

INTEGRATED PEST MANAGEMENT PLAN

UNIVERSITY OF CALIFORNIA
MERCED

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UC Merced

Integrated Pest Management Plan for Indoor and Outdoor Pest Control

2019

The purpose of this Integrated Pest Management (IPM) Plan is to guide the use of environmentally sensitive pest management strategies and least-toxic control methods on lands managed and owned by the University of California, Merced (UC Merced). Integrated Pest Management (IPM) is defined as managing pests (plants, fungi, insects and/or animals) in a way that protects human health and the surrounding environment and that improves economic returns through the most effective, least-risk option. Core elements of IPM include:

- Use of least-toxic chemical pesticides
- Minimum use of chemicals
- Use of chemicals and pesticides only in targeted locations and for targeted species
- Routine inspection and monitoring
- Proactive communication

Goals

To minimize the impact of site management practices on the local ecosystem, and to reduce exposure of occupants, staff and maintenance personnel to potentially hazardous chemical, biological and particulate contaminants.

The Plan addresses environmental best practices for:

- Outdoor integrated pest management
- Indoor integrated pest management

Scope

This plan provides guidelines for protecting and enhancing the natural diversity of the UC Merced Campus Site, while also supporting high-performance building operations and developing synergies between the buildings and their environmental context. The IPM Plan covers the all buildings and associated grounds.

Responsible Parties

The Facilities Management Department, specifically each building manager, is responsible for

managing the implementation of the IPM Plan. The UC Merced Sustainability Team, Environmental Health and Safety Department (EH&S), and the Physical and Environmental Planning Department (PEPD) will provide support, oversight and guidance to the Facilities Management Department. Contracts with pest and landscape management vendors shall include extensive language describing their role in implementing the IPM Plan. Contractors involved with various elements of the IPM Plan shall carry out their tasks according to their contracts, and report all relevant activities to the aforementioned parties. On occasion, several contractors may be engaged simultaneously in various elements of the Plan at the buildings and grounds. To ensure an effective and coordinated effort, the building staff responsible for overseeing the IPM Plan shall review all proposed activities before implementation.

Title	Contact	Phone	Area of Responsibility
Assistant Vice Chancellor – Facilities Management	ttoth@ucmerced.edu; fmhelp@ucmerced.edu	209.228.7659	Grounds Maintenance, Central Plant Operations, Physical Plant Operations, Building Management
Director Physical and Environmental Planning	pwoods3@ucmerced.edu	209.349.2561	Permit Compliance
Director of Sustainability	mmaxwell@ucmerced.edu	209.228.4300	Sustainability Reporting

Quality Control Process

The party(s) responsible shall periodically evaluate the success of the IPM Plan. This evaluation may include producing and providing a report on an annual basis to senior management. Whenever possible, the annual reports shall include an evaluation of the performance, safety, cost and environmental/public health benefits achieved as a result of its implementation.

Prior to implementation, service providers involved in the Plan shall submit all proposed pest management activities to the responsible parties, listed in Section 3. Upon reviewing proposed activities, the responsible parties shall determine if they meet the criteria of the Plan and approve or deny action. The responsible parties, listed in Section 3, shall regularly communicate with all service providers, and conduct regular site inspections and evaluations to ensure that the Plan is in place and functioning as intended. In addition to ongoing quality control measures, the Building Manager will review all practices and products prior to contract renewal (typically annually) to identify opportunities for improvement and expansion of environmentally friendly practices.

Performance Metric

This IPM Plan shall govern all components of pest management at the UC Merced Campus site. The practices identified in this Plan shall be wholly adopted and used in 100 percent of the pest management scenarios at all buildings located at the UC Merced Campus.

IPM Strategies and Practices

Integrated Methods

Integrated methods that make use of monitoring and non-toxic preventative measures (e.g., site inspection and maintenance, cultural controls, pest inspection and population monitoring) will be used to proactively manage and minimize pest issues. Elimination of food, water and shelter sources that attract pests to the interior and exterior of buildings will be used first as a non-chemical control of pests. In the event that monitoring activities reveal a need for the use of pest controls, appropriate control options will be evaluated, and the least-toxic option likely to be effective will be employed.

