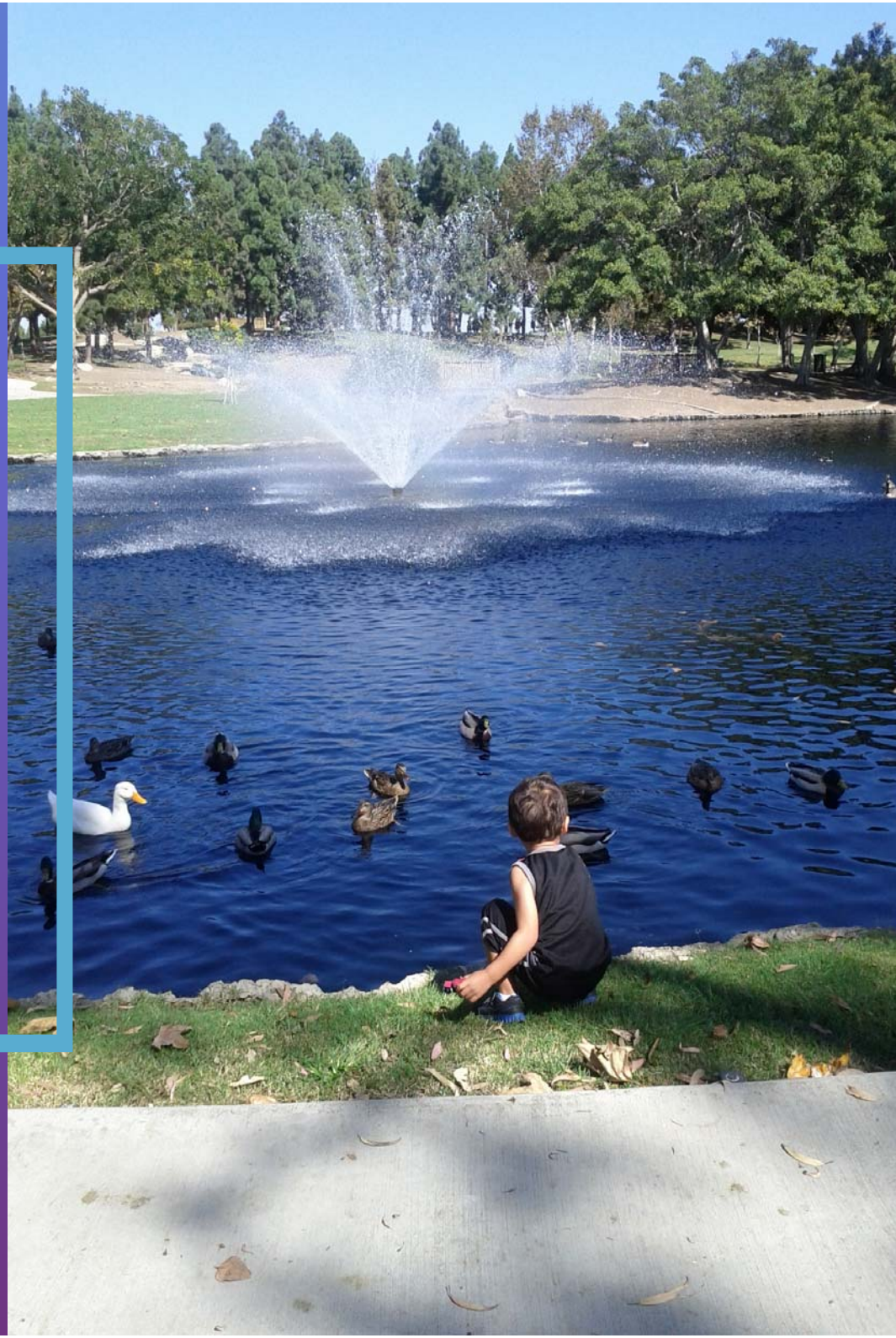
City's Integrated Pest Management (IPM) Plan & Practices

City Council Study Session

March 13, 2018



Introduction

- The purpose of this report is to present the City's pest management practices and obtain feedback from the City Council.
- The report provides an overview of how the City's practices have evolved into an Integrated Pest Management (IPM) plan
- The IPM Plan guides the City's use of least harmful pest and weed management control strategies.

Maintenance Responsibilities

- Over 181 acres of Passive Parks
- 37 acres of Sports Fields
- Over 450 linear miles of sidewalks curbs and gutters
- Over 800,000 square feet of landscaped medians and parkways
- 12 City facilities

Citywide Pest Management Guiding Principles

- Emphasis on the use of Organic materials
- Limit exposure where children and the public congregate
- Increased focus on cultural practices
- Overall reduction of the use of pesticides
- Continued evaluation of the program as new technologies in methodology and organic materials evolve

Integrated Pest Management (IPM)

- The IPM plan was developed with an ecosystem-based strategy that focuses on long term prevention of pests
- The IPM plan establishes clear criteria for acceptable circumstances in which using an organic or low-level pesticide is prioritized.
- The IPM plan presents a balanced approach between proper cultural practices, preventative practices, and the use of pesticides.
- The IPM plan exceeds standards and regulations set forth by federal, State and County agencies.

IPM Plan Comparison

- **City of Huntington Beach**
  - The City is In the process of completing a trial with the use of organic materials in one park site.
- **City of Irvine**
  - Prioritizes the use of organic pesticides and manual or mechanical weeding in all City properties.
    - Impacts of New Program:
      - Approximately $1.19 million increase to annual landscape maintenance budget
      - Landscape maintenance contractor now provides up to 29 additional employees for manual weed removal.

IPM Plan Comparison

- **City of San Juan Capistrano**
  - Treats weeds in parks with organic pesticides only. Chemical herbicides are still used in parkways and medians
    - Impacts of New Program:
      - Approximately $129,600 increase to annual landscape maintenance budget
- **City of Fountain Valley**
  - Similar to City of Costa Mesa's plan and approach

IPM Plan Comparison

- **City of San Clemente**
  - Completed a twenty-one (21) day study on the use of glyphosate versus organic pesticide.

Figure 1. Day 0 kikuyugrass plots

Figure 4. Day 21 kikuyugrass plot

Alternatives Considered & Fiscal Impact

- Eliminate the use of pesticides citywide and use only organic materials and manual or mechanical weeding.
  - This would **increase** the City's landscape maintenance contract and budget by approximately $360,000 annually and may not meet the community's or user groups' current expectations with regards to aesthetics and playability.
- Eliminate the use of pesticides in passive parks only.
  - This would **increase** the City's landscape maintenance contract and budget by approximately $230,000 annually and may not meet the community's current expectations with regards to aesthetics.

Conclusion

- The Public Services Department formalized its current maintenance practices into an IPM Plan.
- The Plan prioritizes the incorporation of organic materials and best cultural practices.
- The Plan is flexible to allow for the continued incorporation of new materials and evolving technology.
- In comparison to practices and plans in other agencies, the City's Plan attempts to achieve an ***effective balanced approach with minimal fiscal impact.***

CITY'S INTEGRATED PEST MANAGEMENT (IPM) PLAN & PRACTICES

CITY COUNCIL STUDY SESSION

MARCH 13, 2018

University of California
Orange County

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Cheryl Wilen

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Statewide IPM Program

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Education

January, 1989 to March, 1994

Ph.D. in Botany at the University of California - Riverside with emphasis on weed physiology and ecology. Dissertation title: Ecophysiological Mechanisms of *Pennisetum clandestinum* Invasions in California.

June, 1985 to June, 1988

Attended St. Louis Community College at Meremac to improve skills in data processing and computer programming.

January, 1981 to May, 1983

Master of Science in Horticulture at the University of Arizona with emphasis on vegetable production and plant protection. Thesis title: Differential Sensitivities of Transplanted Tomato Cultivars to 2,6-Dinitroaniline Herbicides.

August, 1977 to December, 1980

Bachelor of Science in Horticulture at the University of Maryland with emphasis on fruit and vegetable production.

Employment History

July, 2015 to October, 2015

Interim Director of University of California Statewide Integrated Pest Management Program. Provide administrative oversight and leadership to UC IPM Program until new Director in place. Manage staff of 17 including business manager, associate directors, writers, editors, and programmers. Responsible for travel and personnel approvals. Represent UC IPM at statewide and national level. Provide administrative and programmatic information to UC ANR upper administration. Davis, California.

April, 2014-September, 2014

Acting Director of University of California Statewide Integrated Pest Management Program. Provide administrative oversight to UC IPM Program while Director was on study leave. Manage staff of 17 including business manager, associate directors, writers, editors, and programmers. Responsible for travel and personnel approvals. Davis, California.

September, 1995 to present

Area Integrated Pest Management Advisor for Orange, Los Angeles, and San Diego Counties. Conduct applied research with growers and pest control advisors in the turf, ornamental, and nursery industries to help develop successful IPM programs. Extend information through seminars, meetings and publications. Current projects include development and implementation of IPM educational programs for non-commercial pesticide users, development of snail control monitoring programs, and vertebrate pest and weed management in nurseries and landscapes. Statewide IPM Program, University of California Cooperative Extension.

February, 1994 to September, 1995

Post-doctoral Research Fellow in the Department of Botany and Plant Sciences. Conduct studies on yellow nutsedge (*Cyperus esculentus*) in the field, greenhouse, and laboratory to establish temperature thresholds for emergence and growth. Develop and test degree-day models to predict emergence and plant development. University of California, Riverside, California.

January, 1989 to February, 1994

Graduate Research Assistant in the Department of Botany and Plant Sciences. Conducted and assisted in experiments relating to weed ecology and physiology. Projects included studies on competitive interactions between plants, measurements of growth rates and rates of photosynthesis as an indicator of potential spread of weeds, and electrophoretic examination of plant proteins. University of California, Riverside, California.

July, 1983 to December, 1988

Research Biologist heading the secondary level of screening experimental chemicals as preemergent herbicides and herbicide safeners. Evaluated chemicals' activities on whole plants and directing synthesis of compounds as indicated by trend analysis studies. Duties included supervision and coordination of technicians and conducting and interpreting quantitative structure activity studies. Maintained database of compounds' biological activities. Other duties included the interpretation of data for patent attorneys and acting as a liaison between software support personnel and researchers. Monsanto Agricultural Company, St. Louis, Missouri.

Additional information

Licenses: Pest Control Adviser (PCA) in 3 categories and Pesticide Applicator (QAL) in 2 categories

Professional Membership: Weed Science Society of America, Western Society of Weed Science, California Weed Science Society, Entomological Association of Southern California

Awards: Orange County Chapter of California Association of Nurseries and Garden Centers 2002 Research Award. California Weed Science Society 2007 Award of Excellence, 2007 IPM Innovators Award from California Dept. of Pesticide Regulation, Pacific Branch Entomological Society of America 2010 IPM Team Award

Selected Recent Publications

Refereed Publications

Wilen, C.A., V.F. Lazaneo, and S. Parker. 2011. Does the general public relate to the term "Integrated Pest Management"? J. Extension. 49:1, 1RIB3. Online http://www.joe.org/joe/2011february/rb3.php

Flint, M.L. and C.A. Wilen. 2009. Pest Notes: Snails and Slugs. UC ANR Publication number 7427.

Newman, J., K. Robb, C. Wilen. 2009. Chapter 5: Using Integrated Pest Management (IPM) to prevent pesticide runoff. Pp. 55- 72 *In*: Greenhouse and Nursery Management Practices to Protect Water Quality. *Ed.* J. Newman. UC ANR Publication number 3508.

Stapleton, J. J., C. A. Wilen, and R. H. Molinar. 2008. Pest Notes: Soil Solarization for Gardens and Landscapes. UC ANR Publication number 74145.

Varela, L.G., M.W. Johnson, L. Strand, C.A. Wilen, and C. Pickel. 2008. Light brown apple moth's arrival in California worries commodity groups. California Agriculture April–June. Pp. 57-61.

