Santa Clara University's
INTEGRATED PEST MANAGEMENT PLAN
2019

Santa Clara University

EHS
ENVIRONMENT HEALTH & SAFETY
SANTA CLARA UNIVERSITY

mission sustainable

Commitment to Our Landscape

This **Integrated Pest Management (IPM) Plan** provides comprehensive guidelines for protecting and enhancing the natural diversity of the campus landscape at Santa Clara University (SCU). The landscape is an important asset for SCU, creating a vibrant environment for all students, faculty, and staff. It is also one of the largest selling points for prospective students and their families, so our Facilities department aims to protect this space and prevent hazardous environmental and health effects.

This plan informs Facilities and Operations workers about IPM principles and implementation methods, focusing on pest (including insects, animals, invasive plants, and fungi) prevention and management. This Plan describes policies, procedures, equipment, personal protective equipment, and work practices to ensure its success.

This plan applies to all uses of and exposures to chemicals, especially, pesticides, at SCU, with the exception of laboratory use of disinfectants and other registered pesticides. Laboratory uses of pesticides as sanitizers are addressed in the Chemical Hygiene Plan.

The finalization and adoption of this plan embodies SCU's commitment to provide a **healthy and sustainable learning environment** to all members of the campus community.

UN Sustainability Development Goals (Source: United Nations)

Program Review and Revision

Program Review Record

Name	Title	Department
Chris Young	Associate Director Grounds and Maintenance	Facilities
Dave Mathe	EHS Manager	EHS Department
Gary Vargas	Grounds Maintenance Supervisor	Facilities
Lindsey Kalkbrenner	Director	Center for Sustainability
James Wang	Buildings & Grounds Intern	Center for Sustainability

Program Approval

Signature on file in the EHS Office	*04/12/2019*
Signature	**Date**
Sean P. Collins Director – Environment, Health and Safety (EHS) Department	

Revision History

No.	Date	Responsible Person	Revision
4	01/14/2019	James Wang	Creation of IPM Plan V1
3	04/11/2018	Dave Mathe	Review Appendix A
2	05/16/2017	Dave Mathe	Review Appendix A
1	07/13/2015	Dave Mathe	Update Appendix A
New	07/26/2010	Joe Sugg	New

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Mission and Goals

Mission

Our mission is to create an **organic farming landscaping practice** across campus, using this IPM Plan to jumpstart this transitional process. This Plan aims to minimize the use of chemicals, especially pesticides, in order to protect human, horticultural, and environmental health, creating safe, healthy, and eco-friendly campus grounds. These methods will also allow for the economical management of pests, fiscally sustaining our future.

Goals

1. Improve pest management methods by employing alternative mitigation approaches (physical, biological, mechanical) rather than chemical.

2. Mitigate harmful environmental and health hazards due to chemical exposure.

3. Prevent environmental contamination from the use of pesticides and chemicals.

4. Ensure compliance with applicable federal, state, and local requirements.

5. Respond to exposure-related emergencies.

6. Educate and train the campus community about better methods for pest control.

Roles and Responsibilities

Roles and responsibilities in regards to implementation of the pesticide plan:

Group	**Responsibilities**
Director, Facilities	• Assign responsibility for pesticide and chemical compliance in the Facilities department
Assistant Director of Buildings and Grounds AND Grounds Maintenance Supervisor	• Work with the EHS Dept to develop a list of approved chemicals • Ensure the current approved chemicals list is available and is adhered to by staff and vendors • Ensure that employees and vendors utilize chemicals according to their current labels and applicable regulations • Provide staff with appropriate safety equipment and ensure that it is used in all required circumstances • Maintain use records and submit reports as required • Assist with a periodic review of the possession and use of pesticides to ensure compliance with regulatory requirements
EHS Dept	• Work with the Associate Director, Facilities to develop a list of pesticides approval • Review pesticide labels and Material Safety Data Sheets (MSDS) and identify appropriate personal protective equipment • Ensure the availability and presentation of training for employees in the safe use of pesticides • Ensures that this Plan is up-to-date with regulatory requirements • Performs an annual review of the effectiveness of the Plan
Center for Sustainability	• Updates IPM plan to ensure that all information is up-to-date and that expectations and goals are being met • Reviews the plan periodically with members of EHS and Facilities to make changes as needed • Ensures sustainability criteria are addressed to promote a healthy environment for all people on campus
Pesticide Users	• Use chemicals in accordance with label and this program • Use and maintain personal protective equipment in accordance with the manufacturer's instructions

