



Integrated Pest Management 2024 Annual Report [draft]

County of Marin is a leader in ecologically sound Integrated Pest Management (IPM).

IPM is the system of managing pests using careful consideration and integration of all available pest control tools and techniques. Marin County's IPM Ordinance and Policy applies to 148 sites across Marin County. This includes parks and libraries, government offices, Marin County Health and Human Services sites, County Service Areas, roadsides, and traffic medians. Common IPM challenges at these locations include wasps, ants, rodents, and invasive weeds. IPM methods vary each year based on the pests, risks, and conditions in the field. The IPM program also provides outreach to the public through volunteer opportunities and education.

Key metrics for 2024:

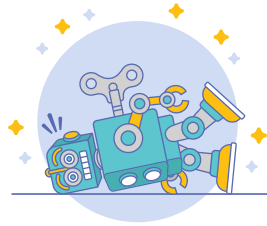
- 136 out of 148 sites managed without pesticides
- 41,606 hours dedicated to non-chemical IPM
- Volunteers contributed 8,790 hours to support non-chemical IPM
- IPM labor hours increased by 14.4% in 2024
- Efforts to protect heritage oaks in Greenbrae continued

A Commitment to Manual Methods

In 2024, labor hours for manual IPM increased by 14.4%.

County of Marin maintains a strong commitment to non-chemical, non-toxic manual methods for pest management, including:

- Mechanical and manual weed removal: mowing, flaming, weed whipping and hand-pulling
- Sheet mulching: layers of cardboard, straw, compost, and mulch to suppress weeds
- Trapping rodents
- Turf aeration and reseeding
- Adjusting irrigation as needed to support desired plants
- Pruning for plant health
- Other site modifications



Oops, something isn't right.

This visualization may have been deleted or made private.

In 2024, volunteers contributed 8,790 hours in support of non-chemical IPM, equivalent to over 4 full-time employees. Volunteers are a key component of non-chemical IPM.



Carefully Considered, Limited Pesticide Use

When pesticides are required, County of Marin prioritizes the use of organic/minimum-risk pesticides. The [Organic Materials Review Institute \(OMRI\)](#) verifies these products to meet federally regulated organic standards or qualify as [FIFRA 25B Minimum Risk](#) ("Eco-Exempt"). Marin County tracks and reports on the use of all pesticides: organic and conventional.

In 2024, conventional pesticide use decreased compared to last year, while organic pesticide stayed about the same.

CONVENTIONAL AND ORGANIC PESTICIDE USE, YEAR-OVER-YEAR
in ounces

View Chart or Table:

