Colorado State University Integrated Pest Management Manual

Environmental Health Services

Facilities Management

April 2021

INTRODUCTION AND CONTEXT

Definitions

Integrated Pest Management, or IPM - A process you can use to solve pest problems while minimizing risks to people and the environment. IPM can be used to manage all kinds of pests anywhere–in urban, agricultural, and wildland or natural areas.

Pest - Pests are organisms that damage or interfere with desirable plants in our fields and orchards, landscapes, or wildlands, or damage homes or other structures. Pests also include organisms that impact human or animal health. Pests may transmit disease or may be just a nuisance. A pest can be a plant (weed), vertebrate (bird, rodent, or other mammal), invertebrate (insect, tick, mite, or snail), nematode, pathogen (bacteria, virus, or fungus) that causes disease, or other unwanted organism that may harm water quality, animal life, or other parts of the ecosystem.

Purpose

An Integrated Pest Management Program (IPM) is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and nontarget organisms, and the environment.

The use of pesticides is essential in modern society. However, their indiscriminate use can be hazardous to people and the environment. CSU uses this IPM in its grounds management, interior buildings, service programs and in laboratory/clinical activities.

CSU does not end at the borders of the Fort Collins campuses. In fact, the CSU community reaches far beyond to many urban, agricultural and natural areas within the larger Fort Collins area and beyond. Under this domain, these areas follow the same IPM plan as the main campus, ensuring that the values which act to protect both plants and people extend well beyond the borders of the Main Campus.

Main, south and foothills campus, not other campuses, follow state and federal regulations, contact extension services.

Benefits

An IPM program can reduce the number of pests, reduce the number of pest control applications and saves money while protecting human health. It provides an opportunity to create a safer learning environment, reduce exposure to pest control chemicals as well as eliminate pests. This program prescribes common sense strategies to reduce sources of food, water, and shelter for pests in buildings and on grounds. Put simply, IPM is a safer and usually less costly option for effective pest management in the community.

Health Benefits

Adopting IPM reduces exposure to both pests and pest control chemicals. Two health concerns faced throughout the country by children and adults are allergies and asthma. Rodents, cockroaches, and dust mites are often present in buildings and can cause or inflame serious allergic reactions and asthma attacks.

While pesticides can play a key role in IPM programs, by their very nature most pest control chemicals pose some risk. They are powerful tools for controlling pests but need to be used carefully and judiciously.

Economic Considerations

There are cost savings associated with using IPM. An IPM may be more labor intensive than conventional pest control and may require more up-front resources. However, costs are generally lower over time because the underlying cause of the pest problem has been addressed. IPM practices also provide financial benefits unrelated to pests. For example, weatherization of buildings not only excludes pests but also saves energy and reduces moisture problems.

RIGHTS AND RESPONSIBILITIES

Employees, students and others who work in pest management duties have the right to be informed about the potential health hazards in their work and to be properly trained to work safely. Employees have the right to file a complaint with CSU if they feel they are being exposed to unsafe or unhealthy work conditions and cannot be discharged, suspended, or otherwise disciplined by their employer for filing a complaint or exercising these rights.

Responsibility for the health and safety of the campus community extends to the highest administrative levels of CSU. The President and Provost and Executive Vice President are responsible for the implementation of CSU's Health and Safety Policy at all facilities and properties under University control. Deans and department heads are responsible for establishing and maintaining programs in their areas and for providing a safe and healthy work environment.

While the President, Provost and Executive Vice President, and the Deans and Departments Heads are responsible for the broad implementation and enforcement of CSU's Health and Safety Policy, the day-to-day responsibility for the management of pest management safety and adherence to safe practices rests with the PI/Delegate/Supervisors within individual units and associated departments. All personnel, including PIs/Delegates/Supervisors, employees, and students have a duty to fulfill their obligations with respect to maintaining a safe work environment and a culture of safety.

Building occupants are responsible for contacting their building proctor if pest issues are considered an issue in their area. If pests are observed in an occupied space, it is the responsibility of the building proctor to notify the occupants of the pest. FM representatives will contact the pest control vendor to inspect the situation and determine whether the regular action threshold or the emergency action threshold has been met. The spray technicians/contractor will then take the appropriate actions.