Least-toxic Pesticides

Least-toxic pesticides, as defined by the City of San Francisco's tier system to define "least-toxic products". The Tier system denotes the level of hazard: greatest hazard (Tier I) to least hazard (Tier III). A hazardous pesticide list can be found in in Appendix B, but may also be found at: https://sfenvironment.org/sites/default/files/fliers/files/sfe_th_reduced_risk_pesticide_list_092518.pdf. If a pesticide is not listed in the list, the product can be reviewed using the San Francisco Pesticide Hazard Review Process.

Emergency Conditions

In the event of an emergency, pesticides may be applied on the grounds without complying with the earlier stipulations for use of integrated and least-toxic methods. Emergencies are defined as infestations of pest species that spread and multiply rapidly, and/or specific situations that directly affect occupant health or pose a threat to the integrity of the buildings.

Universal Notification

UC Merced has adopted a universal notification system if a pesticide, other than a least-toxic pesticide as defined above, must be applied on site. This strategy requires the site and its vendors to notify building occupants at least 24 hours in advance of a pesticide application under normal circumstances and no more than 24 hours after an emergency application through posted signs or other means of reaching 100 percent of occupants. This notification system enables occupants and staff, and especially high-risk occupants such as children, pregnant women and the elderly, to modify their plans based on pesticide use at the building.

Notification must include the following:

- Pesticide product name
- Active ingredient
- Product label signal word (e.g., “caution”, “danger”)
- Time and location of application
- Contact information for persons seeking more information

Recordkeeping

Recordkeeping is required to demonstrate ongoing compliance with the IPM Plan. All applications of pesticides (including least-toxic options) shall be logged. The pesticide application log shall include the following information:

- Universal notification to occupants, if required
- Date
- Time
- Method
- Pesticide application date and time
- Application technician or manager
- Location
- Target pest
- Pesticide trade name
- Pesticide active ingredient
- EPA registration number
- Least-toxic status (Y/N)

Cleaning Practices

In the event that cleaning products are used as a component of IPM Plan, they shall meet LEED-EBOM criteria for sustainable cleaning products.

Animal & Vegetation Pest Control IPM Best Practices

Environmental best practices described below are incorporated into vendor contracts / Standard Operating Procedure language as appropriate. The control of pests (invasive plants, fungi, insects, animals) is a critical function at this site, as is the environmental and health effects of misuse or overuse of toxic chemical pesticides. This pest control program outlines the most effective, lowest-risk options for controlling pests. The guiding principle of this policy is to use non-chemical practices whenever possible; reduce threats to sensitive plant and animal species, including threatened and endangered species; use the least-toxic chemical pesticide that serves a particular need; the minimal use of chemicals; use of chemicals in carefully targeted locations; and use only for targeted pest species. This plan is integrated with the indoor portion of the IPM Plan and follows many of the same guidelines.

The Pest Control Operator (POC) providing services to UC Merced will maintain a complete, accurate and up-to-date archive of all pest control files. These files are to be stored at the UC Merced maintenance office. These files include:

- Current business license
- Proof of indemnity insurance
- Certification for all Pest Control Operators in accordance with state requirements
- Current Material and Safety Data Sheets (MSDS) and sample labels for all products used
- Documentation to verify that all pesticides, chemicals and compounds used meet applicable regulations and approvals (EPA, USDA, OSHA, etc.)
- Documentation to verify that all pesticides, chemicals and compounds used are the least toxic options available which meet the minimum program objectives
- A complete, accurate and up-to-date archive of service reports will be available for review in the maintenance office. This review will be performed every 30 days/months. These reports will contain documentation of the following:
 - Services performed
 - Types and amounts of chemicals used
 - EPA or other applicable regulatory registration numbers
 - Locations treated
 - Targeted pests
 - Signs of activity
 - Applicable follow-up actions

Steps for Implementing the Indoor/Outdoor Integrated Pest Management Plan

Review Integrated Pest Management Plan

Assemble required documentation for records archival. Documentation shall include record of all business licenses, proof of indemnity insurance and certification for all PCOs in accordance with state requirements. The archive shall also include current MSDS and sample labels for all products used. Verify that all pesticides, chemicals and compounds used meet applicable regulations and have required approvals (EPA, USDA, OSHA, etc.). The archive must be kept complete, accurate and up-to-date.

Service reports, generated at the frequency described in the contract or in the program, must be complete, accurate, up-to-date and available for review. These reports must record all services performed, types and amounts of chemicals used, EPA or other applicable regulatory registration numbers, the locations treated, targeted pests, signs of activity, and applicable follow-up actions.