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Bell, C. E., J. M. DiTomaso, and C. A. Wilen. 2007. Pest Notes: Invasive Plants. UC ANR Publication 74139. 7pp. http://ipm.ucdavis.edu/PDF/PESTNOTES/pninvasiveplants.pdf

Wilen, C.A. and C. L. Elmore. 2007 (revised). Pest Notes: Weed Management in Landscapes. UC ANR Publication 7441.

Varela, L. G. , J. M. Hashim-Buckey, C. A. Wilen, and P. A. Phillips. 2007 (revised). Pest Notes: Glassy-winged Sharpshooter. UC ANR Publication 7492.

Wilen, C.A. 2006. Chickweeds. Pest Notes, DANR Publication number 74129.

Wilen, C.A. 2006. Common groundsel. Pest Notes, DANR Publication number 74130.

Wilen, C.A. 2006. Mallows. Pest Notes, DANR Publication number 74127.

Wilen, C.A. 2006. Puncturevine. Pest Notes, DANR Publication number 74128.

Wilen, C., D. L. Haver, M. L. Flint, P. M. Geisel, and C. L. Unruh. 2006. Hiring a pest control company UC ANR Publication number 74125.

Wilen, C., D. L. Haver, M. L. Flint, P. M. Geisel, and C. L. Unruh. 2006. Pest Notes, Pesticides: Safe and effective use in the home and landscape. UC ANR Publication 74126.

Wilen, C. A., C. E. Bell, J. I. Grieshop, and K. L. Robb. 2006. Survey of University of California Academics' Attitudes Regarding the Impact of Escaped Horticultural Introductions on Wildlands. J. Extension 44 (1) Article Number 1RIB http://www.joe.org/joe/2006february/rb1.shtml

Selected Non-Refereed Publications

Wilen, C.A. 2009. Snails and Slugs in Ornamental Production; Research Priority Setting. Report to Western IPM Center. Available at http://www.wrpmc.ucdavis.edu/CenterProjects/Wilen_Workgroup_2009_Final.pdf.

Wilen, C. 2007. Choosing herbicides responsibly. Southwest Trees and Turf 14(2):1, 14.

Wilen, C.A. 2007. Plastic mulches - it's not just black or white. Proc. 55th Calif. Weed Sci. Soc. In press.

Newman, J., K. Robb, and C. Wilen. 2007. Using Integrated Pest Management (IPM) to prevent pesticide runoff. Pp. 90-112 in: Management Practices to Protect Water Quality: A Manual for Greenhouses and Nurseries. *Ed.* J. Newman and K. Gilbert. UCCE Ventura County Publication. 188 Pp

Wilen, C., T. Salmon. T. Ellis. 2006. Cottontail Rabbit Control. Final report to California Dept. Food and Agric. 103Pp.

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Salmon, T. P., R.T. Ellis, C. A. Wilen. 2006. Ground squirrel underground baiting. Final report to California Dept. Food and Agric. 25 Pg.

Ellis, T., T. Salmon, C. Wilen . 2006. Initial evaluation of sprinkler boxes as underground bait stations for California ground squirrels. Abst. 22nd Vertebrate Pest Conf. Berkeley, CA. P. 9.

Ellis, T., C. Wilen, T. Salmon. 2006. Characterizing and averting cottontail rabbit damage in a southern California nursery. Abst. 22nd Vertebrate Pest Conf. Berkeley, CA. P. 9.

Education

Ph.D. Botany, UC Riverside. 1994
M.S. Horticulture, University of Arizona. 1983

B.S. Horticulture, University of Maryland. 1980

Specialty

Integrated Pest Management (IPM) for ornamental plant production and maintenance including nurseries, greenhouses, field production, floriculture, turf and landscape, pesticide reduction and alternatives. Research specialty in weed management, snails & slugs.

Areas of Expertise (click to see all ANR academics with this expertise)

- Subtropical Fruits
- Ornamental Crops, Landscape and Turf
- Ornamentals / Landscape / Turf - Other
- Ornamentals / Landscape / Turf - General
- Arboreta and Botanical Gardens
- Bedding / Garden Plants
- Bulbs, Corms, Rhizomes and Tubers
- Cut Flowers, Foliage and Greens
- Ground Covers
- Landscape - General
- Trees - Ornamental / Landscape / Shade
- Turf / Sod
- Woody Shrubs and Ornamental Vines
- Parks and Urban Green Space
- Horticulture
- Plants and Their Systems
- Plant Product Quality and Utility (Preharvest)
- Plant Management Systems
- Plant Protection
- Weeds Affecting Plants
- Vertebrates, Mollusks, and Other (Non Arthropod, Pathogen, Nematode, Weed) Pests
- Integrated Pest Management Systems
- Communication, Education, and Information Delivery
- Natural Resources and Environment
- Watershed Protection and Management
- Pollution Prevention and Mitigation
- Urban Agriculture/Local and Regional Food Systems
- Agriculture
- Commercial
- Organic
- Small Farms
- Pest Management/Diseases
- Ipm
- Endemic Species
- Invasives
- Weeds
- Sustainable Natural Ecosystems
- Endemic and Invasive Pests and Diseases
- Water Quality, Quantity, and Security
- Safe and Secure Food Supplies

- Sustainable Food Systems

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My role:

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California Agriculture Article Contributions

- MAINTAINING LONG-TERM MANAGEMENT: Over 35 years, integrated pest management has reduced pest risks and pesticide use
- Light brown apple moth's arrival in California worries commodity groups

ANR Workgroup Associations

- Ecological Restoration - Member
- Entomology - Member
- Floriculture and Nursery - Member
- Landscape and Urban Horticulture - Member
- Pest Management in ANR - Member
- Pesticide Use Report - Member
- Plant Pathology - Member
- Small Farm - Member
- Turfgrass - Member
- Urban Horticulture - Member
- Water Quality - Member
- Weed - Member
- Wildlife - Member

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Guiding Principles for Pesticide Use in the City of Costa Mesa

A. Landscape Maintenance IPM Guidelines
   1. Parks, Facilities and Other Public Areas
      a. All pesticides used are reviewed by a licensed Pest Control Advisor and a Written Recommendation is provided prior to the use of any conventional or organic pesticide.
      b. Use of Organic Pesticides in all City properties, when pesticides are needed.
      c. Limit exposure to any pesticides where children and the general public congregate.
      d. Use EPA Level pesticides in a targeted manner, and only if deemed necessary to protect public health and economic loss by a licensed pest control advisor and City staff, when pests cannot be managed by other methods.

- Organic Pesticides are the first option for control measures.
- Pesticides with a Caution Label shall be the first option for control measures when organic materials are not sufficient.
- All pesticides are approved by the Landscape Maintenance Supervisor prior to use. A written recommendation of the proposed pesticide, including the commercial name, concentrations, use rates, usage and re-entry time is prepared by a Pest Control Advisor licensed by the State of California and provided to the City along with copies of the label and Material Safety Data Sheet of Safety Data Sheet.
- Chemicals are applied by or under the direct supervision of those persons possessing a valid Qualified Applicators License or Certificate.
- Records of all pesticides used by the Contractor on City property shall be submitted to the Agricultural Commissioner's Office and retained by the Contractor in accordance with the Department of Pesticide Regulation requirements.

Public Works Department
Maintenance Operations
Policies and Procedures

INTEGRATED PEST MANAGEMENT PROGRAM

PURPOSE: To establish criteria for an Integrated Pest Management (IPM) Program.

POLICY: The City of Cost Mesa will focus on long-term prevention or suppression of pest problems with minimum impact on human health, the environment, and nontarget organisms with the limited use of pesticides in accordance with direction provided by the City Council for Parks, Fields and Playgrounds; City-wide Pest Management Guiding Principles, and an annual update:

Parks, Fields and Playgrounds

When pesticides are needed, use the following prioritized approach: (1) organic pesticides; (2) Water Quality Act Allowed Pesticides; and (3) EPA Level III "caution" labeled pesticides only when deemed necessary to protect public health and economic impact by a licensed pest control adviser.

Landscape Maintenance IPM Guidelines

a. All pesticides used are reviewed by a licensed Pest Control Advisor and a written recommendation is provided prior to the use of any conventional or organic pesticide.
b. Use of organic pesticides in all City properties, when pesticides are needed.
c. Limit exposure to any pesticides where children and the general public congregate.
d. Incorporate additional guidance on use of pesticides for city rights of way, facilities, and other properties as reflected in the staff report.
e. Use EPA Level pesticides in a targeted manner, and only if deemed necessary to protect public health and economic loss by a licensed pest control advisor and City staff, when pests cannot be managed by other methods that we would have.

Annual Update

Staff will return to the City Council annually with an update.

PROCEDURES:

Prevention

1. Public Works Staff shall review all new development and rehabilitation projects plans to verify compatibility with the site's environment.

Monitoring

1. The Maintenance Divisions shall hire a consultant or contractor to provide regular monitoring services for all of the City's properties.
2. The consultant or contractor shall determine if pest populations are increasing, decreasing, or staying the same and to determine when to use a control tactic.
3. The consultant or contractor shall provide monthly monitoring records which include information such as date of examination, pests found, size and extent of the infestation, location of the infestation, control options utilized, effectiveness of the control options, labor and material costs.

Non Chemical Control Measures

1. The Landscape Division shall utilize cultural controls which are modifications of normal plant care activities that reduce or prevent pests. In addition to those methods used in the pest preventions, other cultural control methods include adjusting the frequency and amount of irrigation, fertilization, and mowing height.
2. The Maintenance Divisions shall utilize mechanical control tactics involve the use of manual labor and machinery to reduce or eliminate pest problems using methods such as handpicking, physical barriers, or machinery to reduce pest abundance indirectly.
3. The Maintenance Divisions shall utilize the use of environmental manipulations that indirectly control or prevent pests by altering temperature, light, and humidity can be effective in controlling pests. Although in outdoor situations these tactics are difficult to use for most

pests, they can be effective in controlling birds and mammals if their habitat can be modified such that they do not choose to live or roost in the area.

4. The Maintenance Divisions shall utilize a biological control practice which uses living organisms to reduce pest populations. These organisms are often also referred to as beneficials, natural enemies or biocontrols. They act to keep pest populations low enough to prevent significant economic damage. Biocontrols include pathogens, parasites, predators, competitive species, and antagonistic organisms. Beneficial organisms can occur naturally or can be purchased and released. The most common organisms used for biological control in landscapes are predators, parasites, pathogens and herbivores.

Pesticide Controls

Pesticides are to be utilized in a prioritized approach on City properties as follows:

Parks, Fields and Playgrounds

When pesticides are needed, use the following prioritized approach: (1) organic pesticides; (2) Water Quality Act Allowed Pesticides; and (3) EPA Level III "caution" labeled pesticides only when deemed necessary to protect public health and economic impact by a licensed pest control adviser.

Rights of Way (Street medians/parkways) – Prioritized Use of Pesticides:

a. Use organic pesticides first, when pesticides are needed.
b. Use Clean Water Act allowed pesticides.
c. EPA Level III "caution" label pesticide only if deemed necessary to protect public health and economic impact by a licensed pest control advisor and City staff.
d. EPA Level II "warning" label pesticides, only if deemed necessary to protect public health and economic loss by a licensed pest control advisor and City staff, when other methods do not adequately control the pest.
e. EPA Level I "danger" label pesticides, only if deemed necessary to protect public health and economic loss by a licensed pest control advisor and City staff, when other methods do not adequately control the pest.