Responsibilities of Principal Investigators, Delegates, Supervisors or Responsible Party

These individuals have the responsibility for the health and safety of all personnel working in their areas. Safety duties may be delegated, but the PI/Delegate/Supervisor/Responsible Party remains responsible for ensuring that safety duties are adequately performed. Responsibilities include:

1) Knowing all applicable health and safety rules and regulations, training and reporting requirements and best management practices;
2) Identifying hazardous conditions or operations, determining safe procedures and controls and implementing and enforcing standard safety procedures;
3) Establishing standard safety operating procedures (general and protocol specific) and performing literature searches relevant to health and safety for specific work;
4) Consulting with the Pest Management Advisory Group (PMAG) on use of higher risk materials or conducting higher risk experimental procedures so that special safety precautions may be taken;
5) Ensuring personnel under their supervision have access to and are familiar with the appropriate safety manual(s);
6) Training all personnel they supervise to work safely and maintain records of training. Electronic records of training are encouraged. Training must include information of the location and availability of hazard information;
7) Promptly notifying EHS and/or Facilities Management should they become aware that workplace engineering controls and safety equipment become non-operational;
8) Notifying FM or EHS of pest issues;
9) Ensuring the availability of all appropriate personal protective equipment (PPE) and ensuring the PPE is maintained in working order;
10) Promptly reporting accidents and injuries to EHS and Risk Management and Insurance (RMI);
11) Providing funding for medical surveillance and/or medical consultation and examination for laboratory and other personnel, if required;
12) Providing funding in support of required security measures;
13) Informing facilities personnel, other non-laboratory personnel and any outside contractors of potential hazards when they are required to work in the impacted environment;
14) Identifying and minimizing potential hazards to provide a safe environment for repairs and renovations; and
15) Decontamination of facilities and equipment no longer used and before a facility is turned over to another individual.
16) Veterinary use of pesticides is limited to that prescribed by and under the supervision of a licensed veterinarian. The veterinarian–in-charge is responsible for protecting both people and the environment during such use.

Pest Management Advisory Group

A Pest Management Advisory Group (PMAG) shall be established to act as the approving authority for pest management at CSU.

1. **Composition:** The Pest Management Group shall be composed of individuals that are performing IPM duties and/or for their specific knowledge related to the CSU IPM.
    - CSU Outdoor Services Manager, Facilities Management (FM)
    - CSU Campus Planner, FM

- Campus Spray Technician, CSU Outdoor Services, FM
- Director of Environmental Health Services (EHS)
- Public Health Administrator, EHS
- Agricultural Biology Faculty Representative
- On Call Pest Control Vendor

2. The group shall review and update this manual, which is in accord with all Federal and State regulations, as well as local policies. This manual shall be approved by the PMAG and be binding for use of pest management by CSU personnel and/or contractors.

Pest management at CSU is under the general direction of the PMAG with the following exceptions:

1. Small quantities of chemicals registered by EPA for residential use providing that no more than one container of a type is kept/used in any one area.
2. The use of chemicals directed by health authorities to control the spread of disease.
3. The use of chemicals in research where the thrust of the research is to determine chemical, physical or physiological properties of the chemical. This shall be under the control of the Chemical Safety Committee (CSC).

The following pest management may be permitted for CSU activities and facilities with approval of the Pest Management Advisory Group:

1) Insect, rodent and other public health vector control purposes. NOTE: This includes their use in residences, playgrounds and other occupied areas (offices, etc.) after prior notification to occupants.
2) Agriculture use in fields, nurseries, greenhouses and related structures, ponds and forests.
3) Academic, research or clinical purposes.
4) Grounds maintenance and the preservation of ornamental plants.

The PMAG is primarily responsible for pesticide control within CSU activities. The CSC may, if necessary, restrict the PMAG when necessary for regulatory control purposes or preempt its management of any activity for health and safety purposes.

The PMAG may only approve “banned”, “experimental”, and/or “restricted use” pest management upon receipt of information appropriate to a specific activity after necessary clearances are received from applicable regulatory agencies.

An emergency panel may be authorized by the Public Safety Team (PST) to take actions during emergency situations. The panel shall consist of at least three selected members of the PMAG appropriate to the situation. The panel must report its actions to the Emergency Operations Center (EOC) as directed.

