow notification flags. Frequency of posted flags as well as duration of posting greatly exceeds State requirements.

Structural Building Standards

Caulking

All cracks and crevices noticed during construction to prevent pest entries. This includes cracks around the floors, walls, in the interior. Pipe conduit for any and all service types should also have caulk that seals the entry. All bathrooms should have all utilities sealed at the base and sides and also pipe entries. The doors and windows should be caulked from the outside and inside to prevent pests. All cracks and crevices on the exterior should also be sealed to prevent pests. This includes but not limited to walls,

roofs, soffits, and any other sites that could lead to pest entry. The materials used should be with a 10-year warranty.

Cooling Towers

All towers on the rooftop should include bird exclusions to prevent the nesting and roosting of birds. Includes but not limited to the top edge with electric track, and any other potential bird nesting sites within the structure. Screening off access openings those birds would use for nesting. This should be a hardware cloth material that birds couldn't pull off or work out to gain entry. On all units the objective is to repel the birds from the units. All work should include a 10-year warranty.

Cupalos

Any and all openings that resemble cupola's should be screened off to prevent birds and raccoons from using for nesting or entry. The screens should meet with building standards set by the campus. The screens should have frame around the openings to attach to so future access can be gained. The whole unit will be powder coated to prevent rust from bleeding down the structure. They will meet the likes of what the campus has in place now. The campus architect will approve these before placement is granted. All work and material will carry a 10-year warranty.

Floor Drains

To prevent pest from entering through the drain system a crosshatch design cover will be used over the drain openings. The maximum size of the opening on the cover should be less than ¼ inch. If this requires a larger opening due to the design for operation the cover will have to be approved by the Campus IPM Coordinator prior to installation.

Landscapes

Landscape next to buildings should have a barrier to prevent pests. Rock beds that extend three feet away from buildings will prevent rodents from building burrows next to buildings. The rocks should have at least a two-inch depth all around. The diameter of rock is at least one inch or larger. The landscape must move water away from the building.

Ledges

All ledges that extend outside or around the buildings will attract birds. If the building has openings or any type of ledge that they can land on they will find it. Bird prevention can have many tools and the choice can be electric track to bird flight material and also mechanical means that include contractors Styrofoam and other building materials. All means of bird control will have the IPM Coordinator approval before installation. The work will carry a 10-year warranty.

Screens

All windows will come with a screen to prevent pest from entering. Any openings that could lead to pests outside the building will be screened off. The screen will be able to prevent the pest from entry and also be strong enough to withstand rodents pulling apart. The screen will be matched to the window and approved by the architect before installation. Any other screen material used for covering holes will also be campus standards. The work for any and all screen will come with a 5-year warranty.

Building Materials

The material used for construction will be place so as not to create pest problems. All construction material will be off the ground at least six inches so inspection would reveal pest problems. The ground that material is placed on should be concrete or pavement and if this is not possible than the prior instructions will be followed. If pest do become active than the contractor must have the campus pest professional handle the problems. The campus will charge the contractor for this service.

Ornamental Design and Maintenance Standards

Turf / Recreational Fields

The following information is designed to guide the University in proper design, installation, and maintenance practices for the purpose of avoiding the use of synthetic pesticides on recreational fields. Much of this language was included in a student government bill to fund the installation and renovation of several new and existing recreational fields on campus. (**See attached Recreation Bill**)

Facilities Management has also devised a comprehensive turf plan to guide the University in proper maintenance practices on existing turf areas across campus. (**See attached Turf Plan)**

The use of these pesticides is most commonly attributed to poor construction and maintenance standards. With proper forethought these conditions, most notably poor turf density, can be avoided, thereby eliminating the need for the use of synthetic pesticides.

In short, good turf management can be summarized in two simple steps: 1. Proper installation, and 2. On-going maintenance.

FIELD PREP AND INSTALLATION:

A. Soil profile
   -Organic content, to a depth of at least 12 inches
B. Clay content
   -as little as possible
C. Drainage
   -higher sand content
D. Proper grading

-laser grading of surface

E. Turf species
-Kentucky bluegrass, perennial ryegrass*

F. Irrigation install
-Spacing (to insure adequate coverage and minimize water waste)

* Although other, more drought tolerant grass species are available, they tend to be clump grasses and are not suitable for recreational fields.

MAINTENANCE:

A. Mowing
- A 2-inch height of cut to encourage lateral growth and increase turf density

B. Fertilization
- Synthetic, organic, p.c.u. (or s.c.u.) to provide extremely vigorous growth

C. Irrigation practices
- Deep and infrequent to improve root depth

D. Aerification
- To remove compaction and increase oxygen content in the soil

E. Seeding
- Aggressive over seeding and slit-seeding to replace lost turf

F. Topdressing
- Top-dress at least once per year with sand peat mix

G. Compaction
- must be relieved with aggressive aerification multiple times per year to avoid poor drainage poor turf growth and playability

H. Litter/debris
- Generated by special events that allow glass bottles and improper clean up, which can cause serious injury to recreational users.

I. Frequency and timing of use
- Most impact to field conditions is over-use and improper use when conditions are not optimal.

Examples of Poor Maintenance Contributing to Weed Problems:

- Compaction – encourages plantain
- Low Nitrogen – contributes to clover
- Poor turf density/bald spots – allows establishment of dandelions and other weed seeds.
- Poor drainage/over watering – inhibits root growth.

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