Facilities/Buildings – Prioritized Use of Pesticides:

a. Use organic pesticides first, when pesticides are needed.
b. Use Clean Water Act allowed pesticides.
c. Bait formulations of insecticides will be used where appropriate.
d. EPA Level III "caution" label pesticide only if deemed necessary to protect public health and economic impact by a licensed pest control advisor and City staff.
e. EPA Level II "warning" label pesticides, only if deemed necessary to protect public health and economic loss by a licensed pest control advisor and City staff, when other methods do not adequately control the pest.
f. EPA Level I "danger" label pesticides, only if deemed necessary to protect public health and economic loss by a licensed pest control advisor and City staff, when other methods do not adequately control the pest.

Other City Properties – Prioritized Use of Pesticides:

a. Use organic pesticides first, when pesticides are needed.
b. Use Clean Water Act allowed pesticides
c. EPA Level III "caution" label pesticide only if deemed necessary to protect public health and economic impact by a licensed pest control advisor and City staff.
d. EPA Level II "warning" label pesticides, only if deemed necessary to protect public health and economic loss by a licensed pest control advisor and City staff, when other methods do not adequately control the pest.
e. EPA Level I "danger" label pesticides, only if deemed necessary to protect public health and economic loss by a licensed pest control advisor and City staff, when other methods do not adequately control the pest Pesticides should only be used when other methods fail to provide adequate control of pests and just before pest populations cause an unacceptable damage, since the overuse of pesticides can cause beneficial organisms to be killed and pest resistance to develop.

Approvals and Application of Chemical Pesticides

1. Pesticides shall be approved by the Maintenance Division Superintendents for their area of oversight prior to use. A written recommendation of proposed pesticide, including commercial name,

concentrations, allocation rates, usage and reentry time shall be prepared by a licensed California Pest Control Advisor and site specific schedule submitted for approval. No work shall begin until written approval of use is obtained and a notice of intent has been filed with the County Agricultural Commissioner's office, as required. Copies of Safety Data Sheets and specimen labels shall be given to the City prior to pesticide use on City property.

2. Chemicals shall only be applied by those persons possessing a valid California Qualified Applicator license/certificate. Application shall be in strict accordance with all governing regulations. Records of all operations shall be kept per California Department of Pesticide Regulations.

3. Pesticides shall be applied in a manner to avoid contamination of non-target areas. Precautionary measures shall be employed to keep the public from entering the spray zone until it is safe.

4. Posting of signs shall be required at all park facilities when any application of pesticides is performed.

   Specific requirements for posting are as follows:

   - Post signs at all park entrances at least 48 hours prior to spraying applications. The vendor's contact information, chemical name and application date must be listed.
   - Place spray notices inside plastic page protectors. Attach them to a four-foot (4') high wooden stake. Signs must be readable 25' away from posted area.
   - Leave the same signs up for 72 hours after the spraying applications are completed, then remove promptly.
   - A temporary mesh fence such as orange plastic construction fencing can be erected on the perimeter of any area that is to be treated with a broadcast type application with the intent to keep people and pets off the treated area for a period of 24 hours.

Records and Reporting

Records of all pesticides used by the Contractor on City property shall be retained in accordance with Department of Pesticide Regulations. Maintenance Superintendents will keep records of all pesticide usage and provide an annual report to the Director of Public Works reflecting the pesticide usage each year. The Public Works Department will provide an annual report to the City Council.

CITY MANAGER'S OFFICE
CITY OF COSTA MESA
INTEROFFICE MEMORANDUM

TO: City Council

FROM: Thomas R. Hatch, City Manager

DATE: March 13, 2018

SUBJECT: **CA/ORANGE COUNTY CANCER DATA**

Council Member Foley requested information related to cancer cases in California. Staff obtained data for California as well as Orange County cases. The data was not immediately available by individual cities.

Attached includes information regarding the California Cancer Registry and Invasive Cancer Incidence Rates Statewide in California and Orange County. These statistics are recorded by the California Department of Public Health.

CALIFORNIA CANCER REGISTRY
CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

About Us

California Cancer Registry (CCR) is a program of the California Department of Public Health's Chronic Disease Surveillance and Research Branch (CDSRB), and works in collaboration with the Institute of Population Health Improvement, UC Davis Health Systems, regional cancer registries, health care providers, cancer registrars, and cancer researchers throughout California and the nation. CDSRB collects, analyzes, and disseminates information on cancer incidence and mortality.

Overview:

WHAT DOES THE CALIFORNIA CANCER REGISTRY DO?

The mission of the California Cancer Registry (CCR) is to serve the public by collecting statewide data, conducting surveillance and research into the causes, controls, and cures of cancer and communicating results to the public. The CCR monitors the occurrence of cancer among Californians, both incidence (new diagnoses) and mortality (deaths). The CCR, which is operated by the California Department of Public Health and ten regional cancer registries, is an essential tool for the prevention and control of cancer in California. By law (Health and Safety Code, Section 103885), all new cancer cases diagnosed in California residents since January of 1988 have been reported to the CCR, with strict guidelines to maintain patient confidentiality.

WHAT INFORMATION DOES THE CALIFORNIA CANCER REGISTRY COLLECT?

All data collected by the California Cancer Registry (CCR) are obtained directly from cancer patients' medical records. The CCR does not interview patients.

The CCR collects demographic, diagnostic, and treatment information on individual cancer cases.

- Demographic data include: patient's name, address at time of diagnosis, sex, race, and age at diagnosis.
- Diagnostic data include: type of cancer (such as breast cancer) and stage of disease at time of diagnosis.
- Treatment data include: whether the patient had surgery, radiation, or chemotherapy as the first course of treatment.

WHAT ARE THE DATA USED FOR?

California Cancer Registry (CCR) data are used to:

- Monitor the number of new cancer cases and cancer deaths over time;
- Examine disparities in cancer risk, treatment and survival;
- Examine treatment choices and other predictors of survival;
- Measure the success of cancer screening programs;

- Respond to public concerns and questions about cancer; and
- Conduct research to find the causes and cures of cancer.

Researchers have used CCR data to:

- Analyze geographic, racial/ethnic, and occupational differences in cancer risk;
- Evaluate the quality of medical care received by cancer patients; and
- Examine patient survival with respect to cancer type, extent of the disease, demographic characteristics, and other important factors.

WHAT HAS THE CALIFORNIA CANCER REGISTRY ACCOMPLISHED?

The California Cancer Registry (CCR):

- Is internationally recognized for its high quality data;
- Receives major grants to investigate the causes, prevention and the cures of cancer;
- Brings millions of research dollars to California;
- Provides information on cancer rates among the state's diverse race/ethnicity groups;
- Publishes special reports on many cancer types; and
- Provides the public access to state, regional, and county level cancer incidence and mortality rates plus interactive maps via the internet at www.ccrcal.org.

CANCER REPORTING IN CALIFORNIA – TIMELINE

- **1947** California Tumor Registry established in selected large hospitals
- **1960** Alameda County Cancer Registry established as the first population-based cancer registry in California
- **1969** San Francisco Bay Area Registry included in National Cancer Institute's (NCI) Third National Cancer Survey
- **1972** Cancer Surveillance Program (CSP) of Los Angeles County established
- **1973** San Francisco Bay Area Registry included in NCI's Surveillance, Epidemiology, and End Results (SEER) Program
- **1983** Cancer Surveillance Program of Orange County established
- **1985** California Cancer Reporting Law signed into effect (CCR established)
- **1988** Population-based cancer reporting initiated statewide
- **1992** CSP of Los Angeles County included in SEER Program
- **1997** 50 years of cancer reporting in California
- **2000** Published ten years of complete statewide cancer reporting
- **2001** Greater California Registry (all regions in California except for San Francisco and Los Angeles) included in SEER Program
- **2007** 20 years of statewide population-based cancer reporting
- **2009** Published 20 years of complete statewide cancer reporting

HOW DOES THE CALIFORNIA CANCER REGISTRY SAFEGUARD PRIVACY AND ENSURE DATA SECURITY?

The California Cancer Registry (CCR) was established in 1985 to serve as a key resource in the state for research into the causes and cures of cancer. It has a productive record of using CCR data for research and program evaluation to improve the spectrum of cancer control in California, including prevention, diagnosis, treatment and quality of life. CCR has very stringent policies and procedures to ensure that cancer data reported are maintained with the highest degree of confidentiality and privacy.

Cancer researchers must go through a rigorous process to access any CCR data. The CCR will only release patient contact information to qualified researchers under tightly controlled circumstances where the research has first been approved by the California State Committee for the Protection of Human Subjects (CPHS) Institutional Review Board. Research proposals are evaluated by CPHS to ensure patients' rights are protected and the research justified. Additionally, a federally approved Institutional Review Board (IRB) at the researcher's institution must also approve the research proposal. This IRB will also ensure that patient rights are monitored and protected.

Request Information

If you would like any additional information regarding the California Cancer Registry please contact the Webmaster at webmaster@ccr.ca.gov

Statewide

Invasive Cancer Incidence Rates in California

All Sites, 2010 - 2014

Rates by Year, All Sites | Age-Specific Rates, All Sites | Trend Graph, All Sites | 5 Year Profile, All Sites

Export as .csv

Year		2010	2011	2012	2013	2014	2010-2014
Population at Risk		37336011	37701901	38062780	38431393	38802500	190334585
Total Cases		158622	158900	158900	159690	160925	797037
Crude Rate		424.85	421.46	417.47	415.52	414.73	418.76
Age-Adjusted Rate		429.47	419.17	408.87	399.49	391.94	409.17
95% Confidence Interval	Lower	427.33	417.08	406.83	397.50	389.99	408.26
	Upper	431.62	421.27	410.92	401.49	393.89	410.08

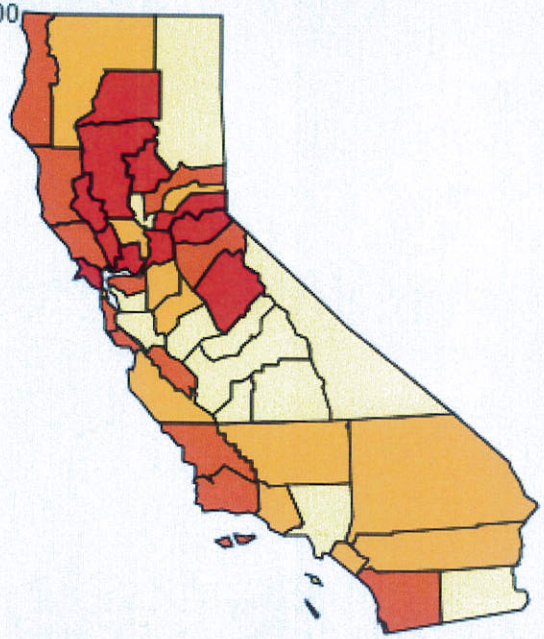
Note: All rates are per 100,000. Rates are age-adjusted to the 2000 U.S. Standard Population
Data accessed March 13, 2018. Based on Oct 2016 Extract.