IPM Coordinator

Provide oversight of the activities of the program. The IPM coordinator will report to the Outdoor Services Manager. The coordinator will be trained in the principles of Integrated Pest Management, pesticide safety, pest control contract oversight, record keeping, and pesticide regulations. The US EPA recommends a minimum of six (6) to eight (8) contact hours of training annually from competent state, extension, or other agencies. The IPM coordinator is also the key advisor to the committee charged with pest management.

Process

IPM is not a single pest control method but rather involves integrating multiple control methods based on site information. While each situation is different, six major components are common to all IPM programs:

1. **Pest Identification**

Accurate identification is necessary to make the following decisions.

2. **Monitoring and Assessing Pest Numbers and Damage**

Monitoring means checking your field, landscape, forest, or building, or other site, to identify which pests are present, how many there are, or what damage they've caused. Correctly identifying the pest is key to knowing whether a pest is likely to become a problem and determining the best management strategy.

After monitoring and considering information about the pest, its biology, and environmental factors, you can decide whether the pest can be tolerated or whether it is a problem that warrants control. If control is needed, this information also helps you select the most effective management methods and the best time to use them.

3. **Action Thresholds - Guidelines for When Management Action is Needed**

The most effective, long-term way to manage pests is by using a combination of methods that work better together than separately. Setting an action threshold (plant health care standards; nuisance; emergency such as health hazard or economic hazard) is critical to guiding pest control decisions. A defined threshold will focus the size, scope, and intensity of an IPM plan. Once this has been exceeded, the responsible party needs to be contacted to determine follow-up procedures.

4. **Preventing Pest Problems**

With IPM, you take actions to keep pests from becoming a problem, such as by maintaining a healthy landscape that can withstand pest attacks, using disease-resistant plants, or caulking cracks to keep insects or rodents from entering a building or removing conditions that attract pests, such as food, water, and shelter. These actions may include:

a. Reducing clutter.
b. Sealing areas where pests enter the building (weatherization).
c. Removing trash and overgrown vegetation.
d. Maintaining clean dining and food storage areas.
e. Installing pest barriers.
f. Removing standing water.
g. Using appropriate irrigation and fertilization practices.
h. Maintaining mowing and pruning best practices.
i. Educating building occupants on IPM.

Rather than simply eliminating the pests you see right now, using IPM means you will look at environmental factors that affect the pest and its ability to thrive and vulnerable areas. Armed with this information, you can create conditions that are unfavorable for the pest.

5. **Control: Using a Combination of Biological, Cultural, Physical/Mechanical and Chemical Management Tools**

Approaches for managing pests are often grouped in the following categories.

Biological Control

Biological control is the use of natural enemies—predators, parasites, pathogens, and competitors to control pests and their damage. Invertebrates, plant pathogens, nematodes, weeds, and vertebrates have many natural enemies.

Cultural Controls

Cultural controls are practices that reduce pest establishment, reproduction, dispersal, and survival. For example, changing irrigation practices can reduce pest problems, since too much water can increase root disease and weeds.

Mechanical and Physical Controls

Mechanical and physical controls kill a pest directly, block pests out, or make the environment unsuitable. Traps for rodents are examples of mechanical control. Physical controls include mulches for weed management, steam sterilization of the soil for disease management, cold treatments or barriers such as screens to keep birds or insects out.

Chemical Control

All pesticide storage, transportation, and application will be conducted in accordance with the requirements of the Federal Insecticide, Fungicide, and Rodenticide Act (7 United States Code136 et seq.), Environmental Protection Agency regulations in 40 CFR, Occupational Safety and Health Administration regulations, Colorado State University policies and procedures, and local ordinances.

Chemical control is the use of pesticides. In IPM, pesticides are used only when needed and in combination with other approaches for more effective, long-term control. Pesticides are selected and applied in a way that minimizes their possible harm to people, nontarget organisms and the environment. With IPM you'll use the most selective pesticide that will do the job and be the safest for other organisms and for air, soil, and water quality; use pesticides in bait stations rather than sprays; or spot-spray a few weeds instead of an entire area.