Live-catch devices and glue boards must be maintained, kept clean and checked regularly, usually daily and at least weekly. The PCO must scan or sign and date the labels on all devices. If punch cards are used, the PCO must punch them for all devices. These labels should be on the inside of the devices, unless they are mechanical devices with a clear window.

A number of interior pest control devices adequate to provide complete and uniform coverage of the facility must be spaced at consistent intervals (typically 25-40 ft.) around the interior perimeter of the facility, including mechanical stations and within 10 ft. of both sides of doors leading to the exterior (including dock doors). Pest control devices must also be used in dry storage areas, coolers, locker rooms, and break areas. These devices must be located so that they do not contaminate any product, packaging or equipment. A number and/or color code must correspond with the master identification map. Bait is not to be used inside the facility. Interior pest control devices must be maintained, kept clean and checked at least monthly.

Tamper-resistant exterior pest control stations must be spaced at uniform intervals (usually 25-50 ft.) around the building's exterior perimeter. Stations must be secured in place next to the building, closed, and require the use of a key or a tool (e.g., Allen wrench) to open. Bait must be anchored inside the stations to avoid being removed by a rodent or becoming dislodged during heavy rains. Bait in the exterior stations must have a fresh appearance. These devices must be located so that they do not contaminate product, packaging or equipment. The number and location code must correspond with the master identification map. Exterior pest control devices must be maintained kept clean and checked at least monthly.

Verify that there is no evidence of exterior pest activity.

Verify that there is no evidence of interior pest activity.

Verify that there is no evidence of decomposed rodents anywhere in the interior of the facility,

including in pest control devices.

Verify that there is no evidence of insects, spiders, rodents or birds on or in any food ingredients, products or packaging materials.

Insect light traps (ILTs) and flying insect traps may be used. Placement must be according to manufacturers' instructions and comply with applicable regulatory processes. If specific instructions are not available, ILTs must be more than 4 feet off the ground, at least 10 ft. from covered/protected products or packaging and at least 30 ft. from exposed product, packaging, or equipment. They must be located to avoid interference with plant operations. They must be cleaned and maintained on a scheduled basis. Bulbs must be changed at least annually, and shatter protection must be in place. There must be a schedule for replacing the sticky boards in sticky-type ILTs.

The use of avicides is prohibited.

All pesticides, chemicals and other compounds stored on site for pest control must be properly labeled and kept in locked, secured areas away from food storage areas.

Outdoor/Indoor Reduced Risk Pesticides Selection Procedure

Use the least-hazardous methods available to remove and deter pests. Using the SF Pesticide Hazard Screening List's Tier III Hazard Criteria, select a Tier III product for initial use. If Tier III products prove insufficient to mitigate the pest problem, Tier II products may be substituted. Ratings of pesticide products are listed in Appendix B, but may also be found at:

https://sfenvironment.org/sites/default/files/fliers/files/sfe_th_guide_to_reduced_risk_pesticide_listposted.pdf.

Only after all Tier III and II options are exhausted may a Tier I product be used. The SF Pesticide Hazard Screening List is to be used as a guideline; other, less hazardous products may be substituted. Facility management and the PCO should coordinate with the pest control vendor and their suppliers to determine the least hazardous method available before using Tier II and I products. Second generation anticoagulant rodenticides (i.e., Brodifacoum or Bromadiolone) shall not be used unless first approved by a representative of the UC Merced Physical and Environmental Planning Department (contact information can be found on the UC Merced website -

<https://planning.ucmerced.edu/contact-us-0>) to confirm compliance with the University's environmental permits.

Chemical Storage Practices

Storage Areas

Storage areas must be dry, frost-free, well-ventilated and secure.

Storage areas must be situated away from other buildings, especially residential buildings or areas where food or flammable materials are stored.

Storage must be built to resist foreseeable accidents, including leakage and spillage, fires and the weather. Ensure there is no risk of spills polluting ground water and local bodies of water.

Floors must be impervious to liquids, anti-slip, chemical-resistant, washable and with a means of diverting spills.

Drains must lead to sumps or tanks large enough to contain any foreseeable

leaks. Shelving must be appropriate for the size of the containers stored in them.

Flammable pesticides must be separated from other pesticides.

Consideration must be given to possible reactions between chemicals coming in contact with each other.

Labels

Make sure all pest control chemicals are clearly labeled stored with the manufacturers' instructions for use.

Chemicals must never be placed in unmarked containers.