Approach Summary

Of our 118.92 acres of campus, 31.88 acres, or 26.8% are considered to be vegetated lands. The landscaping team establishes tolerance and maintenance levels for pests depending on the the priority and aesthetics of each area, tailoring different strategies for each location. Overall, the plan follows a five-step process of identification, prevention, monitoring, detection/evaluation, and response, which will be detailed on the next page.

Our team prioritizes natural, cultural, manual, and mechanical practices over the use of chemicals, which are used sparingly and as a last resort. Early monitoring for pests and responding rapidly reduce the need for heavy chemical use. Most of our chemical methods are applied only as needed, not by schedule. This *need* is determined by visual inspections or online reports, indicating the large presence of pests, and will be evaluated on a case-to-case basis.

Even prior to execution and use of chemicals, all applicators must submit proposed pest management activities to the **Grounds Maintenance Supervisor**. His role is to approve or deny certain actions to ensure compliance with the IPM Plan.

When chemicals are necessary, the Facilities department takes great care in the method, location, and rate of application to minimize the risk of non-target contamination via runoff or drift. However, SCU does not contain, nor is directly adjacent, to any in-stream habitat, wetland, or riparian areas located within campus boundaries. Furthermore, all chemicals used must be registered with the U.S. Environmental Protection Agency, state and or local jurisdiction and comply with San Francisco's Tier 3 hazard criteria for a less toxic pesticide.

Lastly, all of the gardeners who apply these techniques are trained in Integrated Pest Management techniques. These trainings, along with other mitigation measures, such as proper equipment and clothing, prevent harm to the pesticide applicator if chemicals are deemed necessary.

Steps of Integrated Pest Management

Based on the steps laid out by the Environmental Protection Agency (EPA), we follow five steps towards pest reduction:

1. **Identification**: Determine which species are pests in a given area, tolerance levels, and potential mitigation strategies for each pest species.

2. **Prevention**: Increase plant spacing and pruning through proper gardening to lead to healthier plants and reduce the presence of pests.

3. **Monitoring**: Keep an estimate of pest populations for each area and compare to established thresholds each month. Other criteria considered are damage severity, site characteristics, usage, and health concerns. Depending on the location, this may be done daily, weekly, or monthly. Reports from students, faculty, and staff will lead to closer inspection, else monitoring will be done by gardeners who tend to the landscape.

4. **Detection/Evaluation**: If pest populations exceed threshold or another factor has a larger impact, select appropriate tactic.

5. **Response**: Execute the proper course of action, prioritizing non-chemical approaches. Assess its effectiveness and continue monitoring the site. If chemicals must be used, the least-toxic pesticide with the desired results shall be used.

The above standards may not be followed in times of an extraordinarily high need for pest control or when normal procedures have failed to control the situation.

Chemical Approval Process

Pre-Use Review

Only pesticides on the pre-approved list, specified in *Appendix A*, shall be purchased at SCU.

Prior to purchasing/using non-approved chemicals, the following steps must be followed:

- The registration number must be reviewed to confirm that the pesticide is registered in California.
- The label must be reviewed to confirm that:
  - A respirator is not required.
  - The signal word is “Caution”.
- Restricted pesticides or chemicals requiring respirators and/or pesticides with the signal word “Warning” or “Danger” will not be approved.
- A change to this policy will require a change to this program and the implementation of the requirements of the respiratory protection program.
- A request must be submitted in writing to EHS requesting the review of any new pesticide. The request must include the name of the pesticide, proposed method and frequency of application and proposed safety precautions. The safety precautions must comply with the information in the label.
- The EHS Director or Manager will review the label, MSDS and other sources of information about the pesticide active ingredient(s) and formulation and approve or disapprove based on if the safety precautions provide appropriate protection.