Least toxic pesticides are preferred. Products that are not regulated as pesticides by the EPA because they primarily contain low-risk ingredients can be used with the approval of the advisory group.

Pesticide application notification

Interior Notifications: The overall responsible party will notify the tenant contacts via email of the pesticide application, including the pesticide name, the EPA registration number, the treatment location, and the date of the application. The tenant contacts are then responsible for distributing the notification to the occupants in their space. In addition, the overall responsible party will post a sign at the application site, such that an occupant reading the sign can choose to avoid the application area (for example, if the pesticide is applied in a break room, all entrances to the break room shall have a sign posted). The sign will also include the pesticide name, the EPA registration number, the treatment location, and the date of the application.

Exterior Notifications: Spot spraying of herbicides and insecticides is not required. Broadcast treatments of herbicides and insecticides require minimum of one day notification. Notification markers will be placed according to EPA standards.

a. Send out notices to surrounding buildings via building proctors
    i. Sign notifications of sprayed areas
b. Flags will be posted in treated areas according to EPA standards.

6. After Action Assessment of the Effect of Pest Management

One of the fundamentals of the CSU IPM is a strong commitment to the continued evaluation of the plan. Focuses include proper training, up to date licensing and continued educational opportunities. CSU maintains its commitment it has made to service the university.

a. Maintain records for locations monitored, inspections, follow-ups and pest controls implemented using the five components above for three (3) years.
b. Consideration of non-chemical control methods.
c. Evaluate the efficacy of prevention and control methods.

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

- Pest type and name
- Pest population density and monitoring frequency
- Pest action threshold observed
- Prevention measures implemented
- Product applied (name)
- 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 in the IPM tracking tool. The Spray Technician 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 applicable individuals as necessary in order to appropriately adjust the action thresholds.

CAMPUSES

Overall Strategy

The CSU IPM for campuses outlines best practices and management strategies aimed at the prevention and treatment of pest infestations on campus. The following strategies have been approved and directed by Facilities Management (FM) Operations. The plan applies to the exterior sections of campus, and its inclusive areas. The primary objective of the CSU IPM is to use herbicides and pesticides in their proper method of application and only when no other reasonable solution is present.

CSU also works in cooperation with the College of Agricultural Sciences & Department of Agricultural Biology to define and determine best practices for the state. The research and

development that takes place on the campuses plays a crucial role in the development of CSU policies including this IPM.

IPM goals for CSU campuses include:

1. Maintaining a safe environment for the campus community, both plants and people.
2. Promoting a cooperative and beneficial campus ecosystem.
3. Upholding the high-quality aesthetics of the campus exterior environment.
4. Promoting best practices to minimize potential negative impacts to the surrounding atmosphere and environment including:
    a. Aquatic life, terrestrial life, atmospheric spaces, ecosystems and habitats.
5. Encouraging continued education and training both interdepartmentally and throughout campus as a whole.
6. Continued evaluation of the IPM programs success and effectiveness.

Outdoor Areas

Zones

The CSU campus terrain is extremely diverse. Therefore, the campus and surrounding areas have been divided into zones which are then assigned to a State Classified individual who adopts the responsibility of caring for and frequently monitoring their assigned zone. Zone leads become extremely familiar with the diverse micro-ecosystem of their designated area and are skilled in both preventative and management methods.

Organic Areas

CSU Facilities Management has designated several areas within its Man Campus territory to be organic spaces. These areas employ a myriad of non-chemical. Permaculture based methods of pest and disease control.

Aquatic

CSU has limited areas of aquatic management, including College Lake, West Lawn Lagoon, and VTH pond, applying best management practices in an effort to minimize the application of non-organic control measures.

Pest Identification

Noxious Weeds

CSU and the larger Fort Collins community is mandated through the Colorado State Noxious Weed Act to comply with regulations that mandate the removal and eradication of certain species of herbaceous life. Specifically, plants that have been designated as invasive, which are competitive enough to cause a decline in native or desirable plants. In accordance with local and state regulations, CSU must comply with the eradication of those weeds. More information on this can be found in the resources section under Colorado Department of Agriculture's 'Noxious Weed Species'.

Insects

Pesticide application is restricted to known pests on the CSU campuses or adjacent properties. Identification of these known pests are performed by the CSU responsible party.