Product Information

Effective first-aid provisions must be available together with data sheets on all the products in the storage room and the chemical safety precautions.

Emergency telephone numbers must be listed in a key location in the storage facility. These numbers and other emergency facilities must be checked and updated as necessary.

Signage

Display hazardous chemical storage warning signs at all storage locations without

attracting unwanted attention.

Chemical Preparation and Handling Practices

Choosing Chemicals

Identify which pesticides and herbicides are being used and the exact problems they are intended to resolve. The more that is known about the problem, the less chance there is of

making a mistake. The words organic, natural and biodegradable in this context do not guarantee that they are safe.

Mixing Chemicals

Accurate measurements must be made during both mixing and application phases. Use the most suitable chemical, in the minimum necessary amount, to achieve the desired results.

A safe area must be available for mixing pesticides. This must be done on a concrete pad, with a separate sump or tank to contain any leakage.

Health Precautions:

Operators must be provided with and adequately trained in the use of the necessary equipment and protective clothing.

Proper health surveillance must be available to all those working with pesticides and herbicides.

Neighbors and others in the area must be warned of the spraying program in advance of and during applications.

Chemical Transport

Only the quantity of pesticide and herbicide appropriate for immediate use may be removed from the pesticide store.

Do not transport chemicals in vehicles used for carrying people or food.

Chemical Application Process

User Qualifications

In many instances it will be necessary to call on outside expertise to advise on pest management problems, particularly in the creation of customized integrated pest management programs, which may require detailed knowledge of the biology and ecology of a particular species.

If pesticides are required, the IPM specialist shall communicate with the Property Manager to determine the best product and application in accordance with approval requirements.

A specialist must supervise and control the preparation and use of chemical applications.

Species Considerations:

Time the treatment to coincide with the presence of the pest.

Use a selective chemical that has the least effect on non-target species and treat only the area affected.

User Safety:

Users must wear protective clothing and headgear and are to change clothing and wash thoroughly with soap and water after applying pest control chemicals.

Ensure that anyone handling toxic chemicals never works alone and that the work area is well-ventilated.

Users must wear respirators for all outdoor spraying or dusting of organic phosphorus compounds.

Eating, drinking and smoking must be prohibited while using or handling chemicals.

Users must be familiar with the effects on the body of the chemicals they are likely to be using and how those chemicals may enter the body.

Users must be aware of the signs and symptoms of acute poisoning related to chemicals they are using. If signs, symptoms or other illnesses develop, users are to discontinue work and seek medical attention.

Limited Access:

The area of application must be clearly marked and unnecessary access restricted while spraying is in progress.

Building occupants must receive notification of any pest control management measures prior to implementation. When application or spraying is in progress, building occupants must be notified and kept away from the area in which it is taking place.

Following application of chemicals, control the reentry of people into the treated area for the period of time specified by the IPM specialist.

Equipment:

In order to minimize spray drift and potential threats to users' health and safety, equipment must receive regular inspections and maintenance in accordance with manufacturers' specifications.

Weather/Time Restrictions:

Spraying must not be carried out in wet, windy or otherwise unsuitable weather. Anyone operating sprayers must have access to a wind-speed meter and only spray when wind speed and precipitation are negligible.

Hours of chemical application must be scheduled so that building occupants are not exposed to hazardous chemicals.

Chemical Disposal Practices

Conditions of Disposal:

As most pesticides and herbicides are extremely toxic, proper disposal of unused chemicals is paramount to maintaining the health of building occupants and the safety of the environment. Disposal methods will vary, depending on:

- Quantity of waste for disposal
- Chemical and biological degradability of the active ingredients
- Toxic properties
- Concentration
- Physical form of the waste
- Disposal options available

General Guidelines:

Always follow the manufacturers' and/or suppliers' instructions, even when disposing of empty containers.

Landfilling or incinerating pesticides and herbicides is not to be permitted.

Segregate pesticide/herbicide wastes from general building wastes.

Containers/Labels:

Never transfer pesticides to unlabeled or mislabeled containers. Keep all chemicals in clearly labeled containers until disposal procedure is complete.

Do not reuse pesticide/herbicide containers.

Puncture all containers after initial use to prevent reuse.

Authorization:

Use an authorized waste-disposal contractor. Use an authorized disposal site.

Basic Vegetation Pest Control Practices

Maintenance:

Keep the building grounds well-maintained at all times.