☒ Chart☐ Table☒ Conventional☐ Organic

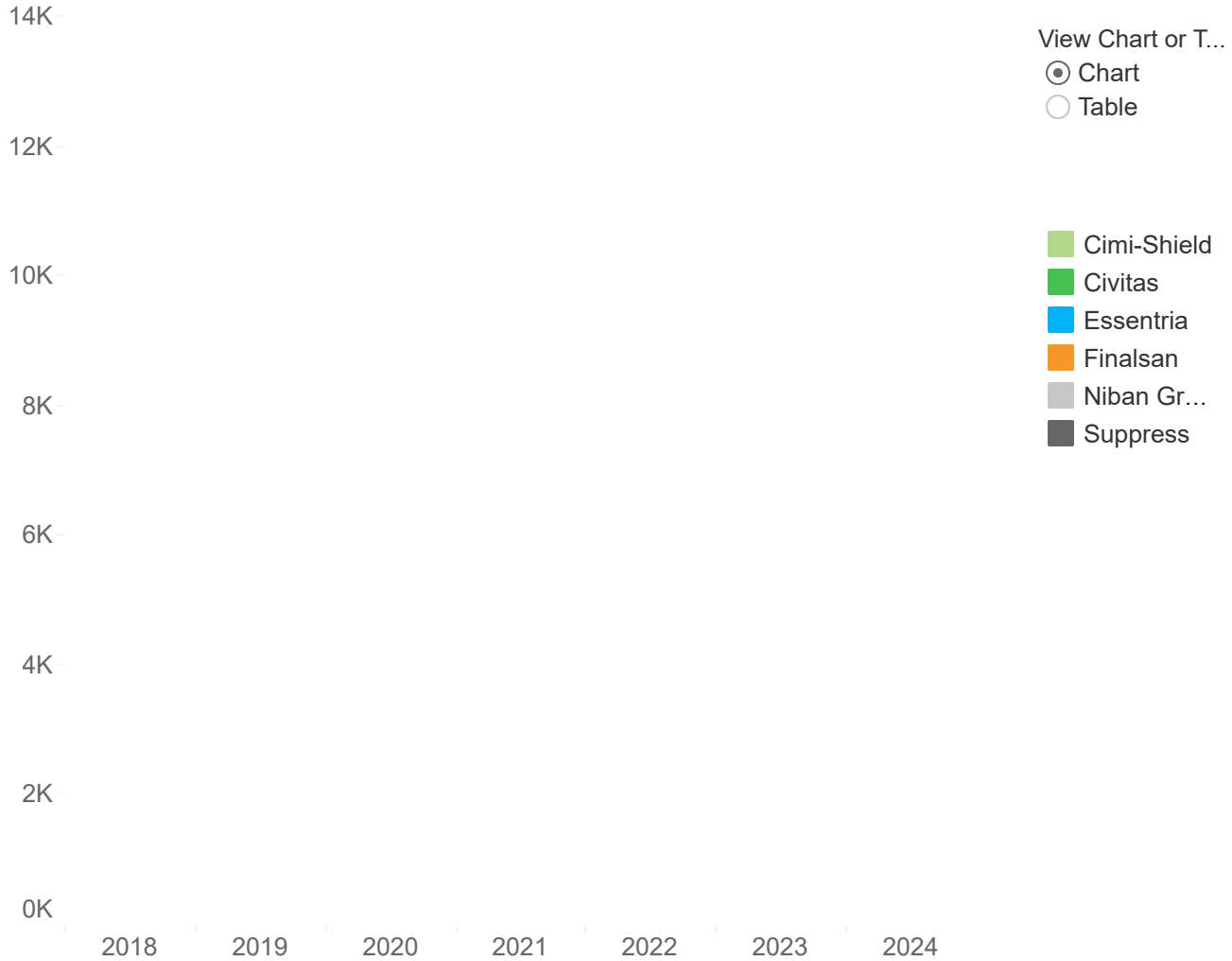
2018 2019 2020 2021 2022 2023 2024

Organic Pesticide Use 2024

The only organic pesticide used in 2024 was Essentria, which is derived from common plant oils, and is sprayed outside building perimeters of select county buildings on a quarterly basis, to act as a repellent for crawling insects such as ants, spiders, and cockroaches. Some variability year-over-year is to be expected with FIFRA 25B products that are sprayed in larger quantities, and is within the appropriate range for sites of this size.