Monitoring and assessing Pest Numbers and Damage

CSU employs frequent monitoring of outdoor campus spaces performed by the Outdoor Services group.

Action Thresholds

Trained spray technicians are the responsible parties for determining action thresholds in outdoor areas.

Preventing Pest Problems

- Plant free zones at critical research buildings.
- Soil amendments are performed with materials that are solicited as weed free.
- Pest habitats are mitigated through:
    - The design and maintenance of landscape features to discourage pest habitat creation.
    - The promotion of clutter free spaces, mitigating trash and overgrown vegetation.
    - The elimination of standing water.
- Irrigation and supplemental watering are administered properly and in the appropriate amount.
- The use of fertilizer is targeted.
- Negative spaces in landscapes are covered with fillers such as mulch and rock to promote percolation of water, while also discouraging the growth and germination of weed seeds.
- Landscape design is accomplished through a “right plant right place” mentality to encourage healthy plant growth and discourage the spread of infestation and disease.

Biological, Cultural, Physical/Mechanical and Chemical Management Tools

Biological

CSU has/does utilize strategic insect release programs to combat issues surrounding pest and disease management. Several different types of “beneficial insects” including beetles and ladybugs have been involved in this program. CSU continues to work with academics and extension to trial unique treatment methods.

Cultural

No feeding wild animals on CSU campuses. Feeding animals attracts the animals to the building and increases the population. They also become dependent on human handouts.

Physical/Mechanical

Noxious Weeds

Noxious weeds are removed mechanically using tools and hands. When appropriate, physical barriers are installed to mitigate weed growth in landscaped areas.

Pests

Bee swarms are common in February through the spring. Nuisance bees, wasps or hornets should contact Environmental Health Services (EHS). Actions include:

- Chemical applications for wasps and hornets
- Removal of bee swarms by beekeepers

Pests will be removed either in live traps using non-chemical baits (raccoons, skunks, etc.), capture and release in an area approved by the city or on an approved CSU land area (squirrels, snakes, birds etc.) or contacting an animal removal contractor (Humane Society, Colorado Game and Fish, approved independent company).

Bait traps will use non-chemical means to attract the pest. If these type of traps do not reduce the population below action levels then bait traps with block pesticides internal to the trap will be used. These will be checked on a routine basis and removed/replaced as necessary.

Chemicals

- Before chemical applications are performed, trained spray technicians offer recommendations for alternative control methods based on their specific zone.
- Trained spray technicians maintain calibration of spray equipment to ensure the proper amount of chemicals are used relative to the labeling on the chemical being applied.
- Chemicals are stored according to labeled instructions and EPA standards and in their original containers.
- Chemical transfers are in approved containers and are labeled according to OSHA regulations.
- Contractor Services:
    - Substances are retained at the contractor facilities.
    - Contractors are trained on this IPM and adhere to the plan procedures.
- Residual material of approved use substances are cleaned in a timely manner by trained technicians to mitigate exposures to humans, animals and the environment.
- Runoff and drift management is mitigated by delaying applications in the following weather conditions:
    - Wind speed > 7 mph
    - Precipitation is predicted within 1-5 hours of application
    - Temperature falls outside the realm of 50F-90F
- Chemical disposals:
    - Containers are triple rinsed and disposed appropriately.
    - Container reuse if used for comparable chemicals.
    - Storage in cool dry areas.
    - Chemicals are used by the use-by date or disposed through the CSU chemical waste system in EHS.

Pesticide selection and application is determined according to the following factors:

- Functional use classification of the affected area
- Toxicity and exposure evaluation
- Impact to people, property or significant environmental or economic damage.