Maintenance personnel shall maintain an even and uniformly distributed layer of weed-preventing mulch to plant beds.

Plantings:

Avoid monocultures by mixing plant species in planters and gardens, according to the approved landscaping plan.

Manual Controls:

Landscaping shall be hand weeded and chemical control of vegetation shall be kept to a minimum.

Chemical Controls:

When chemical use is necessary, replace hazardous substances with least toxic chemicals as specified in the San Francisco Pesticide Hazard Screening List's Tier III Hazard Criteria.

Inspection Schedule and Location:

The landscape contractor shall visit the site at regular intervals to monitor and apply vegetation pest control operations.

Basic Animal Pest Control Practices

Site/Building Cleanliness

Keep refuse containers clean, free of odors and covered at all times. Sanitation measures reduce habitat and food sources for pests.

Keep areas around refuse containers free of spillage and prevent the accumulation of trash or debris on the ground around or underneath the containers.

Keep grounds free of high weeds, trash, old equipment and debris, as these conditions create ideal harborage for rodents.

Structural Integrity

Maintain the building envelope in good repair with no holes or openings larger than ¼ inch. Pay special attention to areas surrounding windows, doors, fans, vents, etc..

Address any deficiencies in the building envelope with corrective measures. Install or replace weather stripping and doors and windows; repair or replace screens; cement, caulk or patch holes or cracks in finishes as necessary.

Maintain door sweeps on all exterior doors.

Outside Building

Prevent trash buildup outside buildings to prevent attracting wildlife. The University's environmental permits, including UC Merced's Incidental Take Permit (No, 2081-2009-010-04) and Biological Opinion (Corps project #1999900203) require the University shall ensure that trash and food items are contained in closed (animal-proof) containers and removed regularly (at least once a week) to avoid attracting opportunities predators such as ravens, coyotes, and feral dogs.

Inspection Schedule and Location

Visual inspection for pests shall be performed at least two times per month and

treatment shall be provided as necessary. After each visit, the pest control contractor shall provide a printed service report that includes written observations, recommendations and details of IPM activities.

Species-Specific Pest Control Strategies

Ants

In areas where ants are present, wipe the areas down with soapy water in order to prevent the formation of major scent trails. If there already is an established trail, wipe backwards from the food source to the entrance of the trail.

Block all entry points to the building – ants will give up trying to find a way through after 1-2 days. Temporary blockades can be made using sticky substances such as petroleum jelly or chili powder, or cinnamon. If these measures do not work, only then may boric acid be used, but you must utilize the Universal Notification procedures found in section 6 of this plan.

Always keep opened foodstuffs in sealed containers or store them in the refrigerator or freezer. Clean out kitchen cabinets, drawers and shelves to remove crumbs and stains. Keep sinks and worktops clean and dry.

Baits are best put in the path of an ant trail and then removed after the ant activity stops, before they lure ants from another colony to the area.

Prune branches close to the building and removed fences or anything that might create a bridge for the ants to cross.

Low toxicity compounds to control ants include diatomaceous earth (DE), a chalk-like powder consisting of the fossilized remains of diatoms, a type of hard-shelled algae.

Aphids

Manage sap-sucking pest mites and whiteflies by releasing predatory mites, ladybugs and lacewings onto the grounds several times over a period of weeks.

Consider using parasitic wasps to control scales on trees, shrubs and flowers

Bed Bugs

Dry Heat treatment has proven to be most effective method to battle the bed bugs over the years and should be used as primary method to use for student room treatment.

Contractor will provide and install electrical heaters and blowers capable to heat up the entire room to a 130F. Exposure to dry heat for 2.5 hours assures bed bug, egg and larva death.

External generator, extension cables, junction boxes will be required for adequate power source and will be furnished by the contractor. Placement of the equipment will be coordinated with Facilities Manager.

Fire sprinklers must be covered with adequate insulation caps during the Dry Heat process.

If a bed bug infestation is detected, the most effective course of action is to enlist professional help to inspect the entire building for the presence of bed bugs and treat the affected areas. Use of pesticides to treat bed bugs should follow these rules:

- Only use pesticides that are registered by the U.S. Environmental Protection Agency (look for the U.S. EPA Registration Number on the label) and make sure they are labeled to control bed bugs.
- Do not apply pesticides directly to your body (there are no repellents registered to control bed bugs that can be used on the human body).
- Do not use outdoor pesticides indoors.