California Cancer Registry

All Sites, 2010 - 2014
By County
Age-Adjusted to the 2000 U.S. Standard Population

California Rate: 409.17 / per 100,000

- 371.13 - 398.75
- 400.31 - 419.41
- 419.95 - 439.69
- 441.14 - 484.27



Data Source Invasive Cancer Incidence

Geography County

Cancer Site All Sites

Year Start 2010 | Year End 2014

Sex All | Race/Ethnicity All

Standard 2000 U.S. Standard Population

Redraw

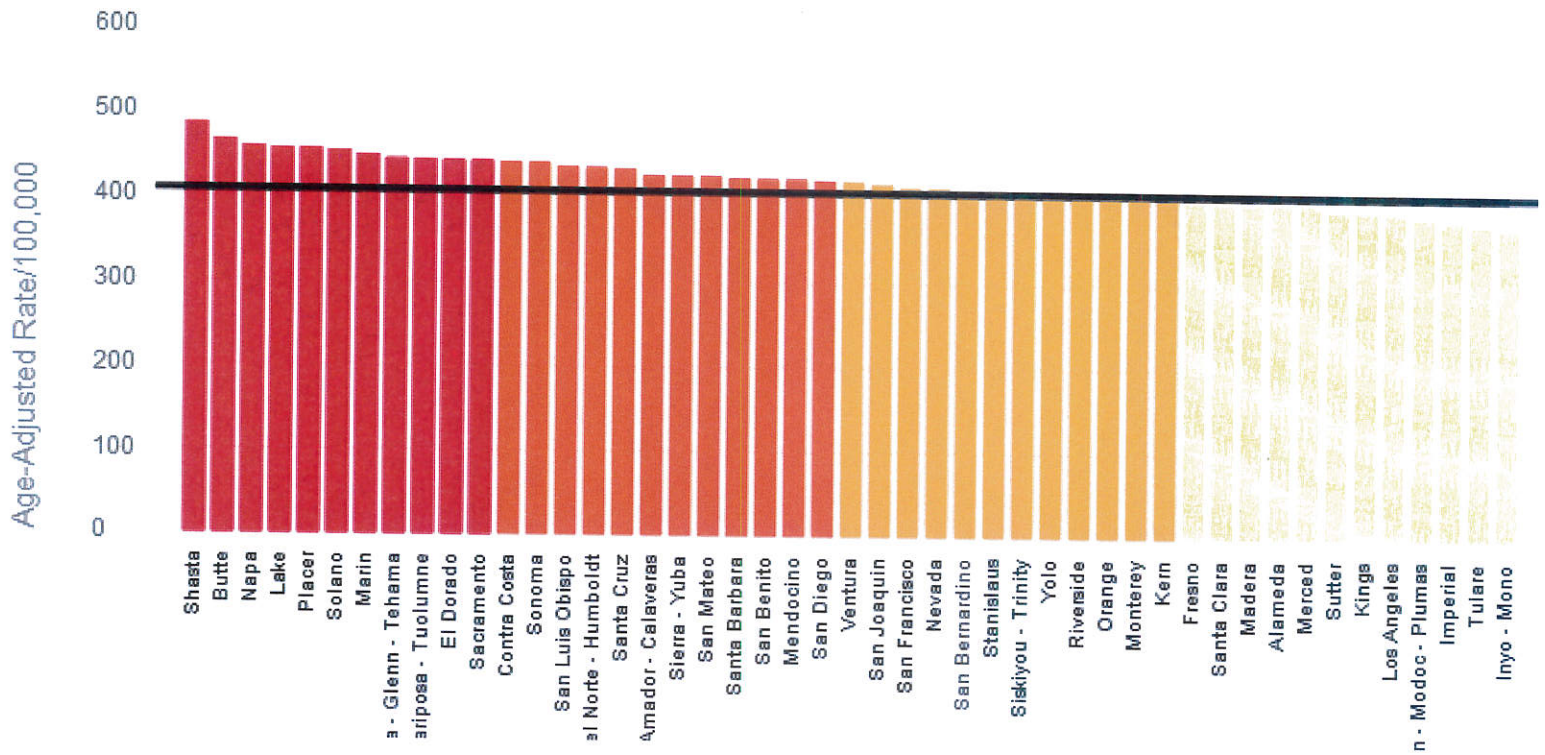
All rates per 100,000. Based on Oct 2016 Extract. Last accessed Mar 13, 2018.

Age-Adjusted Invasive Cancer Incidence Rates in California

All Sites, 2010 - 2014

Download this graph

Statewide Rate (409.17)



Orange County

Invasive Cancer Incidence Rates in California

All Sites, 2010 - 2014

Rates by Year, All Sites | Trend Graph, All Sites | 5 Year Profile, All Sites

Export as .csv

Year		2010	2011	2012	2013	2014	2010-2014
Population at Risk		3018080	3056311	3089893	3121854	3145515	15431653
Total Cases		12831	12923	12945	12922	13388	65009
Crude Rate		425.14	422.83	418.95	413.92	425.62	421.27
Age-Adjusted Rate		423.94	415.42	403.23	391.59	393.57	404.95
95% Confidence Interval	Lower	416.54	408.19	396.22	384.78	386.83	401.81
	Upper	431.43	422.74	410.34	398.50	400.39	408.12
Statewide Age-Adjusted Rate		429.47	419.17	408.87	399.49	391.94	409.17
Statewide 95% Confidence Interval	Lower	427.33	417.08	406.83	397.50	389.99	408.26
	Upper	431.62	421.27	410.92	401.49	393.89	410.08

Note: All rates are per 100,000. Rates are age-adjusted to the 2000 U.S. Standard Population
Data accessed March 13, 2018. Based on Oct 2016 Extract.

Export Citation

Copy and paste any of the formatted citations below or use the links at the bottom to export to a supported reference management software.

MLA

Age-Adjusted Invasive Cancer Incidence Rates by County in California, 2010 - 2014. Based on Oct 2016 Extract. Cancer-Rates.info. Accessed on Mar 13, 2018. California Cancer Registry. <http://cancer-rates.info/ca/>

APA

Age-Adjusted Invasive Cancer Incidence Rates by County in California, 2010 - 2014. Based on Oct 2016 Extract. California Cancer Registry. Cancer-Rates.info. Retrieved Mar 13, 2018, from http://cancer-rates.info/ca/

Chicago

Age-Adjusted Invasive Cancer Incidence Rates by County in California, 2010 - 2014. Based on Oct 2016 Extract. California Cancer Registry. Cancer-Rates.info. (accessed Mar 13, 2018).

Export to EndNote Export to BibTeX

TRAYLOR, MARIAN

Subject: FW: Response To City Staff Report Re: Pesticides in Costa Mesa
Attachments: NTCM staff report comments.pdf; iusd_ppm_program_091117_2.pdf; Marin County IPM Policy.pdf; Marin County 2017 IPM Report.pdf

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From: Vanessa Handy [vanessa.handy@sbcglobal.net]
Sent: Tuesday, March 13, 2018 11:55 AM
To: Katrina Foley; MANSOOR, ALLAN; RIGHEIMER, JIM; STEPHENS, JOHN; GENIS, SANDRA; SETHURAMAN, RAJA; LINDEMANN, BRUCE; RYAN, ROBERT S.
Cc: Christy Logue; Luka Barba; Melissa Servin
Subject: Response To City Staff Report Re: Pesticides in Costa Mesa

Dear Costa Mesa City Council and Staff,

We look forward to our discussion about the use of pesticides on city maintained property at the study session tonight. We have reviewed the staff report and supporting documents at length. Attached is our response to the staff report for your review before the meeting. We have also attached a copy of Irvine Unified School District and Marin County's IPM policies, as well as Marin County's 2017 IPM Report, as these are referenced in the response. It is our hope this will open the discussion further about our concern with the city's current use of pesticides. Please feel to reach out if you have any further questions.

Best,
Vanessa Armstrong
Melissa Servin
Christy Logue
Luka Barba

Non Toxic
Costa Mesa

Non Toxic
Costa Mesa

The purpose of this report is to comment on Costa Mesa's staff report, dated March 5, 2018, and for the study session dated March 13, 2018. We are grateful that the City of Costa Mesa is taking an interest in this subject and applaud the efforts of moving away from the use of conventional pesticides. However, based on the many examples of other municipalities having success with the use of ONLY organic methods, we feel that Costa Mesa could do better and follow the lead of successful organic land management programs.

Costa Mesa staff report content is represented in quotations with the comments from Non Toxic Costa Mesa following in green.

"IPM practices and strategies are a topic of discussion following recent determinations on the use of glyphosate, one of the most common weed control herbicides and the active ingredient in RoundUp, for treatment of weeds. In 2015, the World Health Organization's International Agency for Research on Cancer (IARC) determined glyphosate is a probable carcinogen to humans. When classifying herbicides such as glyphosate, the IARC only considers substances' carcinogenic potential and not their real-word situational exposure. However, effective July 2017, the California Office of Environmental Health and Hazard Assessment (OEHHA) mandated that products containing glyphosate be labeled as carcinogenic. In contrast, the Environmental Protection Agency (EPA) concluded that glyphosate was not likely to be carcinogenic to humans."

Glyphosate is listed as a Proposition 65 chemical that is "known to the State of California to cause cancer or reproductive toxicity." While the EPA concludes the opposite, more and more information is coming forward about the cover up from glyphosate manufacturers that they had evidence that glyphosate is in fact, a carcinogen and the EPA had knowledge of this. ***From July 2017-January 2018, 1566 ounces of Roundup have been applied on Costa Mesa maintained property.***

The City of Costa Mesa's contracted landscape management companies apply many other pesticides besides glyphosate. Because of this, the conversation here should be about ALL conventional pesticides.

It is important to understand the climate of how pesticides come to the United States market and how the pesticide manufacturers control the registration process. This should raise doubt to validity of pesticide safety.

According to the EPA, the active ingredient in a pesticide formulation is, "Any substance that will prevent, destroy, repel or mitigate any pest, or that functions as a plant

regulator, desiccant, or defoliant." In other words, the active ingredient in a pesticide product is the specific chemical that performs one of the above functions.

In addition, the EPA definition, inert ingredients are "any substance, other than an active ingredient, which is intentionally included in a pesticide product." Manufacturers of pesticides are not required to label the inert ingredients. Inert ingredients may be biologically or chemically active and are labeled inert due to their function of that specific product. For example, it will not kill a weed on its own.

Required toxicity tests are performed for the active ingredient alone in order to register a pesticide with the EPA. The active ingredient in said tests are typically less than 50% of the total pesticide formulation. The accepted regulation from the United States Department of Agriculture (USDA), Food and Drug Administration (FDA) and EPA for granting registration of a pesticide only requires a 90-day scientific study from the manufacturer of the single active ingredient, not independent scientists. In a letter from Don M. Huber, Emeritus Professor of Plant Pathology, Purdue University, "The EPA and FDA both have stated that they do no independent testing of the safety of pesticides and rely ***solely on the statements of the manufacturers that the products are safe****."*

What is not required by the EPA for pesticide registration of a pesticide product is testing of the active ingredients and inert ingredients combined. Numerous studies indicate that inert ingredients may enhance the toxicity of pesticide formulations to the nervous system, the cardiovascular system, mitochondria, genetic material, and hormone systems. Scientific studies have also suggested that not only are classified inert ingredients toxic, the combination of active ingredients and inactive ingredients increases the toxicity level. In a study from Biomedical Research International, the toxicity of Roundup (both active and inert ingredients) was found to be 125 times higher than glyphosate alone.

The US regulation process requires an unreasonable amount of scientific proof that these products are harmful before they are REMOVED from the market shelves, as opposed to scientific proof that these products are safe BEFORE going to market. Other countries in the world use the precautionary principle and require proof that these products are SAFE BEFORE they are released into the market. We have become so familiar with the use of pesticides that we accept it as normal…and it's not. In the 1950s, scientist Rachel Carson warned us about the harmful effects of pesticides, even in small doses, which led to the formation of the EPA and the ban of DDT. Yet we continue to make the same mistakes. Do you remember Big Tobacco? Industry lied to us for years. Who is to say they aren't lying to us again?

"In 2014, the City began a pilot program to evaluate the effectiveness of organic materials for weed control and reviewed its and other local agencies' cultural maintenance practices, including mowing heights and plant and shrub trimming standards, to ensure current practices were appropriate to maintain plant health and decrease the need for synthetic pesticides. Since that time and following the success of the program, the application of SpeedZone (2,4-D) in passive parks and sports fields with mixed turf was eliminated."

The Costa Mesa's Pesticide Use Reports offers a contradiction to this statement. Speedzone Southern (2,4-D) was applied in 2016 and 2017, 3,874 and 320 ounces respectively.