Chemical Approval Process Continued

Hazard Communication

A copy of the label and MSDS for each pesticide will be maintained at the site. A copy of the Pesticide Safety Information Series leaflet N-8 “Hazard Communication Information for Employees Handling Pesticides in Noncrop Settings” will be posted in a public location in the Facilities Department.

Employees will be informed of the location and availability records and documents relating to employee training, monitoring, and potential exposure before they are allowed to handle pesticides, at least annually thereafter and upon changes in location.

Any pesticide container other than the original labeled container must be labeled with:

- Name and address of the person or firm responsible for the container,
- Name of the pesticide, and
- Signal word from the original container, e.g., “Caution.”

Chemical Pre-Application

Qualifications and Trainings

Before working with pesticides, SCU employees must receive training in pesticide safe handling procedures in accordance with the training program presented in *Appendix C*.

Only trained and qualified staff will mix, load or apply pesticides. Minors and students will not be hired for work involving pesticide mixing, loading or application.

Storage, Mixing, and Loading

Each registered pesticide must be stored, mixed, loaded and applied in accordance with the requirements of the pesticide label. The quantity of pesticide used will be the minimum amount needed for the specific pest control task.

Pest control equipment must be in good repair and safe to operate. The equipment used for mixing, loading, transferring, or applying pesticides must be inspected before each day of use and equipment with any safety defect must be removed from service and repaired or discarded. Repairs may only be performed by trained and authorized persons who have been informed by the SCU Facilities Department of the hazards of the pesticides and associated safety precautions.

Running water for hand washing and flushing of eyes must be provided in the mixing area. Concentrated pesticides which are to be mixed shall be weighed or measured accurately using devices which are calibrated to the smallest unit in which the pesticide is being weighed or measured.

All application equipment which is connected to a source of potable water such as a hose must have an air-gap separation permanently affixed to the equipment. Backpack type spray equipment and hand-held sprayers with a capacity 5 gallons or less are exempt. These may be filled by hand holding a hose over the tank. The hose must be held well above the tank at all times to prevent contact with the tank or its contents.

Chemical Pre-Application Continued

Personal Protective Equipment

Each SCU employee must at a minimum wear the following personal protective equipment (PPE) while mixing, loading or applying a pesticide:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves
- Shoes plus socks

Other PPE, such as safety glasses or a chemically resistant apron, must also be worn if required by the label. PPE must be inspected daily (before use) and cleaned after each use according to pesticide labeling instructions or, absent any instructions, washed in detergent and hot water. PPE must be must be dry before storage and stored in a designated pesticide-free location separate from personal clothing. The supervisor is responsible and accountable for assuring that all workers wear the required PPE, inspect it prior to use, and store it properly.

PPE must remain on the SCU campus unless authorized, e.g. sent to a designated laundry, and must not be taken home for laundering. Potentially contaminated personal protective equipment must be washed separately from other clothing or laundry.

Chemical Pre-Application Continued

Postings

The employee applying the pesticide is responsible for posting the area, as appropriate with signs and or barriers to notify people of the application, if such a requirement is noted on the label. He/she will also monitor the area until after the material has dried or the time limit for re-entry on the label has been satisfied. The notice must include the following information:

- The date of the scheduled application;
- The identity of the pesticide (including spray adjuvants, if applicable) by brand or common chemical name; and
- Precautions to be observed as printed on the pesticide product labeling or included in applicable laws or regulations related to the entry of the treated area.

Chemical Application

General Application Criteria

All approved chemicals are applied as needed. If chosen to be applied, workers ensure it is a direct, small stream application rather than broadcasting onto plants.