Birds

Several species of birds harbor disease and pose a risk to food plant sanitation. The most common species involved are pigeons (*Columba livia*), sparrows (*Passer domesticus*), and common starlings (*Sturnus vulgaris*). Birds pose a threat to the food processor by carrying disease-causing microorganisms, contaminating product areas with excreta, feathers, or external parasites such as mites. The most common microorganism spread by birds is *Salmonella*. *Campylobacter jejuni* has also been readily isolated from wild birds.

The best and most effective means of controlling birds is to eliminate nesting and feeding sites on the building(s) and in the vicinity. This includes initial construction of window, door, and ledge areas to prevent roosting and nesting.

Bird repellent systems can be used to scare and deter birds from roosting areas. These can include decoys of natural predators such as owls and hawks, netting to cover roosting areas, needle strips which prevent roosting, as well as traps to catch and relocate problem birds.

Non-special-status nesting raptors and other migratory birds are protected under the Migratory Bird Treaty Act (MBTA) (50 CFR 10 and 21) and California Fish and Game Code Sections 3503 and 3503.5. According to Section 3503 of the California Fish and Game Code it is unlawful to take, possess, or needlessly destroy the nest or eggs of any

bird except birds that do not naturally occur in California, such as house sparrows or starlings. UC Merced is committed to preventing the take of any federally or state-protected nesting migratory bird. UC Merced personnel will follow all mitigation measures outlined in Mitigation Measure Bio-8 of the University's Environmental Impact Report/Environmental Impact Statement. The measures include not disturbing any native bird from actively nesting.

Caterpillars

Bacterial insecticides derived from natural ingredients are available to control caterpillars.

Cockroaches

Cockroaches contaminate food with their excrement and secrete an unpleasant odor that can permeate the indoor environment.

There are five main species of cockroaches and effective control depends on identifying them correctly.

Integrated pest management measures for controlling cockroaches include effective hygiene and exclusion practices, sticky traps lined with pheromones, and insect growth regulators. If these measures do not work, only then may boric acid be used, but you must utilize the Universal Notification procedures found in section 6 of this plan.

All food handling areas should be cleaned frequently.

Cockroach control is best done by a professional on a contract basis, through the application of least-toxic pesticides.

Control is necessary on a regular basis because of the mobility, reproduction, longevity, and behavior of cockroaches.

Ensure that you know what pesticides are being used by the professional contractor and do not assume they are using an environmentally appropriate chemical.

Dust Mites

Fabrics, bedding and carpets attract and generate dust and dust mites. To keep dust mites at bay, keep building well-ventilated and dry.

Flies

Flies reproduce more readily in waste and manure, which is where control should begin. In warm weather conditions, the reproduction cycle – from egg, to larva, to pupa, to adult winged fly – requires approximately one week.

Collection of waste and residues should be carried out at least twice a week. Keep refuse areas clean to avoid providing flies with breeding grounds

Ensure dustbin lids fit tightly and the interiors of bins are cleaned regularly to keep surfaces free of food material.

Use fine mesh screens at operable windows and private sliding doors as a barrier against entry by any flying insect.

Ultra-violet (UV) fly killing equipment is very effective so long as it is situated per manufacturers' specifications and health department requirements.

UV equipment disguised as uplights in dining and lobby areas are discreet and highly effective because they attract and eliminate flies quickly and silently.

In food preparation areas, UV equipment should only be used once all possible precautions have been taken to keep flying insects out.

Position the UV equipment close to an entry point, at right angles to the nearest competing light source such as a window. In many catering establishments, poorly-situated UV equipment poses a greater food hygiene hazard than lacking pest repellants altogether. This is because when placed next to the food preparation area, they draw flies to the food which they are likely to contaminate before being killed.

Natural chemical treatments for use in kitchens and restaurants include pyrethrum extracted from the *Chrysanthemum cineraria folium* plant, however as this is not classified as a least-toxic pesticide, Pyrethum may only be used once other alternative and least-toxic methods have been exhausted, and only if universal notification is exercised for each application.

Mosquitoes

The best control method for mosquitoes is to eradicate their habitat.

Because they like moisture and lay their eggs in standing water, it is important not to leave flower pots, buckets, plastic sheeting or other open containers outside collecting

water. Ensure that any rainwater collectors are fitted with lids.

Clear debris from gutters and drains to ensure there is no standing water after rain and drain unused pools or fountains so that the water cannot become stagnant. Drain or fill depressions, mud flats, and other areas that might hold water.