Speedzone Southern is a derivative of Agent Orange. The active ingredient is 2,4-Dichlorophenoxyaceticacid(2,4-D)(10.49%), one of the active ingredients in Agent Orange. It is classified by the Environmental Protection Agency (EPA) as a hazardous air pollutant and by the State of California as a toxic air contaminant. 2,4-D disrupts gut bacteria, causing an antibiotic resistance epidemic. It is linked to non-Hodgkin's lymphoma, endocrine system disruption, birth defects, myocardial infarction and type-2 diabetes, neurotoxicity, and developmental and reproductive toxicity. The toxic 2,4-D can be tracked from turf into homes and school classrooms, leaving residues of the herbicide in carpets. Due to the indisputable health concerns Ontario and Quebec, Canada have banned the use of 2,4-D on lawns and schools. The EPA's Material Safety Data Sheet and the Speedzone Southern label declares it as a "respiratory irritant that can cause irritation to skin and mucous membranes, chest burning, coughing, nausea and vomiting." 2,4-D is a "California Restricted Material" meaning it can only be applied by a certified chemical applicator and is not sold to the public (exemptions do exist).

"Additionally, the use of glyphosate citywide has decreased by approximately 85 percent, which is substantiated in the City's National Pollution Discharge Elimination Systems (NPDES) annual reporting from FY 2013-14 to FY 2016-17 (Attachment 2). The City has replaced the use of glyphosate with organic materials, including products such as Avenger and Fiesta."

The NPDES only considers two pesticides, Roundup and Speedzone, and ignores the many other non-organic pesticides used on city property. Finale, Liberate, Sureguard, Reward, Revolver, Dimension, and Specticle Flo are other pesticides used from August 2017-January 2018. Prior to August 2017, many other non-organic pesticides have been used throughout the years and have also not been considered in the NPDES.

The only organic pesticide used has been Avenger. From July 2017-January 2018, ***3,791 ounces of non-organic pesticides have been used. 1,566 ounces of the non-organic is Roundup alone. This is compared to the 3,364 ounces of an organic pesticide that has been applied****.*

Glyphosate is a known carcinogen and should not be applied in public spaces where children and pets come into contact. There are other solutions that work just as good and are cost comparable. Non Toxic Irvine has been using only organic products for two years and is the perfect resource to find the alternatives. In their 2017 IPM report, Marin County proudly announced that their glyphosate use has declined to ZERO.

Newport-Mesa Unified School District is another example. For two years, only organic pesticides have been applied. All glyphosate products have been eliminated from the list of approved products list. N-MUSD covers 58.83 square miles and serves about 22,138 students, living in the cities of Costa Mesa and Newport Beach, CA. The district is responsible for about 390 acres of non-structural land and about 2,100,000 square feet of structure. If NMUSD can do it, so can the City of Costa Mesa.

Peer review science has linked glyphosate to non-Hodgkin lymphoma, neurotoxicity and male reproductive disruption. It induces human breast cancer cell growth, is toxic to human cells, and inhibits the shikimate pathway, a key component to a healthy gut bacteria and the immune system. Glyphosate has been shown to be toxic to the liver and kidneys. Glyphosate could be an endocrine disrupter. Malfunctions and disruptions of endocrine system can lead to breast/prostate cancer, endometriosis, infertility, diabetes/metabolic syndrome, early puberty, obesity, autoimmune disease, asthma, heart disease/hypertension, stroke, Alzheimer's disease, Parkinson's disease, cancer, birth defects, erectile dysfunction, sexual development problems, neurological disorders such as: learning disabilities, attention deficit disorder, autism, dementia, Alzheimer's, and schizophrenia.

Glyphosate products should be eliminated completely.

"*Turf Areas"*

"The turf located within the City's passive parks, which includes parks without sports fields, does not receive pesticide applications. Mowing heights are maintained at appropriate levels to encourage proper turf growth and minimize weeds. These turf areas are fertilized twice annually. The fertilization consists of the application of a conventional granular fertilizer."

It is impossible to verify if pesticides are no longer applied on passive parks as the monthly Pesticide Use Reports do not state where the pesticide application has occurred. The "commodity or site treated" section on the 2017/2018 PURs simply state "park". However, there have been witness accounts of pesticide applications in Tewinkle and Fairview Park.

Conventional synthetic fertilizer does not solve the problem of healthy grass long-term. To eliminate weeds in turf, the soil must be healthy to create a strong root system. Synthetic fertilizers are a short-term solution by supplying the plant with N-P-K nutrients, yet has zero positive benefits for healthy soil. To promote healthy soil, a biological world must be created with living organic material, which provides an environment for the plants to find its own food. "Give (synthetic) a man a fish, you feed him for a day; teach (organic) a man to fish and you feed him for a lifetime." Synthetic fertilizers disturb the soil ecosystem, upset organic balance, has high salt content, leaches and creates runoff.

The solution is Organic Turf Management, which is the opposite of a product approach and the understanding of the system to make it work for us. It is a systems approach that involves understanding the basics of soil biology and solving the problem with the exclusive use of natural organic materials and revised cultural practices. The objective is to CREATE HEALTHY SOIL.

"Planters"

"Granular pre-emergent herbicide, which creates a barrier beneath the top of the soil and prevents the weeds from penetrating the soil surface, is applied to planters twice annually through the City's landscape maintenance contract. Weeds that do emerge are mechanically removed unless weed species, such as nutsedge, requires specialized treatment. Mulch is added to all planters and tree wells to minimize weed populations.

Growth of desirable plant material is encouraged through proper cultural maintenance practices as well as conventional granular fertilizer applications twice annually."

Non-organic pre-emergent herbicides have the same effect on soil as synthetic fertilizers. They do not work long-term and they kill the microbial life in the soil, which is crucial to a healthy root system.

Organic pre-emergent options like Pre-emerge are available and have been proven effective by the City of Irvine's test sites. Pre-emerge allows you to top seed the same day of application, while not compromising the soil's health as Roundup does.

"Hardscape/sidewalks"

"Weeds in the hardscapes/sidewalks are mechanically removed, when appropriate, or treated with a non-glyphosate herbicide. Some passive parks include decomposed granite (DG) trails and are maintained using glyphosate to minimize weeds and maintain the width of the trails."

Goal #5 in the City's IPM "is to establish clear criteria for acceptable circumstances in which using a pesticide other than a least harmful pesticide is necessary; ***toxic pesticides shall only be used when there is a threat to public health and safety, or to prevent economic or environmental damage."*** *How do weeds on a trail threaten public health and safety or cause economic or environmental damage, enough to justify the application a known carcinogen, glyphosate, where children and pets have direct contact? From the Pesticide Use Reports, the only organic pesticide used on city property has been Avenger. Avenger is expensive and ineffective. There are many other organic products on the market that are as effective and cost comparable to glyphosate products. These products should be explored. In addition, non-glyphosate conventional pesticides can be as equally harmful as glyphosate.*

"**(2) Sports Fields with Mixed Turf"**

"Sports fields with mixed turf do not receive broadcast applications of post-emergent herbicides. However, pre-emergent herbicide is applied once per year during annual winter closures. Glyphosate is only applied to specific locations to treat smutgrass, a persistent and invasive weed. Turf mowing heights are maintained at appropriate levels and turf is dethatched and aerated annually. Fertilizer, soil penetrant, and organic root stimulants are applied monthly to encourage proper turf growth and minimize weeds."

"(3) Sports Fields with Hybrid Bermuda Grass"

"Hybrid Bermuda grass is engineered specifically for sports fields and is thereby used in two of the City's sports complexes: Jack Hammett Sports Complex and TeWinkle Athletic Complex. A one-time application of pre-emergent herbicide is applied at both sports complexes during annual summer renovation closure. Targeted applications of post emergent herbicides are applied at Jack Hammett Sports Complex during either the annual summer or winter closures to control invasive grasses, such as kikuyu grass, nutgrass, broadleaf weeds, and *poa annua.* Turf mowing heights are maintained at appropriate levels and turf is dethatched and aerated annually. Fertilizer, soil penetrant,

and organic root stimulants are applied monthly to encourage proper turf growth and minimize weeds."

Sport fields have the most traffic of children and pets and should therefore be excluded from the application of all synthetic products. Even though they are applied "once per year" these products persist in the soil for a very long time. This can be explained by the half-life of a product.

The more pesticides are applied, bioaccumulation of the toxic substance occurs and the longer it takes for the pesticide to be removed from the environment. How long a pesticide stays in the environment is described by the half-life. The definition of a half-life is the time it takes for the pesticide to decay to half its original concentration. The half-life for a pesticide is a range of time and varies depending on environmental conditions. An average of these various conditions are used to determine a pesticide's half-life. Using Roundup as an example, according to Monsanto, Roundup's manufacturer, the average half-life is 40 days. After 40 days, one-half of the pesticide is present in the environment, after another 40 days, one half of that amount is present and so on. In this example it takes a little over 200 days for Roundup to be eliminated from the environment and that is with only ONE application. Considering the science of bioaccumulation and half-lives, we can make the deduction that if pesticides are continuously applied, their persistence in soil will be permanent. Children and pets will be constantly exposed and our environment poisoned.

The solution for eliminating synthetic products on sports fields is again, Organic Turf Management-HEALTHY SOIL TO PROMOTE HEALTHY ROOT SYSTEMS. Organically managed turf is not only safer because it eliminates exposure to toxins, it provides a softer playing field due to the absorbent soil and it uses less water over time due to water retention. We have the resources and connections to experts that can assist the City of Costa Mesa. Beyond Pesticides offers grants and support to municipalities committed to moving away from conventional turf management.

The City of Irvine has a Organic Turf Management test site. (See Attachment 1)

"**(4) City Sidewalks, Curbs and Gutters"**

"Weeds in the City's sidewalks, curbs and gutters are spot treated with a combination of organic material, synthetic post emergent, and pre-emergent herbicide. Volunteer or feral palms, plants that are not purposely planted, are spot treated with a specialized conventional material. Organic materials are ineffective in treating these types of plants due to the thick, waxy leaves of the palms."

The EPA does not require scientific proof that the combination of pesticides is safe. It is reckless to combine any pesticide, pre and post emergent. This policy of pesticide application is again in contradiction of the City's IPM policy, "to establish clear criteria for acceptable circumstances in which using a pesticide other than a least harmful pesticide is necessary; ***toxic pesticides shall only be used when there is a threat to public health and safety, or to prevent economic or environmental damage."***

Over the past two years, many organic products have been readily made available. Some of these products are just as effective and cost comparable to non-organic

pesticides. Due to increased demand, these products are now available by local distributors. According to Costa Mesa Pesticide Use Reports, no other organic pesticides besides Avenger have been applied. How can city staff be certain that "organic materials are ineffective" if organic products have not been tested?

City sidewalks, curb and gutters should be exempt from pesticides, organic or not. People and pets have direct contact with sidewalks and spraying in the gutters causes these products to runoff into our ocean.

"(5) Drought Impacted Turf Medians"

"Governor Brown's Executive Order's B-26-14 and B-28-14 proclaimed a State of Emergency because of severe drought conditions and thereby implemented watering restrictions of turf medians. Consequently, the City stopped irrigating the turf medians. To prevent the reestablishment of pre-existing turf, glyphosate is applied, as needed."

The use of synthetic pesticides enhances severe drought conditions. As mentioned above, soil biology is crucial to plant health. Healthy soil allows for better water penetration and retention. The use of pesticides creates compacted soil in which the water is unable to penetrate and therefore, runs off. It would be ideal to remove turf from the medians and replace them with drought resistant plants. However, for the short-term, glyphosate should not be the solution for continually killing the turf/weeds. An organic product would work just as well until plans for a drought resistant landscape can be actualized. Conversely, if it were more cost effective to keep the turf on the medians, Organic Turf Management would solve the need for a reduction in watering.

"Throughout the City's landscaped areas, conventional fertilizers are applied to encourage proper turf and plant growth and assist in minimizing weeds. Aquatic forms of glyphosate are used around lakes, ponds, and streams within the City to control weeds as organic materials are not approved for use adjacent to water."