Applications will only be performed when weather and other conditions at the site permit the safe and proper application of the chemical. Chemicals will not be applied if there is the possibility of contamination of persons, clothing or other public or private property. The employee applying the chemical is responsible for consulting the wind sock or other source of wind information prior to application to confirm that weather conditions are acceptable.

Application of chemicals will occur according to the product label, but if certain conditions exist, then application of sprays will be delayed:

- Temperature above 85℉ or below 55℉
- Wind speeds above 8 mph
- Rainfall predicted within 4 hours or scheduled irrigation

Different chemicals have different application standards, so if a condition above does occur, landscape gardeners should check with Facilities and the EHS Manager before application.

Spraying

Tanks must be labeled with the name of the pesticide, the signal word (e.g., “Caution”) listed on the pesticide label, and the name and address of the SCU Facilities Department. After the tank is mixed, the measuring cup will be rinsed with water with the rinse water put back into the tank. The remaining concentrate must be stored in a safe manner while the application is proceeding.

The majority of spray application should occur early in the day, when plants absorb chemicals better, insects are more active, and the air is more still for personal protection. Moreover, since irrigation occurs mostly at night, this ensures chemicals can dry and prevent run-off.

Chemical Post-Application

Disposal

At the conclusion of the spraying, additional clean water will be added to the tank to flush the tank, pump, and hose. Then the rinse water will be sprayed onto the vegetation that was already sprayed. The application equipment and product will then be returned to safe storage.

The following steps will be followed to rinse each emptied container that has held less than 28 gallons of a liquid pesticide diluted for use:

- Use the following amount of water or other designated spray carrier for each rinse:

Size of Container	**Amount of Rinse Medium**
Less than 5 Gallons	1/4 Container Volume
5 Gallons or Over	1/5 Container Volume

- Place required minimum amount of rinse medium in the container, replace closure securely, and agitate.
- Drain rinse solution from container into tank mix. Allow container to drain 30 seconds after normal emptying.
- Repeat the above steps a minimum of two times so as to provide a total of three rinses OR use an equally effective approved method for triple rinsing containers.
- Render container unusable and discard in a sanitary landfill.

Cardboard containers will be completely emptied and discarded in the trash.

Pesticide containers will **never** be reused. Unused pesticide will be disposed of in accordance with the requirements of the SCU Hazardous and Universal Waste Program.