Repair leaking taps and air-conditioning units so that puddles cannot form and ensure that septic tanks and sewage systems are properly maintained and in good working order.

Avoid over-irrigating lawns and gardens, and keep weeds and grass (where the insects rest) well-clipped.

If you have a pond or lake on the building grounds, fill it with mosquito-eating fish such as top-feeding minnows or goldfish – they will eat the mosquito larvae before they mature into adults.

Some buildings have successfully reduced the number of mosquitoes and other insects by attracting bats to their property. A simply-built bat house will usually accommodate up to 100 bats.

To prevent mosquitoes from coming indoors, fit fine-mesh screens to porches, doors and windows.

If these measures are insufficient, area repellents such as citronella candles, coils or sprays will repel mosquitoes from porches, patios and other unscreened outdoor areas, although they only work well when the air is still.

Fabric/Clothing Moths

Moth larvae feed on a wide variety of natural and synthetic materials. They can be found in kitchens, food storage areas, clothing, carpets, blankets and upholstery.

Fabrics should be washed and then put in bags and placed in a freezer. When taken out to thaw, shake the fabrics vigorously to remove dead larvae.

Clean the areas where fabrics have been stored with vinegar and water.

Store fabrics in cedar chests or closets. Place cedar chips or blocks or lavender sachets in drawers.

For acute moth problems, re-usable traps can be baited with a controlled release pheromone system to lure moths into the trap and disrupt their mating cycle.

Mothballs not only have an unpleasant odor, but they are also poisonous; avoid them if possible. Insect foggers are not recommended as they can pose a health threat and

are not always effective

Pantry Moths

Clean affected areas by vacuuming all surfaces, walls, shelves, cabinets and floors. Scrub hard surfaces rigorously with hot water and detergent, especially in corners and around the edges of removable shelves. Clean all surfaces that come into contact with food.

Rinse the affected areas with white vinegar, either in a spray or by wiping with a cloth.

Throw away all grain-based food items as well as nuts, raisins, flour and tea, even if it is in sealed containers.

Remaining food items and containers should be thoroughly cleaned with a detergent and water solution and wiped down with a vinegar rinse before being put back. Use air-tight containers made of hard plastic, glass or metal and not plastic bags.

Kill any moths with a fly swatter or moth traps.

After a severe infestation, freezing any new grain products and storing grain products in refrigerators or freezers can prevent re-infestation.

Peppermint gum, bay leaves, peppercorns and cloves may also help deter pantry moths.

Rodents

Rodent control should start with a survey to determine the source of the problem and the conditions that encourage the infestation. Following the survey, implement a program to kill the rodents, removing their sources of food and water, eliminating their place of refuge and making it rodent-proof, and educating and obtaining the cooperation of employees. If the food supply is removed before you eradicate them, the rodents will migrate to other areas, making elimination more difficult.

Openings in building foundations and walls should be closed or screened with wire mesh that has holes not more than 1.25 cm (0.5 in) wide. Where pipes enter masonry, force heavy hardware cloth or steel wool into the opening, and then fill it with concrete.

Continuous surveillance is necessary, and places where rodents have been gnawing to gain entry to a building should be sealed with metal flashing.

Doors are particularly vulnerable to rodent entry so ensure that external doors and

windows close tightly with no gaps at the bottom.

Materials stored in the open, in sheds or in building should be stacked at least 30 cm (1 ft.) above the ground.

Stringent waste disposal practices should be observed – secure all waste in closed containers and not just plastic bags.

Wash dustbin areas regularly. Make sure composting bins are designed to prevent rodents from entering.

If trapping or bait stations must be used, the following conditions should be met:

- A. Indoor rodent control shall be accomplished with trapping devices only. Devices shall be concealed out of general view and in protected areas so as not to be affected by routine cleaning. Trapping devices shall be checked on an approved schedule. Contractor shall be responsible for disposing of all trapped rodents and carcasses in an EPA appropriate manner.
- B. Rodenticides shall be used in exceptional circumstances and Contractor shall obtain approval from the UC Merced Facilities Maintenance Department (fmhelp@ucmerced.edu) prior to any treatment. Second generation anticoagulant rodenticides (i.e., Brodifacoum or Bromadiolone) shall not be used unless first approved by a representative of the UC Merced Physical and Environmental Planning Department. All Rodenticides shall be placed in an EPA approved tamper-resistant bait box. The location of all bait stations should be recorded in
- C. Bait boxes shall be maintained in accordance with EPA regulations with an emphasis on the safety of non-target organisms. Bait boxes shall be:
 1. Securely locked or fastened shut.
 2. Securely attached or anchored to the floor, ground, wall, or other immovable surface so that the box cannot be picked up or moved except when used for baiting in secure or locked areas or inaccessible voids.
 3. Labeled on the inside with the Contractor's business name, address and phone number, and dated by the Contractor at the time of installation and each servicing.
 4. Baited securely in the feeding chamber of the box; bait shall never be placed in the runway or entryways of the box.