ORGANIC PESTICIDE USE YEAR-OVER-YEAR

in ounces

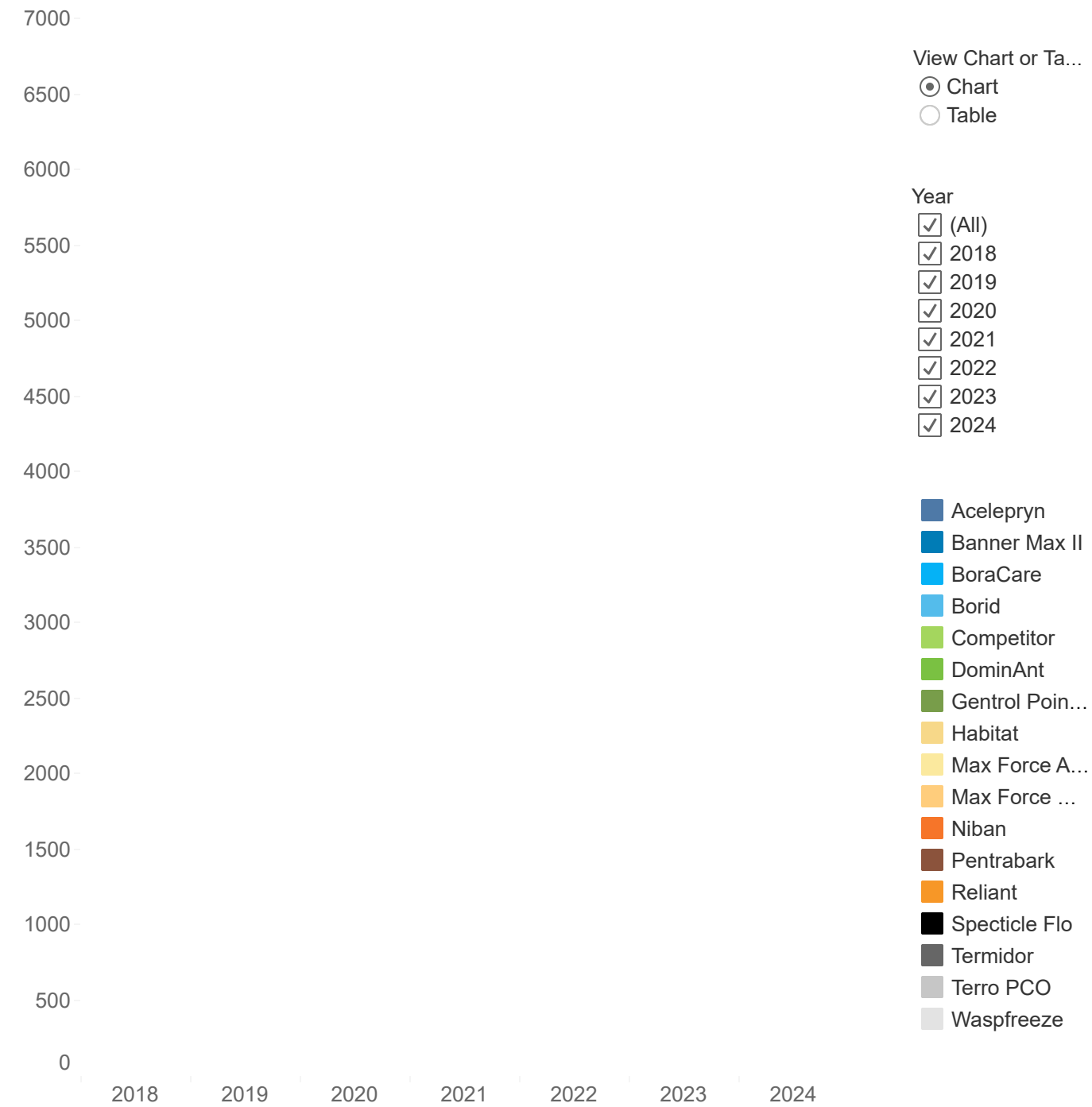


Conventional Pesticide Use 2024

Conventional pesticide use returned to about the same level as 2022 applications. We continue to use the phosphorus-based product Reliant to treat heritage oaks, prevent the progress of sudden oak death. The other most commonly used conventional pesticides on IPM sites were small ant bait stations filled with boric acid. This product is commonly available for safe use in residential homes.

CONVENTIONAL PESTICIDE USE YEAR OVER YEAR

in Ounces



Organic Pesticides Applied in 2024

Indoor Structural Pest Control

Organic and Minimum-Risk Products Used

Essentria IC 3 is an insecticide with active ingredients comprised of rosemary oil, geraniol, and peppermint oil. When applied to the perimeter of a building, this product can prevent insect pest problems from affecting structures. This product was used at GROSS Field Airport, Lucas Valley Field Office, Marin Civic Center Campus, the Marin Health and Wellness campus, Juvenile Hall, Novato Public Library, and the Marin County Social Services building.

Landscape Pest Control

Organic and Minimum-Risk Products Used

Supress is an organic herbicide that was applied to select medians in Sir Francis Drake Blvd in April of 2024. Its active ingredients are capric acid and caprylic acid.

An organic and minimum-risk product is verified by the [Organic Materials Review Institute \(OMRI\)](#) to meet federally-regulated organic standards used by certified organic food and fiber producers, or is exempt from EPA registration by qualifying for the [FIFRA 25B Minimum Risk](#) ingredients list (aka "Eco-Exempt").

Conventional Pesticides Applied in 2024

Outdoor Landscape Maintenance

Conventional Products Used

Pentrabark is a surfactant with active ingredient polyethylene glycol. It is a substance that is sprayed on tree trunks, allowing pesticide to penetrate the bark more effectively. More effective penetration allows for the same results with less pesticidal product compared to applications without Pentrabark. Increasing the amount of product that penetrates bark decreases the amount of product that runs off into the landscape. It was used to treat a limited number of heritage oak trees for Phytopthera ramorum, aka Sudden Oak Death, in Greenbrae (CSA 16).

Reliant is a product with active ingredient phosphoric acid. It was used to treat a limited number of heritage oak trees for Phytopthera ramorum, aka Sudden Oak Death, in Greenbrae (CSA 16).

Indoor Structural Maintenance

Conventional Products Used

Terro PCO also uses boric acid and was used to aid controlling ants and other crawling insects at multiple structural sites. This product uses borax as its active ingredient and was used in protected bait station.