Conventional fertilizers are not the optimum approach for the reasons stated above, they do not promote healthy soil and inhibit long-term plant growth.

The use of glyphosate products around lakes, ponds and streams is harmful to our environment. Based on half-lives, these products persist for an extended period of time. How does the city come to the conclusion that aquatic glyphosate products are the only solution to control weeds around water? The City of Irvine does not use glyphosate products. Has City staff explored these alternatives with the City of Irvine?

“City Rodent Control Practices”

“The City relies on rodent control practices to eliminate or minimize holes in the turf, both within passive parks and sports fields, thereby limiting the potential for injuries or accidents. Additionally, without such practices, the potential for rodent populations to increase at an uncontrolled rate could contribute to erosion and destabilize slopes. The City’s rodent control contract permits the use of aluminum phosphide, which is placed in the rodent’s burrow system approximately six (6) to eight (8) inches below the ground. The material is activated by moisture and is contained underground within the burrow system. There is currently no effective organic material that assists in the control of rodents.”

*The statement of “there is currently no effective organic material that assists in the control of rodents” is **false**. The City of Irvine uses organic methods, as does many other municipalities around the country. These alternatives should be explored and implemented.*

Rodenticides are an environmental concern as they often to not kill the rodent immediately. The rodent ingests the poison and can leave its habitat before it dies. This endangers the food chain, as a natural predator will eat the infected rodent, which in turn poisons birds, their natural predators and so on through the food chain. Many agencies agree that rodenticides are not the solution. Additionally, the use of rodenticides contradicts the City’s IPM Criteria for Selecting Treatment Strategies, “Least toxic to non-target organisms other than natural controls.”

Marin County has an excellent IPM program and is rodenticide free. Their 2017 annual IPM report can be found here: https://www.marincounty.org/~/media/files/departments/pk/integrated-pest-mgmt/all-reports/fnl_web_lores_ipm-ar_2017.pdf?la=en

“ANALYSIS:”

“The City’s cultural maintenance practices embody a balanced approach to weed and pest management. To formalize the City’s maintenance practices, Public Services staff developed an IPM plan to continue to guide the use of environmentally sensitive pest management strategies and least harmful control methods to enhance the health and safety of the public and to protect the environment.”

“IPM Plan”

“The IPM plan was developed with an ecosystem-based strategy that establishes clear criteria for acceptable circumstances in which using an organic or low-level pesticide is prioritized. The plan exceeds standards and regulations set forth by federal, State and County agencies. One of the characteristics of this plan’s approach that makes it effective is that the basic decision-making process is the same for any pest problem in any location. The plan provides flexibility to adjust strategies and tactics while following the same steps to determine the best course of action. The IPM plan presents a balanced approach between proper cultural practices, preventative practices, and the use of pesticides.”

The City of Costa Mesa's IPM plan dated March 2018, does not give clear criteria for pest management. Rather it gives broad strategies that lack specific quantifiable outcomes and solutions. The IPM outlines a Response Plan, Setting Injury and Action Levels and Criteria for Selecting Treatment Strategies. Two strategies listed are "Least hazardous to human health" and "acceptable circumstances in which using an organic or low-level pesticide is prioritized." What does the plan quantify as "least hazard" and what specifically is an "acceptable circumstance," or "a low-level pesticide"? For example, the city uses glyphosate products in situations that contradict the strategy of, "establish(ing) clear criteria for acceptable circumstances in which using a pesticide other than a least harmful pesticide is necessary; toxic pesticides shall only be used when there is a threat to public health and safety, or to prevent economic or environmental damage." We would argue that weeds on a decomposed granite path do not fall under the guideline of "threat to public health and safety" or "economic or environmental damage" and therefore does not justify the use a known carcinogen, which is not "least hazardous to human health."

Because of the lack specific directive in the current IPM plan, it is crucial that City Council adopt a comprehensive plan outlining specific directive to city staff and landscape contractors.

See Irvine Unified School District's policy as an example of clear directive for city staff and contracted landscape maintenance. (Attached in email) https://iusd.org/sites/default/files/iusd_ppm_program_091117_2.pdf

Marin County is an excellent example of a true working IPM policy. (Attached in email) https://www.marincounty.org/~/media/files/departments/pk/integrated-pest-mgmt/61813-bos-approved-ipm-policy.pdf?la=en

"(2) City of Irvine"

"The City of Irvine initiated a new IPM program in February 2016. The City's program prioritizes the use of organic pesticides and manual or mechanical weeding in all City properties. The City of Irvine found that the new IPM program required the use of more labor, more product, and increased frequency of applications to provide a similar result as compared to past pesticide practices per its IPM Program 2016 Annual Report (Attachment 3). As stated in the report, the fiscal impact of the new program is an anticipated increase of approximately $1.19 million to the Public Works $21.2 million annual landscape maintenance budget. The City's landscape maintenance contractors also provide up to twenty-nine (29) full-time equivalent employees to manually remove weeds. In contrast, the City of Costa Mesa's IPM plan uses a more balanced approach that has minimal fiscal impact while still reducing the use of pesticides."

The City of Costa Mesa's IPM plan is too broad for staff to indicate that it is a "more balanced approach." The plan's broad guidelines mimic other IPM policies but it fails to include specific directive.

The 2016 $1.19 million cost increase was due to the fact that it was the first year the plan was implemented. All organic products had to be shipped from the East Coast, purchased in bulk with extremely high costs of shipping. In 2016, the city used cost prohibitive products (Avenger), which added to the increased costs. Currently, the City

of Irvine has learned from their trial and error, have identified cost comparable organic products and have secured local distributors to supply these products. More organic products are now available that are just as effective and cost comparable to non-organic products.

The increase in the City of Irvine's costs is also credited to the size of the organic program implemented. Organic Turf test sites were established as well as many other programs to only use organic methods. Additionally the 11% increase for minimum wage can be attributed for the increase cost of labor.

The City of Costa Mesa will not necessarily need to increase their costs for going strictly organic. The size of the program is under the discretion of the City Council and the City of Irvine can be used as an example for approved programs.

"(5) City of San Clemente"

"The City of San Clemente completed a twenty-one (21) day study (Attachment 4) on glyphosate versus organic pesticide. The approximately one-month study included the application of glyphosate in two plots of kikuyu grass and the application of Avenger in two adjacent plots. The study concluded that while organic materials can be effective with controlling some weeds, they are not as effective in controlling all weeds in all situations. Organic materials only eradicate the surface of the weed, not the roots. The study also concluded that it would be cumbersome and inefficient to use only organic materials and that the organic materials are approximately forty-times more expensive than conventional products."

The City of San Clemente's study compared the cost and effectiveness of the organic herbicide Avenger and the non-organic herbicide Roundup. Avenger is not the preferred organic alternative to Roundup, as it is cost prohibitive and ineffective. The study fails to include other organic products and is therefore misleading.

"ALTERNATIVES CONSIDERED:"

"One alternative for consideration is to eliminate the use of pesticides citywide. By eliminating the use of pesticides, the City would rely solely on organic materials and manual or mechanical weeding. This alternative would mirror the City of Irvine's IPM program and increase the City's landscape maintenance contract and budget by approximately $360,000 annually."

This is the only acceptable alternative that should be considered. It is not indicated where city staff has come up with an increase in cost of $360,000 but it is an assumption that this includes the cost of Avenger, which is NOT what the city should be using. There are MANY other lower cost options.

We appreciate the City's concern about the cost of relying strictly on organic methods, but the cost of continued exposure of toxic pesticides to our most vulnerable citizens, children and pets, should be considered as well. With what we know about the harmful effects of pesticides, how can it be justified to expose citizens and the environment to a poison to save money? Particularly when the pesticide is to kill a WEED. In the City's IPM plan it states, "Establish clear criteria for acceptable circumstances in which using a

pesticide other than a least harmful pesticide is necessary; ***toxic pesticides shall only be used when there is a threat to public health and safety, or to prevent economic or environmental damage."*** *The burden of proof to apply a non-organic pesticide because there is a threat to public health and safety or to prevent economic or environmental damage falls on the city. Glyphosate to control weeds on decomposed granite fails to meet this guideline, for example.*

We are exposing our children and pets over and over again to toxic pesticides, they are everywhere; food, homes, parks, city property and schools. The continued exposure is reckless, particularly since non-chemical approaches for weed abatement have proven to have advantages over chemically treated protocols. Non-chemical maintenance protocols can be less costly, better for the environment and safer for our children and pets. Two local examples are The City of Irvine and our very own school district, NMUSD. A non-local example is Marin County, as their IPM policy has evolved over the past 8 years and their annual reports are available on their website. One member of Non Toxic Costa Mesa is has professional relationship with a member of the Marin County IPM Commission and can easily utilize them as a resource.

The chemical companies have done a very good job at marketing their products as safe, and while The City of Costa Mesa is following mainstream protocol, it is time to come to the realization the emerging science indicates these products are extremely dangerous. It is our duty as parents and adults in the community to make a stand and fight for the health and safety of today's generation and those that follow.

"Another alternative for consideration would be to eliminate the use of pesticides in passive parks only. This alternative would be similar to the City of San Juan Capistrano's IPM plan and increase the City's landscape maintenance contract and budget by approximately $230,000 annually."

This option does not satisfy the urgency of stopping our citizen's exposure to harmful pesticides. Nor does it align with the City's IPM guidelines, as written.

Attachment 1

City of Irvine's Organic Turf Management Test Site

The turf at the bottom of the picture is organically managed with the systems approach of improving the soil health after one year. In contrast, the brownish turf behind the green turf is conventionally managed with synthetic fertilizers.

Irvine Unified School District

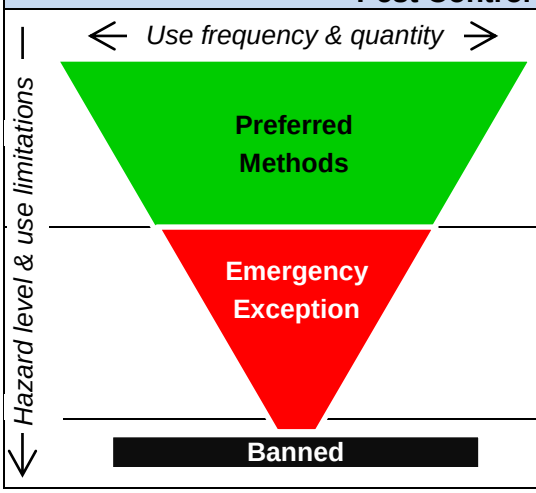
Progressive Pest Management (PPM) Program

Contents

1.0 Introduction

Consistent with federal and State of California requirements, IUSD's Maintenance & Operations Department follows a Progressive Pest Management (PPM) program for landscape and building maintenance on IUSD maintained property and campuses. The PPM program incorporates the use of prevention strategies, non-chemical controls, and chemical controls (i.e., pesticides). A pesticide is any substance, or mixture of substances, used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest that may be detrimental to vegetation, humans or animals. By definition, whether the chemical is organic or synthetic, it is still a pesticide if the intent is to treat for a pest. The guiding principles of the program and a pest control ranking overview are provided below:

Pest Control Ranking Overview



- Non-chemical practices to prevent or minimize development of conditions requiring intervention.
- Use of approved exempt very low hazard, organic products following specified procedures at discretion of trained staff.

- Use only approved, low, moderate or high hazard products when necessary to protect public health and undue economic impact.
- Use only after obtaining supervisor approval.
- Notify PMC when high hazard products used.

- Prohibited from use.

IUSD Progressive Pest Management Guiding Principles

1. Use pest prevention practices to avoid the use of pesticides or other pest control methods.
2. Use non-chemical methods as a first choice for pest control.
3. Limit the use chemical methods (i.e., pesticides) to situations where non-chemical methods fail.
4. Emphasize the use of exempt, very low hazard, organic pesticides when chemical controls are needed, and only use more hazardous pesticides as necessary to protect public health and undue economic impact.
5. Limit exposure to pesticide applicators and nearby persons (especially where children, faculty and the general public congregate) and ensure proper notification before and after use.
6. Use only pesticides that have been approved by the IUSD Pest Management Committee (PMC), which includes representation from community stakeholders.