Approved Pesticides

Product	Threshold	Type of Product	Active Ingredient	Application Method	Frequency	Timing and Location	Responsible Party
Leptect soil injection: Elm Scale		Pesticide	Orthene	Soil Injection	Yearly Application	July. Elm trees across campuses.	Outdoor Services: Arborist
Distance Spray: Elm Scale		Pesticide: Growth regulator	Pyripoxyfen. 11.23%	Spray	Yearly	July Elm trees across campuses.	Contracted to Licensed Arborists
Aerosol wasp spray		Pesticide	Pyrethroids	Spray: Individual direct treatement for wasp nests.	Kept on hand for safety issues as they arise.	Early morning or late evening. Individual treatment	Outdoor Services Trained Technicians

Approved Herbicides

Product	Threshold	Type of Product	Active Ingredient	Application Method	Frequency	Timing and Location	Responsible Party
Sucker Stopper		Herbicide (Growth Regulator)	Ethyl 1-Naphthal eneacetate 1.15%	Spray	As needed during summer months.	Base of trees across campus.	Outdoor Services Trained Technicians
Snap Shot		Herbicide (Pre-emergent)	Isoxaben 0.5% TriFluralin 2%	Granular Spreader	March/April before moisture.	Accessible weedy areas.	Outdoor Services Trained Technicians

Product	Threshold	Type of Product	Active Ingredient	Application Method	Frequency	Timing and Location	Responsible Party
Round-up		Herbicide	Glyphosate	Spray	March-October as needed.	March-October as needed.	March-October as needed.
2 4-D		Herbicide	Dichlorophenoxyacetic acid	Spray (Mix with round-up 2 % solution)	March-October as needed.	March-October as needed.	March-October as needed.

After Action Assessment

CSU Outdoor Services retains year-round spray technicians whose primary oversight is the management of chemical spray programs. Record keeping is an essential component of this position. When the existence of a pest or disease has been identified, the spray technician keeps diligent notes of the following:

- Location
- Population (spread) size
- Management strategies employed including:
    - Type and quantity
    - Time, date, location and climatic considerations
- Outcome of the pest management strategy
- Prevention and other non-chemical methods of control.

Indoor Areas

Application Notification

Informing the occupants, public, responsible party? Make a form to send out? Postings in the area?

The overall responsible party will notify the tenant contacts via email of the pesticide application, including the pesticide name, the EPA registration number, the treatment location, and the date of the application. The tenant contacts are then responsible for distributing the notification to the occupants in their space. In addition, the overall responsible party will post a sign at the application site, such that an occupant reading the sign can choose to avoid the application area (for example, if the pesticide is applied in a break room, all entrances to the break room shall have a sign posted). The sign will also include the pesticide name, the EPA registration number, the treatment location, and the date of the application.

Pest	Action Threshold	Response
Ants	Nuisance	Regular treatment will be performed if any ants are noted in the building and their presence is confirmed through monitoring.
Ants	Emergency	Emergency treatment may be used if there are ten or more reported cases or complaints of ants within a two-day period OR in any space where food is stored/prepared.
Other Indoor Insects	Nuisance	Regular treatment will be performed if any insects are noted in the building and their presence is confirmed through monitoring.

Pest	Action Threshold	Response
Other Indoor Insects	Emergency	Emergency treatment may be used if there are ten or more reported cases or complaints of insects within a two-day period OR in any space where food is stored/prepared.
Cockroaches	Nuisance	Regular treatment will be performed if cockroaches are noted in the building and their presence is confirmed through monitoring.
Cockroaches	Emergency	Emergency treatment may be used if the presence of cockroaches is confirmed in two different spaces within the building OR if the presence of a large population of cockroaches is confirmed in one space in the building OR in any space where food is stored/prepared.
Rat, Mouse	Nuisance	Regular treatment will be performed if rats or mice are noted in the building and their presence is confirmed through monitoring.
Rat, Mouse	Emergency	Emergency treatment may be used if the presence of rats or mice is confirmed in two or more different spaces within the building OR in any space where food is stored/prepared.
Bed Bugs	Nuisance	None
Bed Bugs	Emergency	Emergency treatment may be used if the presence of bedbugs is confirmed in the building.
Bats	Nuisance	None
Bats	Emergency	Emergency treatment may be used if the presence of bats is confirmed in the building.
Other Occasional Invaders	Nuisance	Regular treatment will be performed if rats or mice are noted in the building and their presence is confirmed through monitoring.
Other Occasional Invaders	Emergency	Emergency treatment may be used if the presence of bedbugs is confirmed in the building.