Conventional pesticides are pest control substances or mixtures that are generally produced synthetically. If a product has not been verified by the Organic Materials Review Institute (OMRI) to meet federally-regulated organic standards, or is not on the EPA's FIFRA 25B Minimum Risk ingredient list (aka "Eco-Exempt"), the Marin County IPM program lists it as "conventional."

[View the 2024 IPM Allowed Products List on the Marin County Parks website.](#)

2024 Violations and Exemptions

EXEMPTIONS

A product that is not on the list of allowable pesticides may be approved for a specific and limited purpose by the IPM coordinator.

- On December 24, 2024, an exemption was issued for Tri-Fol, which is an organic product used as a “pH buffer,” or an acid added to water to lower the pH. This is occasionally a necessary additive when an herbicide requires low-pH water as part of the spray mix. This product is intended to be used in conjunction with Flumigard on Sir Francis Drake Blvd medians in January of 2025.
- On December 24, 2024, an exemption was issued for Flumigard, an herbicide with active ingredient flumioxazin. This product requires a low-pH water as part of the spray mix in order to be effective, and is intended to be used in conjunction with Tri-Fol on Sir Francis Drake Blvd medians in January of 2025. This product is being used to supplement manual labor, which does regularly take place in these medians, and includes mulching, weed whipping, and hand pulling weeds. Herbicide was selected as part of a suite of methods, with the goal of reducing the total hours that contractors were required to spend in busy, high-traffic medians.

VIOLATIONS

There were no violations of the Marin County IPM policy in 2024.

Proposed Changes to the Allowed Products List

Flumigard is an herbicide with active ingredient Flumioxazin, which can act as a post-emergent or pre-emergent weed suppressor. This product requires a lower pH in order to be effective, and is intended to be used in conjunction with Tri-Fol. These products will only be sprayed in very limited amounts in traffic medians, in which fast cars and heavy traffic can be a risk to contractors. They are intended to reduce the total number of hours spent manually removing weeds in Sir Francis Drake Blvd; however, contractors will still be expected to use primarily manual weed removal methods in these areas.

Tri-Fol is a pH buffer, which is occasionally necessary to add to the spray mix for products that require a lower pH in order to be effective. This product is intended to be used in conjunction with Flumigard.

Companion Maxx WP is a plant growth promoting rhizobacterium that quickly establishes beneficial colonies on the plant’s roots and leaves. This product, with active ingredient *Bacillus amyloliquefaciens* strain ENV503, acts as a fungicide by bolstering plant health and outcompeting harmful fungi. This product is intended to be used in 2025 in conjunction with Reliant and Pentrabark to suppress Sudden Oak Death in select heritage trees



Guidance and Governance

[The Integrated Pest Management Commission](#) oversees the implementation of the Marin County Integrated Pest Management ordinance and policy. The nine-member Commission also advises and makes recommendations to Marin County's IPM Coordinator and the County Board of Supervisors as needed. Commission meetings are held quarterly and are open to the public, who are encouraged to participate via public comment and direct communication with program staff.

IPM work is governed by County of Marin Ordinance No. 3521 and the [County of Marin Integrated Pest Management Policy](#). This annual report is a requirement of the County of Marin Ordinance No. 3521 and the County of Marin Integrated Pest Management Policy.

The IPM Commission also administers the annual IPM Achievement Award, which recognizes individuals and community organizations that further the goal of reducing the use of pesticides in Marin. This year's award winner is the Marin Monarch Working Group (MMWG), a collaboration established in 2019 to address the existential crisis facing the western monarch, one of California's most iconic creatures. MMWG includes educators and advocates, county and state officials, biologists and botanists, agricultural advisors, gardeners, and monarch lovers. In addition to supporting urban gardens, community science, and habitat restoration, they teach about the impacts of certain pesticides on monarch populations, and encourage non-chemical alternatives. Marin County is proud to have the opportunity to thank them for their work, and award their achievements in IPM.



Integrated Pest Management Team

Jim Chayka, Parks and Open Space Superintendent

Jim serves a key role overseeing vegetation management initiatives in collaboration with Marin CSAs and other community organizations. He is on the Executive Committee of FireSafe Marin. Jim served as Director of Natural Resources at Conservation Corps North Bay and has been working in the field of natural resources and watershed management for 17 years. He started his career in environmental stewardship as an AmeriCorps member at the CivicCorps (formerly the East Bay Conservation Corps), and subsequently managed education and restoration programs with Student Conservation Association, Watershed Sciences, Urban Creeks Council, and Sonoma Ecology Center. Jim holds an MS degree in Applied Geosciences from San Francisco State University.