Further elaboration and guidance regarding these principles is contained in the sections that follow.

2.0 Pest Control Protocols

IUSD prioritizes prevention and non-chemical control measures by following a systematic approach that uses extensive knowledge about pests and their hosts, such as infestation thresholds, life histories, and environmental requirements to compliment and facilitate biological and other natural control of pests. Pest control flowcharts are specifically developed for each types of pest. These flowcharts contain:

1. Appropriate prevention strategies;
2. Monitoring protocols with associated tolerance/action thresholds;
3. Tiered application of control measures moving from non-chemical methods, to low hazard pesticides and to higher hazard pesticides; and
4. Specific use requirements and restrictions for each control method and product.

3.0 Prevention Strategies (Preferred)

IUSD implements practices to prevent the development of pest conditions that may require control. Examples include selecting plants compatible with a site's environment, maintaining good housekeeping practices, sealing points of entry to buildings, using organic fertilizer, using beneficial insects, and applying landscape design adjacent to buildings that reduce pest habitat. The "California Academy of Sciences Integrated Pest Management Plan (10/7/10)" is used as a reference model for developing IUSD specific practices.

4.0 Non-Chemical Control Methods (Preferred)

IUSD implements non-chemical (and generally non-controversial) biological, cultural, and physical methods as a first choice to control pests. Examples include using deterrents, elimination of attractive sources, and physical removal of pests. The "California Academy of Sciences Integrated Pest Management Plan (10/7/10)" is used as a reference model for developing IUSD specific practices.

5.0 Chemical Control Methods (Preferred, Exception, Banned)

IUSD uses chemical controls (i.e., pesticides) only when non-chemical methods fail to provide adequate control. Pesticide selection criteria and related use restrictions are provided in Figure 1. The Pest Management Committee (PMC) reviews and approves specific pesticide products for specific uses within IUSD. Approved and banned products and related use restrictions are maintained in the IUSD Pesticide Inventory. IUSD, and its retained vendors, can only use approved pesticides from this list, which has been developed in conjunction with the PMC.

5.1 Pesticide Rankings

The IUSD Pesticides Inventory groups pesticides as follows:

- **Preferred**. Approved pesticides can be used at discretion of trained IUSD staff when non-chemical methods are not successful. These include products that are:
    1. California Healthy Schools Act Exempt (CA HSA exempt); or
    2. Both a) San Francisco Environment tier III (lowest) hazard, and b) Environmental Protection Agency (EPA) signal word category IV (very low toxicity).

- **Exception.** Approved pesticides can only be used after non-chemical and "preferred" pesticide methods are not successful, and when needed to protect risks to public health or to avoid undue economic impact. They can only be used with prior approval from an IUSD pest control supervisor, and in the case of highest hazard products, the PMC must be specifically notified upon each use. This group includes non CA HSA exempt products that are:

1. Both SF Environment tier III (lowest) hazard and EPA signal word category III (low toxicity, "caution");
2. Both SF Environment tier II (moderate) hazard and EPA signal word category II (moderate toxicity, "warning"); and
3. Both SF Environment tier I (highest) hazard and EPA signal word category I (high toxicity, "danger").

- **Banned.** Listed pesticides are prohibited from use within IUSD. Determinations are made by the Pest Management Committee.

For both "preferred" and "emergency exception" pesticides, preference is given to the selection of organic based pesticides certified by the Organic Materials Review Institute (OMRI) or an equivalent certifying body. Likewise, preference is given to products specifically listed on the current SF Environment Reduced Risk Pesticides list.

Provisions for the use the highest hazard products are necessary to prevent IUSD from being vulnerable to infestations, loss of plant materials, diminished use of facilities, and risks to public health.

Some non-chemical methods may be assigned to higher hazard ranking categories based upon the judgment of the PMC.

5.2 Ranking Resources

IUSD ranks chemical hazards primarily using the following resources:

1. California Healthy Schools Act Exempt Flowchart (9/13/16)
   a. http://apps.cdpr.ca.gov/schoolipm/hsa_flowchart.pdf
   b. Incorporates Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) section 25b minimum risk pesticides criteria.
   c. Gives preference to gel/past bait formulations self contained bait traps due to their reduced risk of exposure to people.
2. San Francisco Environment "Guide to San Francisco's Reduced Risk Pesticide List (9/1/13)"
   a. https://sfenvironment.org/sites/default/files/fliers/files/sfe_th_guide_to_reduced_risk_pesticide_listposted.pdf
   b. The SF Environment criteria incorporate Clean Water Act, California Proposition 65, and EPA signal word criteria.
   c. SF Environment also maintains a current reduced risk pesticides list, which lists products specifically identified for use by San Francisco governmental agencies.
3. EPA Office of Pesticide Programs Label Review Manual, Chapter 7 (July 2014)
   a. https://www.epa.gov/pesticide-registration/label-review-manual
   b. Defines signal word category criteria.
   c. EPA categories IV and III are both within SF Environment "lowest" hazard category for toxicity EPA categories II and I are incorporated into SF Environment "moderate" and "highest" hazard categories, respectively.
4. Pesticide Research Institute (PRI) "Pesticide Product Evaluator" Database
   a. http://www.pesticideresearch.com/site/evaluator/
   b. Evaluates products and determines those that are CA HSA Exempt.
   c. Evaluates products per the SF Environment criteria.
   d. Indicates EPA signal words categories.

County of Marin Integrated Pest Management Policy

I. PREAMBLE

An Integrated Pest Management (IPM) policy was adopted by the Marin County Department of Parks and Open Space in 1983, and an ordinance that applied to all departments was adopted in 1998. These efforts have significantly reduced pesticide use by Marin County and eliminated use of the most hazardous pesticides. Since that time, a strong interest and concern for the environment and public health resulted in the Board of Supervisors passing a resolution supporting the Precautionary Principle on October 5. 2004 (Resolution No. 2004-108). Application of IPM principles is one concrete way that Marin County staff demonstrates their commitment to follow a precautionary approach. This IPM policy supports the goals of the Precautionary Principle and achieves County of Marin Strategic Plan goals and objectives to protect public health and our environment

It is the purpose and intent of this policy to ensure effective pest management while continuing to minimize the use of chemical pest control methods with the goal of eliminating the use of pesticides.

It is also the purpose and intent of this policy to outline how county departments are to perform pest management and to ensure compliance with the county's IPM ordinance. In addressing pest management needs the county shall focus on long-term prevention or ongoing suppression of pest problems, including consideration of a "no action" approach to minimize or preclude the need to use chemical pest control methods. The county recognizes that pesticides are potentially hazardous to human health, wildlife and the environment, and shall give preference to available, safe and effective non-pesticide alternatives and cultural practices when considering options for pest management on county property.

A. County Policy

It is the policy of the County that:

1. Departments performing pest management will comply with the County of Marin's IPM ordinance and policy. This policy will apply to all property owned, leased or managed by the county, including all county departments. To the extent that Marin County service areas (CSAs) and special districts contract with the County of Marin for pest management services, the County of Marin's IPM ordinance and policy shall apply.
2. Departments will require contractors providing pest management services to comply with the county IPM ordinance and IPM policy.
3. The county's IPM program will include the following components:
   - **(a)** Education of county staff and public using county facilities about pest management and IPM.
   - **(b)** Pest identification and least toxic methods to control pests.
   - **(c)** Reducing to the maximum extent the use of pesticides.
   - **(d)** Consideration of the outcome of taking a "no-action" approach.
   - **(e)** Review and consideration of available non-chemical options before using a chemical pesticide.
   - **(f)** Identification and evaluation of conditions that encourage pest problems.
   - **(g)** Careful and efficient inspection, monitoring, and assessment of pest problems by designated personnel knowledgeable of IPM methods.
   - **(h)** Maintenance of records by county departments on IPM methods considered and used to prevent and control pests.

Adopted 6/18/13

(i) Compliance with all applicable state and federal regulations including pesticide use and reporting.
(j) Open public access to all IPM program information and records.
(k) Decision making that is based on the best available science and data.

B. IPM Goals

IPM goals regarding pesticide selection and use include:

1. Elimination of Category I and II pesticides.
2. Minimization of the use of Category III and IV pesticides.
3. Elimination of pesticides that are classified by government agencies, identified in Section VII (B, 1-6) as known, probable or possible carcinogens, reproductive toxicants, (teratogens, mutagens), endocrine disruptors, carbamates, organophosphates, or ground water contaminants.
4. The County of Marin will use pesticides only when necessary and will select a pesticide that is both effective and least toxic.
5. Turf grass areas, playgrounds, and picnic table areas on county property will be designated as pesticide free.
6. Development of site specific management plans and pest specific plans to prevent or reduce the incidence of pest problems, with careful consideration given to protect public health and safety, wildlife, and the environment.
7. Development of pest specific plans to address the common and widely spread pests, rodents, yellow jackets, and cockroaches.
8. Expansion of IPM practices and best management practices with the goal of eliminating the use of pesticides.

II. DEFINITIONS FOR USE WITH THIS POLICY

A. Definitions for use with this policy shall be as defined in Integrated Pest Management Ordinance No. 3521, adopted by the Board of Supervisors on July 21, 2009, and its successors.

III. IPM COMMISSION

A. Composition of IPM Commission

The IPM commission shall consist of nine persons and will include the following representatives approved by the Board of Supervisors:

1. A representative of the University of California experienced and educated in IPM practices.
2. A representative of the public health community with expertise and knowledge in the effects of pesticide and chemicals on human health.
3. A licensed pest control applicator or pest control advisor who is supportive of least-toxic IPM practices and who is not a county employee.
4. At least five persons, one appointed by each Marin County supervisor. Each appointment represents the community at large, or a recognized environmental, and/or health organization.
5. An at-large public member.

Commission members will serve a two-year, staggered term and are eligible for reappointment.

Any member of the public or organization, including the Health Council, may make a recommendation to the Board of Supervisors regarding open positions on the IPM commission.

B. Responsibilities of IPM Commission

The IPM Commission shall:

1. Meet quarterly. The IPM coordinator and the IPM chair shall work together to coordinate IPM meeting agendas. All meetings shall be noticed and time will be allowed for public comment. Meetings will be conducted according to the Brown Act and Robert's Rules of Order.
2. Participate in training on the Brown Act and any additional training required by the county.
3. Review and understand the County of Marin's IPM ordinance and policy.
4. Be knowledgeable concerning IPM and understand pest management.
5. Be knowledgeable concerning county pests, pest management needs and practices.
6. Work together to ensure that all decisions follow the Board of Supervisors' purposes and intents regarding the implementation of the IPM ordinance and policy.
7. Review the IPM coordinator's reports, including site specific pest management plans created during that year, and include their comments as part of the commission's annual report. During the interim, the chair may report success and known problems as they arise.
8. Create and submit to the Board of Supervisors an annual report and work plan that shall include an update on goals and key initiatives, accomplishments; goals, and key initiatives for the next fiscal year, and any other Board or County Administrator requirements.
9. Additional and on-going duties of the IPM commission are to attend their regular meetings which include a review of quarterly reports and pesticide use and any recommendations for changes to the list of allowed products.
10. Help identify effective and safe substitutes to pesticides, and identify appropriate measures that further streamline the response to emergency pest management challenges. They may explore creative, common sense approaches for achieving transitions to least-toxic pest control, including prioritizing the elimination of pesticides.
11. Advise the Board of Supervisors on IPM issues, including the IPM commission budget.
12. Review and comment on any proposed changes to the IPM ordinance or policy prior to Marin County Parks' presentation of such changes to the Board of Supervisors.
13. Make recommendations to the Board of Supervisors regarding IPM funding opportunities or needs.
14. Review and recommend any changes in bylaws to the Board of Supervisors for final approval.
15. All members of the IPM commission are subject to Marin County Board of Supervisors' Resolution No. 2006-112, and any updates thereafter.
16. IPM Commission members shall serve without reimbursement, including reimbursement for expenses incurred while serving on the commission.