Preventing Pest Problems

Biological, Cultural, Physical/Mechanical and Chemical Management Tools

Biological

Cultural

- Reporting problems with water leaks and penetrations.
- Housekeeping is an important part for IPM. Shelters are created in disorderly locations, open water (water features) and food in computer keyboards on desks and floors invite animals into the area.

Physical/Mechanical

- Timing of repairs depends on the type of pest.
    - Sealing penetrations in buildings for bats will be performed after they migrate south or before they migrate back in the spring.
    - Sealing for other pests will occur after attempting to remove the pests either in live traps using non-chemical baits (raccoons, skunks, etc.), capture and release outside (squirrels, snakes, birds etc.) or contacting an animal removal contractor (Humane Society, Colorado Game and Fish, approved independent company). Sometimes this cannot be performed because some pests like mice and ants continue to enter buildings during the penetration process and many individuals are frightened of these types of pests and they need to be removed immediately.
    - Contractors are trained on this IPM and adhere to the plan procedures.
    - Bait traps will use non-chemical means to attract the pest. If these type of traps do not reduce the population below action levels then bait traps with block pesticides internal to the trap will be used. These will be checked on a routine basis and removed/replaced as necessary.

Chemicals

Products that are not regulated as pesticides by the EPA because they primarily contain low-risk ingredients, such as garlic oil, may also be considered for use.

Non-least toxic pesticides include all chemical rodent baits and any product that meets the Tier 1 or 2 criteria according to the San Francisco Hazard Review Process. Non-least toxic pesticides may only be used under the following circumstances:

EDUCATION

Training and education of personnel are essential to a successful pesticide safety and IPM program. The US EPA recommends that staff, students, and the general public receive appropriate education on the subject and program, as well as their responsibilities to the program and how their actions determine success or failure. Such training and education build a culture of a pest-free environment and leads to sustainability of the program beyond the presence of a single individual or office.

As stated previously, trained pesticide applicators require specific training related to pest, pesticides, and approaches, but all others require training and education specific to the impact their individual activities have on successful pest management.

- All CSU custodial, food service, and Grounds staff should be trained a minimum of one (1) hour annually on the components of IPM and how their efforts toward sanitation impact pest infestations.
- Facilities Management relevant personnel should be trained a minimum of one (1) hour annually on the components of IPM and how their efforts to sealing the building envelope and repairing water leaks impact pest infestations.
- The CSU community and the general public should be provided direct and supplemental education/information on program via web, and how they contribute to success of the program.

Spray Applicators

There are three levels of Spray Applicators: qualified supervisors, certified operators, and trained spray technicians. Trained in the principles and guidelines of this IPM and are required to participate in ongoing education courses on pest and disease management. Provide additional training to employees that assist in treatment operations.

Qualified Supervisor

- Obtains and maintains Commercial Pesticide Applicator certification.
- Ensures documentation, operations, and regulations are followed by the Certified Operators and Trained Spray Technicians.

Certified Operator

- Obtains and maintains Commercial Pesticide Applicator certification.

Trained Spray Technician

- Receives 16 hours of training annually.

RESOURCES

Colorado Center for Integrated Pest Management

US Environmental Protection Agency – Pesticide Registration and Classification Procedures (FR 53)

Colorado Department of Agriculture's 'Noxious Weed Species'

TRACKING FORM

IPM Coordinator: _____ Date: _____

Campus-Wide Plan: ☐ Yes ☐ No If No, Campus Zone/Location: _____

Latest Update: _____

Problem/Concern:
• Pest type and name
• Pest population density and monitoring frequency
• Population (spread) size:
• Pest action threshold observed
Objectives:
Informational Resources
Management Strategies:
• Prevention and other non-chemical methods of control.
• Emergency application? (Y/N). If yes, an explanation of the emergency will be included.
• Prevention measures implemented
• Product applied (name)

• Toxicity of the product (the tier level as determined by the San Francisco Hazard Review Process)
• Quantity applied
• Date and time of product application (if applicable)
• Climatic considerations
• Date and time of occupant notification (if applicable)
Outcome of the pest management strategy

ACKNOWLEDGEMENT OF REVIEW AND UNDERSTANDING OF IPM MANUAL

I have read and understand this IPM Manual and will follow this manual while working on the main, south and foothills CSU campuses.

Printed Name	Signature	Representative Company	Date