Chemical Post-Application

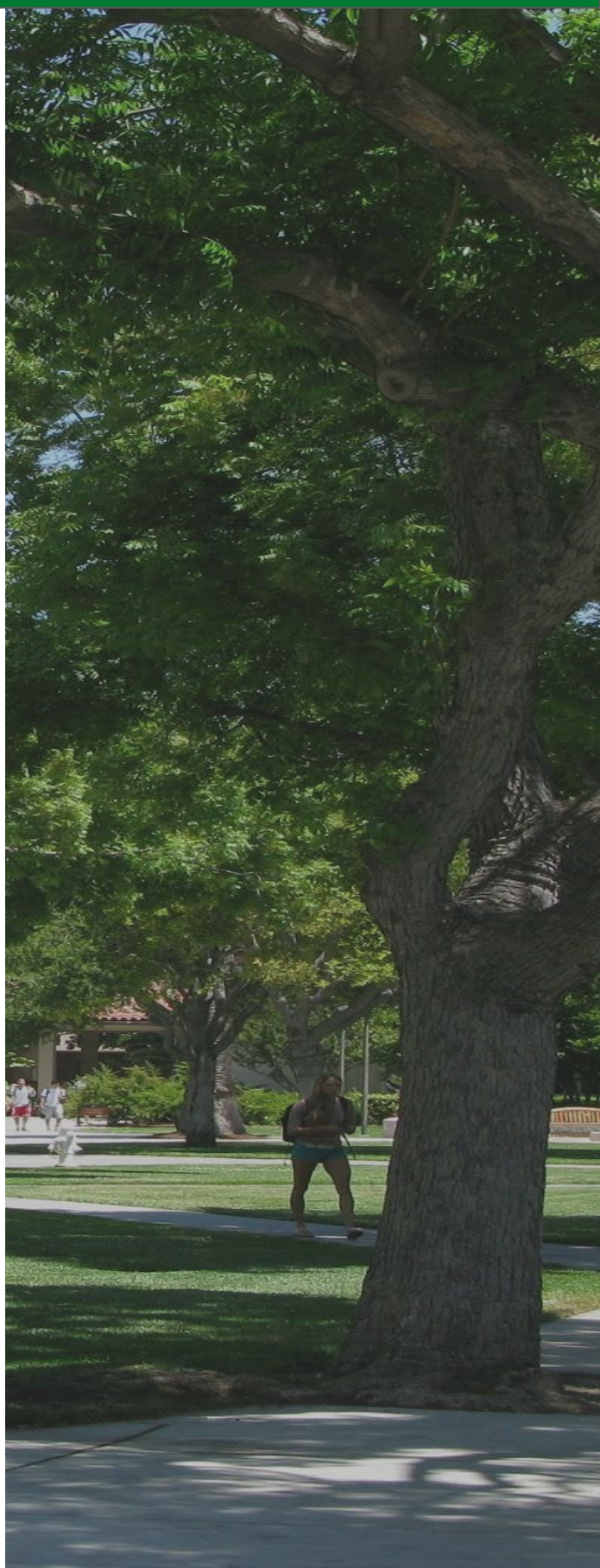
Storage

Pesticides must be stored in a secured, well ventilation location which is not accessible to unauthorized persons. Containers must be kept tightly closed when not in use.

Recordkeeping and Reporting

Application records must be maintained that include the following information for each pest control operation:

- Date and time of application;
- Name of the operator of the property treated;
- Location of property treated;
- Crop commodity, or site treated;
- Total acreage or units treated at the site;
- Purpose for application; and
- Pesticide, including the U.S. Environmental Protection Agency (U.S. EPA) or State registration number which is on the pesticide label, and amount used.



Emergency Medical Care

The source of emergency response information is the pesticide label. Emergency medical care will be arranged in advance by SCU. The name of the emergency medical provider will be communicated to employees on the “Hazard Communication Information for Employees Handling Pesticides in Noncrop Settings” poster.

The following steps will be followed in case of exposure/contamination to the employee applying the pesticide or to others:

- Call extension **408-554-4444** to report the exposure and request the assistance of the **EHS Director**. Report the name of the pesticide.
- Immediate first aid measures include:
  - If on skin, rinse skin with plenty of water for 15 – 20 minutes.
  - If on clothing, remove contaminated clothing.
  - If in eyes, hold eye open and rinse slowly and gently with water for 15 – 20 minutes.
- The EHS Director or EHS Manager will review the pesticide label to provide additional guidance.

Document Retention

To ensure the success of the plan, the responsible parties shall review the plan every three years or as needed for effectiveness by the EHS Department. Any changes in the Pesticide Program will be transmitted to impacted Facilities management, users and others in the department that need to be aware of the changes.

Each year, the approved list of fertilizers, herbicides, fungicides, and pesticides will be considered, especially taking into consideration new products in the market and/or concerns about specific chemicals.

Record	Location	Retention Period	Responsible Party
Integrated Pest Management Plan	EHS Files	Until Superseded	EHS Dept
Training Program	EHS Files	While in use and for two years after use, at a central location at the workplace	EHS Dept
Pesticide Use Records	Facilities Files	3 years	Facilities Director
Pesticide Disposal Records	EHS Files	Indefinitely	EHS Dept
Annual Pesticide Program Review	EHS Files	3 years	EHS Dept
Personal Training	EHS Training Record System	3 years after termination of employment	EHS Dept

For any questions or concerns, please contact the EHS manager,
Dave Mathe at dmathe@scu.edu

References & Acknowledgments

- Food & Agriculture Code Section 11401 et seq.
- 3 CCR 6000 et seq.
- SCU Hazardous and Universal Waste Program
- SCU Chemical Hygiene Plan
- Portland State IPM Plan
- Colgate University IPM Plan

All photos courtesy of University Media Communications

Appendix A: Approved List of Pesticides

Due to the campus's original Pesticide Program and regulations, we are only displaying a list of **pesticides** approved for Use at SCU. For other chemicals, one can refer to the other documentation or contact the EHS Manager.