The PCO will give special attention to any rodenticide that may cause adverse effects to the San Joaquin kit fox (*Vulpes macrotis mutica*). Kit foxes may be poisoned by either directly ingesting poison, or feeding on a ground squirrel or other rodent that has ingested poison (i.e., second generation anticoagulants).

Slugs and Snails

There are various non-chemical solutions to eliminated slugs and snails, including putting salt or sharp shingle around vulnerable plants, drowning them in beer or simply throwing them over a fence. Elemental copper bands also repel snails and slugs.

Wasps and Hornets

A simple trap can be made by putting beer or a solution of jam or honey and water in an open jar around the grounds. If this does not work, there are branded traps available containing specially formulated attractant baits.

Performance measurement and schedule for reassessment

All pest control activity, including inspections, will be recorded in the IPM tracking tool. The following items will be tracked:

- Pest type and name
- Pest population density and monitoring frequency
- Monitoring method
- Responsible party
- Pest prevention
- Pest action threshold observed
- Prevention measures implemented
- Product applied (name)
- Toxicity of the product (the tier level as determined by the San Francisco Hazard Review Process)
- Date and time of product application (if applicable)
- Date and time of occupant notification (if applicable)
- Emergency application? (Y/N). If yes, an explanation of the emergency will be included.

The overall responsible party will record each pest that is reported by tenants in the IPM tracking tool. The pest control vendor will record the applicable items from each site visit in the IPM tracking tool.

On an annual basis, performance will be evaluated against the goals specified above. If the goals are not being met adjustments will be made to this plan in order to facilitate goal achievement. If adjustments to the action thresholds are necessary, the overall responsible party will work with tenant contacts and the IPM vendor as necessary in order to appropriately adjust the action thresholds.

Pesticide Application List:

Rodenticides actively being used:

Trade Name:	Manufacturer	Active	EPA#
Terad 3	: Bell Labs	ingredient:	12455-10
Blox		Cholecalciferol	

Insecticides actively being used:

Trade Name:	Manufacturer:	Active	ingredient:
		Alpine WSG	
		BASF	

Dinotefuran

EPA # 499-

561

Alpine has a user friendly label and a broad spectrum of site applications, with literally no smell. It's great for eliminating roaches, ants and a wide range of other insects but does nothing for spiders. It is used on an 'as needed basis' only.

Demon Max

Syngenta

Cypermethrin

100-1218

Demon Max is used exclusively outdoors, and mainly for quick knock-down of spiders and wasps. This product is used for spot treatment only. It has a very obnoxious odor so it's normally used when people are not present and never used near water resources.

Almost all pesticides are toxic to aquatic life but pyrethrins are extremely toxic to aquatic life.

565 Plus XLO

BASF

Pyrethum

499-290

565 is a space spray for flying insects. This product is used mostly for flies and mosquitos indoors, and after hours. It is a contact spray only, that leaves no residual pesticide.

InViet Gold roach gel Rockwell Labs Imidacloprid 73079-10

InViet roach gel is a great choice of treatment for roaches, as it can be applied in almost any setting, without interrupting people's environment. It can be used in or out doors. If used outdoors where run-off is an issue, it can be placed in sealed containers where only insects can get.

Max.force Fly Spot Bait Bayer Environmental Imidacloprid 432-455

Fly Spot is a spray-on application to dumpsters, loading docks, and anywhere heavy fly traffic is not desired. As always, placement of this pesticide must take into account any run-off possibilities. This product is mainly used in mid-summer and fall, as fly populations are peaking.

Max.force ant gel bait Bayer Environmental Fipronil 432-1264

Similar to the other baits, this bait can be applied virtually anywhere there's ants.

As stated earlier, all treatments on campus are on an 'as needed basis' and only as a last resort. All consideration will be made before any treatments are performed.