Katherine Knecht, Integrated Pest Management Specialist and Senior Program Coordinator

Katherine joined the IPM team in February 2021, bringing experience with education programming, habitat restoration planning, and volunteer coordination. After growing up in Novato, she obtained a B.S. in Environmental Studies with an emphasis on ecological systems and habitat restoration from UC Santa Barbara.

Kirk Schroeder, Volunteer Program Coordinator

Kirk Schroeder has worked at Marin County Parks for over 20 years, and has over a decade of experience organizing volunteers. In his current role he coordinates volunteers to support non-chemical IPM in County parks, multiuse pathways, and other landscape service areas. He began his career as a seasonal extra-hire and moved up to Park Ranger and Supervising Ranger positions. Kirk graduated from University of California, Santa Cruz with a bachelor's degree in Fine Art, and is a certified professional lifeguard.

Glossary

Active Ingredient

An active ingredient is the part of a substance or compound that produces its chemical or biological effect. In Integrated Pest Management, it is the ingredient that prevents, destroys, repels, or mitigates a pest, or is a plant regulator, defoliant, desiccant, or nitrogen stabilizer.

Biological Control

A method of controlling pests using natural enemies such as predators, parasites, pathogens, and competitors. An example of biological control is releasing green lacewings to control aphids.

Conventional Pesticide

Pest control substances or mixtures of substances that are generally produced synthetically. Synthetic products are made by a synthetic or chemical process by human origin as opposed to occurring naturally. To avoid confusion with organic standards, the Marin County IPM program lists all non-OMRI verified pesticides as “conventional” even if the active ingredient is naturally occurring.

Cultural Control

A method of controlling pests by changing work practices to reduce pest establishment, reproduction, dispersal, and survival. Changing irrigation practices to reduce the amount of root diseases and weeds is an example of cultural control.

Fungicide

A substance or preparation used to kill fungi, including blights, mildews, molds, and rusts.

Herbicide

A substance or preparation used to kill weeds and other plants that grow where they are not wanted.

Insecticide

A substance or preparation used to kill insects and other arthropods.

Integrated Pest Management (IPM)

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.

Mechanical Control

The management and control of pests using physical means such as weeding, mowing, fences, or barriers.

“Minimum Risk” aka Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Section 25(b)

The EPA has exempted certain products from federal registration. This designation is sometimes referred to as “minimum risk.” However, these products are subject to registration by individual states. Products that are on this list must meet a series of requirements, which limit the ingredients that can be allowed. It is required that these products list all active and inert ingredients on the product label.

Organic Materials Review Institute (OMRI)

A 501(c)(3) nonprofit organization providing organic certifiers, growers, manufacturers, and suppliers an independent review of products intended for use in certified organic production, handling, and processing.

Organic Pesticide

Pest control substances or mixtures of substances that are compliant with USDA National Organic Program standards. In the United States, the term “organic” is federally regulated and governed by standards in the Code of Federal Regulations when used on

Pest

Pests are organisms that damage or interfere with desirable plants in 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.

Pesticide

A pesticide is any substance or mixture of substances intended for: preventing, destroying, repelling or mitigating any pest; use as a plant regulator, defoliant, or desiccant; or use as a nitrogen stabilizer. Fungicides, herbicides, insecticides, and rodenticides are all types of pesticides.

Pesticide Precautionary Statements

Written, printed, or graphic matter which provide the pesticide user with information regarding the toxicity, irritation and sensitization on hazards associated with the use of a pesticide as well as treatment instructions and information to reduce exposure potential.

Pesticide Product Label

The written, printed, or graphic matter on, or attached to, the pesticide or device or any of its containers or wrappers. It provides critical information about how to safely and legally handle and use pesticide product. Unlike most other types of product labels, pesticide labels are legally enforceable, and all of them carry the statement: “It is a violation of Federal law to use this product in a manner inconsistent with its labeling.”

Pesticide Toxicity Category

The EPA established four Toxicity Categories for acute hazards of pesticide products, with

food or fiber products. When the Marin County IPM program uses the term “organic,” it refers to pesticides verified by OMRI to meet federally-regulated organic standards used by certified organic food and fiber producers.

“Category I” being the highest toxicity category. Acute toxicity studies examine a product’s toxicity as it relates to six different types of exposures (acute oral, acute dermal, acute inhalation, primary eye irritation, primary skin irritation, and dermal sensitization). The product is assigned a toxicity category (I–IV) for each type of exposure based on the results of five of the six studies.

For more information about Marin County Parks, visit parks.marincounty.gov