REVIEWED: 04/10/2019

Name	Manufacturer	Active Ingredient	CAS Number	EPA Registration Number	California Registration Number	Signal Word
Merit® 75 WP Insecticide	Bayer	Imidacloprid	138261-41-3	432-1314	432-1318-AA	Caution
No Foam® B	Creative Marketing and Research	POE Nonylphenol Dodecylbenzene sulfonate Isopropyl Alcohol	26027-38-3 27176-87-0 67-63-0	Not required	CA-54705-50003-AA	Caution
Roundup ® Pro Herbicide	Monsanto	Isopropylamine salt of glyphosate	38641-94-0	524-475	524- 475-ZA	Caution
SedgeHammer™	Gowan Company	Halosulfuron-methyl	100784-20-1	81880-1-10163	81880-1-AA- 10163	Caution
Sluggo®	Lawn & Product	Iron Phosphate	product is a mixture —no specific CAS number	67702-3-54705	67702-3-AA- 54705	Caution
SPEED ZONE Broadleaf Herbicide for Turf	PBI/Gordon Company	Dicamba MCPP 2,4-D, 2-ethylhexyl ester	1918-00-9 16484-77-8 1928-43-4	2217-833	2217-833-AA	Caution
Surflan* AS Herbicide	Dow AgriSciences	Oryzalin	19044-88-3	62719-113	70506-43-AA	Caution
Suspend SC Insecticide	Bayer	Deltamethrin	52918-63-5	432-763	432- 763-ZB	Caution
Turflon Ester Herbicide	Dow AgriSciences	Tryclopyr	62719-258	64700-56-7	17545- 8-AA	Caution

Appendix B: List of Chemicals Used

All chemicals bought by the university must go through the EHS Manager, who **must** approve all purchases. Each chemical used on campus has its own Materials Safety Data Sheet (MSDS), which is a safely stored with the university's EHS manager

Approved Fertilizer	Frequency of Application	Area of Application
Nature Safe 27-0-2	At least once a year	All vegetated grounds
Triple 15	1-2 times a year after planting	Flower beds and shrubbery areas
Essential Plus 1-8-1	As needed	Impacted areas

Approved Herbicide	Frequency of Application	Area of Application
Roundup ® Pro Herbicide	Up to four times a year (manually applied)	Shrubbery and planter areas
Fusilade	Once a year	Shrubbery areas
SPEED ZONE Broadleaf Herbicide for Turf	Once a year (as needed in fall)	Impacted grass lawn areas
Turflon	Once a year (as needed in Spring/Summer)	Impacted grass lawn areas
Snapshot	Once a year (as needed)	Impacted flower beds
SedgeHammer™	As needed	Shrubbery areas
Surflan* AS Herbicide	Once a year (as needed)	Lawn areas with low foot traffic

Appendix B: List of Chemicals Used Cont'd

All chemicals bought by the university must go through the EHS Manager, who **must** approve all purchases. Each chemical used on campus has its own Materials Safety Data Sheet (MSDS), which is a safely stored with the university's EHS manager

Approved Fungicide	Frequency of Application	Area of Application
Triact 70 (fUNG/PESTI)	Once a year (as needed)	Impacted areas
Companion	As needed (rarely used)	Impacted areas
Eagle 20EW	Once a year	Rose gardens

Approved Pesticide	Frequency of Application	Area of Application
Arena	Once a year (as needed)	Impacted grub control in lawns, flower beds, shrubs
Suspend	Once a year (as needed, not used preventatively)	Rose bushes, shrubbery areas
SLUGGO	2-3 times a year	Flower beds
Merit® 75 WP Insecticide	As needed	Impacted areas

Chemicals in the Process of Being Phased Out
• Hydraturf • Liquinox

Appendix C: Training Procedure

Training will be provided by the EHS Director or designee.

Frequency: Training shall be completed before the employee is allowed to handle pesticides, continually updated to cover any new pesticides that will be handled, and repeated at least annually thereafter. Certified applicators are considered trained.

Documentation: Training will be documented on a sign in sheet, including the original signature of the trainee. A signature is required, even if the employee completes an online course.

Content: Training will address the following:

1. Format and meaning of information, such as precautionary statements about human health hazards, contained in pesticide product labeling;
2. Hazards of pesticides, including acute and chronic effects, delayed effects, and sensitization, as identified in pesticide product labeling, Material Safety Data Sheets, or Pesticide Safety Information Series leaflets;
3. Routes by which pesticides can enter the body;
4. Signs and symptoms of overexposure;
5. Emergency first aid for pesticide overexposure;
6. How to obtain emergency medical care;
7. Routine and emergency decontamination procedures, including spill cleanup and the need to thoroughly shower with soap and warm water after the exposure period;
8. Need for, limitations, appropriate use, and sanitation, of, any required personal protective equipment;
9. Prevention, recognition, and first aid for heat-related illness;
10. Safety requirements and procedures for handling, transporting, storing, and disposing of pesticides;
11. Environmental concerns such as drift, runoff, and wildlife hazards;
12. Warnings about taking pesticides or pesticide containers home;
13. Requirements relating to pesticide safety, Material Safety Data Sheets, and Pesticide Safety Information Series leaflets;
14. The location of the written Pesticide Safety Information Series leaflet N-8 “Hazard Communication Information for Employees Handling Pesticides in Noncrop Settings” and Material Safety Data Sheets;
15. The employee’s rights, including the right;
    a. To personally receive information about pesticides to which he or she may be exposed;
    b. For his or her physician or employee representative to receive information about pesticides to which he or she may be exposed; and
    c. To be protected against retaliatory action due to the exercise of any of his or her rights.

Appendix D: Approaches to Reduce Pesticide Use

Besides strategically using and reducing the amount of pesticides and other chemicals on campus, Santa Clara University also aims to have alternative approaches that rely on natural processes to not only reduce the use of pesticides, but also the health and environmental impacts of chemical use

Approach	Reason
Buffer Strips, Pervious Pavement	Intercept pollutants and remove up to 50% of pesticides, trapping these chemicals to improve soil and water runoff quality
Xeriscaping (Bioswales)	Prevent chemical runoff into storm drains and requires less fertilizer and pest control measures than traditional landscapes
Stormwater Management and Infiltration Systems	Reduce pesticide loading to surface waters, especially reducing peak concentrations and cumulative mass
Native and Drought-tolerant Plants	Encourage native predators of pests for a more natural process

Glossary

Adjuvants - Emulsifiers, spreaders, and other compounds added to improve the effectiveness of a pesticide

Pesticide - A pesticide is any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest. Though often misunderstood to refer only to insecticides, the term pesticide also applies to herbicides, fungicides, and various other substances used to control pests. A pesticide is also any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant. California also regulates adjuvants as pesticides.

Exempted Pesticide Products include the following:

- Preservatives for biological specimens
- Fertilizers, nutrients, and other substances used to promote plant survival and health.
- Biological control agents, except for certain microorganisms. Biological control agents include beneficial predators such as birds or ladybugs that eat insect pests.

Pests - Any living organism that causes damage or economic loss or transmits or produces disease. Pests can be animals (like insects or mice), unwanted plants (weeds), or microorganisms (like plant diseases, bacteria and viruses).

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