IV. IPM COORDINATOR

A. Designation of IPM Coordinator

The Board of Supervisors shall designate an IPM coordinator who will operate within Marin County Parks to coordinate implementation of the IPM ordinance and policy, and to provide administrative support to the IPM commission.

B. Responsibilities of IPM Coordinator

The IPM Coordinator shall:

1. Ensure each county department IPM liaison has reviewed and understands the requirements of the county IPM ordinance and policy.
2. Organize IPM trainings for county IPM liaisons and department staff as needed.
3. Develop Best Management Practices (BMP) and site treatment history sheets for county departments and work with county departments performing pest management to maintain and update those sheets.
4. Work with county departments performing pest management to develop site specific pest management plans.
5. Work with county departments performing pest management to develop forms summarizing pesticide use, and a form for exemption requests.
6. Work in coordination with the County of Marin Health Officer to ensure that any public health issues are addressed as needed.
7. Create a standardized design for a pesticide application notification sign that includes the date of application, the name and type of product used, the signal word, the URL for the county IPM website, and a contact telephone number where the public may call for information about the proposed application.
8. Establish and maintain an accurate pesticide application recordkeeping and reporting system.
9. Review such records and reports to ensure compliance with the IPM ordinance and policy.
10. Review, determine, and track both approved and unapproved pesticide application exemption requests and report exemptions granted to the IPM commission at their next regular meeting.
11. Track use of cultural practices, non-chemical actions, and pesticides.
12. Develop and maintain a list of pesticides that may be used by the county. Present the list annually for review by the commission and then adoption by the Board of Supervisors.
13. Request information on inert ingredients from manufacturers of any pesticide used on county property and provide the information on the website when available.
14. Provide a copy of the annual report to the IPM commission in advance of its first quarterly meeting and before it is to be submitted to the Board of Supervisors.
15. Provide an annual report to the Board of Supervisors at the first available board meeting in February that includes a review of the county's pesticide use, exemptions granted, pest management projects, site specific pest management plans completed during the year, trainings offered, and any proposed modifications to the county's pesticide list or special use category designation, and progress towards any benchmark reductions.
16. Attend county IPM commission meetings and provide updates.

17. Provide administrative support to the IPM commission.
18. Provide and update an IPM website.

C. IPM Website

The IPM coordinator, through Marin County Parks, shall continue to provide and keep updated an IPM website that includes, but is not limited to:

1. List of pesticides allowed for use by the county.
2. Active ingredients for all pesticides used on county property as well as inert ingredients when disclosed by the product manufacturer.
3. Advance postings of pending pesticide applications by location and/or site in accordance with policy.
4. Amounts and locations of pesticides used by county in the last year.
5. The IPM coordinator and IPM commission's annual reports.
6. Approved exemptions.
7. A link to the IPM ordinance.
8. A link to the IPM policy.
9. The IPM Commission meeting schedule and location.
10. The IPM Commission meeting agenda and approved minutes.
11. Contact information for the IPM coordinator.
12. Useful IPM related links (e.g. UC IPM, MCSTOPPP, California Proposition 65, U.S. EPA, CA Department of Pesticide Regulation, BIRC).
13. Information concerning pesticide product half life and link(s) to relevant source material.
14. Completed BMP sheets.
15. Completed site treatment history sheets.
16. Site specific pest management plans.

V. COUNTY DEPARTMENTS

A. Responsibilities of Departments Performing Pest Control

County Departments Performing Pest Control Shall:

1. Comply with the IPM ordinance and policy.
2. Designate an IPM liaison and program manager knowledgeable and experienced in IPM practices, whose responsibilities include:
   - **(a)** Work with the IPM coordinator to review departmental pest management operations and help identify departmental IPM needs;
   - **(b)** Work with the IPM coordinator and department liaisons to prioritize and site specific pest management plans or BMP sheets within the budget process. High prioritization will be given to any sites where there is a potential need for use of a material from the special use pesticide category;
   - **(c)** Post and provide notification as required in this policy, including notification of the IPM coordinator in time to update the IPM website;
   - **(d)** Maintain pesticide application records and provide reports to IPM coordinator on a monthly basis;
   - **(e)** Collect and summarize data on non-pesticide alternatives and provide the information to the IPM coordinator on a monthly basis;
   - **(f)** Attend IPM commission meetings as needed;

(g) Work with IPM coordinator to organize staff training and encourage attendance by appropriate department staff;
(h) Disseminate pest management materials and policies at department level;
(i) Attend public meetings as needed.

3. Designation of IPM liaison
See item SectionV(B-3) below.

B. Responsibilities of Departments Not Authorized to Perform Pest Management

All County Departments not authorized to perform pest management shall:

1. Adhere to the IPM ordinance and policy.
2. Not apply or possess any pesticide on county properties.
3. Designate an IPM liaison who shall:
   (a) Act as department contact on IPM matters and pest-related issues;
   (b) Review and understand the county IPM ordinance and policy;
   (c) Review compliance with the IPM ordinance and policy;
   (d) Make completed BMP and site treatment history sheets for their department sites accessible;
   (e) Assist IPM coordinator in dissemination of IPM educational materials; and
   (f) Attend trainings that may be provided by the IPM coordinator, including training on providing public access to information regarding pest management activities in county facilities.

VI. PEST MANAGEMENT PLANNING

A. County Locations Requiring Complex and On-Going Pest Management

For county locations requiring complex and on-going pest management, the IPM coordinator, in cooperation with department staff, shall help in the development and maintenance of site specific pest management plans that provide sufficient information to facilitate IPM decision making. These site specific pest management plans should:

1. Provide education for department IPM contacts, staff performing pest control, and county employees.
2. Establish ongoing scouting or inspection procedures to monitor pest population levels. Perform thorough in-field assessments of each pest problem. Keep records of such monitoring. Monitoring should be performed by designated personnel or contractor knowledgeable in IPM methods.
3. Assess potential injury levels from the presence of the pest in four primary areas: human health, wildlife protection, environmental conditions, and economic impacts in order to establish action levels sufficient to warrant treatment.
4. Determine corrective actions when an action level is reached. Review and consider all available alternative options for acceptability and feasibility, including consideration of the outcome if no action is taken.
5. Identify and evaluate conditions that encourage pest problems. Recommend modifications to pest ecosystems to reduce access to food and living space through physical and cultural practices.

6. Evaluate landscape sites to help determine BMPs based on site needs and constraints.
7. Determine the most effective treatment time based on pest biology and other variables, such as public access, weather, seasonal changes in wildlife use, and local conditions.

8. Establish and maintain an accurate record-keeping system to catalog monitoring information and to evaluate effectiveness of IPM practices:
   (a) Use physical pest controls such as cultivation, traps, and barriers (exclusions).
   (b) Employ practices, including water management, mulching, waste management, and food storage to reduce pest populations.
   (c) Design, construct, or modify indoor and outdoor areas to reduce or eliminate pest habitats.
   (d) Use pest resistant plants and planting systems that minimize pest infestations.
   (e) Use biological pest controls whenever possible.

9. Identify the potential need for the use of any pesticide, examine alternatives to reduce the need for their use, and establish benchmarks with a goal of a ten percent (10%) per year reduction based on pesticide product, pest conditions, and funding. Progress will be re-evaluated annually by the departments, IPM coordinator, and IPM commission and reported to the Board of Supervisors as part of their annual reports.

10. Evaluate the need for pesticide-free zones and appropriate buffers.

B. County Departments and Offices Requiring Pest Control on an As-Needed Basis

County departments and offices requiring pest control on an as-needed basis are to maintain a pest specific Best Management Practices (BMP) sheet which will serve as the site plan for the facility, and a "Site Treatment History" sheet which provides a record of any treatments made at that site. BMP and site treatment history sheets shall be developed by the IPM coordinator with the assistance of county staff and IPM liaisons.

BMP sheets are to identify the department's IPM liaison, outline employee responsibilities in maintaining a pest free environment, identify pests likely to be encountered, identify who to contact when pests are found, and articulate immediate steps to mitigate the problem until pest management professionals arrive.

Site treatment history sheets shall document any pesticide treatments on the site documenting the treatment date, pest, and material applied.

BMP and site treatment history sheets are to be maintained on site and readily available to staff, the IPM Commission, and members of the public upon request. These sheets will also be available on the county's IPM website.

C. Assessment of Condition/Need

When a report of a pest problem is received, an assessment will be performed by a person knowledgeable in pest management. This assessment should confirm and identify the pest, establish what actions have already been taken, and if further action is deemed necessary that person will contact the appropriate department responsible for performing pest management functions. That department, in consultation with the IPM coordinator (as needed), will determine whether a pest complaint warrants further action. Appropriate non-chemical options such as cultural practices and additional BMPs shall be considered at this time.

If it is determined that it may be necessary to use a pesticide in the landscape, an assessment of the site and pest will be done by a licensed pest control adviser. For structural treatment, a licensed pest control operator will determine appropriate products for treatment that will include only those pesticide products allowed for use on county property and will follow the "Guidelines for Pesticide Selection" (Section VII). These recommendations for treatment shall specify the material to be used, the pest to be controlled, the rate of application, the dilution, and specify practices to address environmental or health hazards associated with that material's use.

Turf grass areas, playgrounds and picnic areas shall be designated as pesticide-free zones. No chemical controls shall be used in these areas unless required to protect public health and safety per the Limited Use Exemption Process, Section VII (E). In the event a limited use exemption is granted, special precautions will be used to reduce potential exposure. The area will be fenced off to deny access while work is in progress, the product will only be used in conjunction with a comprehensive renovation program based on best management practices and every effort will be made to reduce the need for additional treatment in the future.

Buffer zones around pesticide-free zones and adjacent to waterways and wetlands will be determined as part of the site specific pest management plan. Federal, state, and local requirements regarding buffer zone size will be adopted using the requirement that is the most restrictive and protective of the public, wildlife, and the environment.

No rodenticide baits will be applied in open areas unless under an exemption, and no such baits will be used in areas where owl boxes are present. Mechanical snap traps are to be used whenever possible and practical on county properties.
In areas where it is determined appropriate to use rodenticides, they shall only be used in association with anchored and locked bait boxes. Non-toxic tracking blocks will be used in boxes and monitored to establish vertebrate activity before placing a rodenticide in the box.

D. Guidelines for Pest Treatment

If it is determined that treatment is needed, the following criteria are to be used in determining the appropriate treatment strategy:

1. Least-disruptive of natural controls;
2. Least-hazardous to human health;
3. Least-toxic to non-target organisms;
4. Protective of wildlife and the native habitat;
5. Least-damaging to the general environment;

6. Cultural, biological, and mechanical solutions have been considered and evaluated;
7. Prior treatments used on site to control the pest and an evaluation of the success of that approach;
8. Most likely to produce a permanent reduction in the environment's ability to support target pests; and
9. Cost effectiveness in the short and long term.

VII. GUIDELINES FOR PESTICIDE SELECTION

A. Development of List of Pesticides allowed for Use on County Property

It is a goal of the county to minimize the use of Category III pesticides by giving preference to eco-exempt products and those approved by the Organic Materials Research Institute (OMRI) or by the National Organic Program for use in organic systems as available and effective.

Pursuant to the criteria listed Section VI (D), and those outlined below, and in consultation with department personnel performing pest control and IPM pest control specialists, the IPM coordinator will maintain a list of pesticides allowed for use as part of the county's IPM program. This list will include the EPA registration number, the active ingredient(s), the signal word, the product formulation, and use. This list will be developed by the IPM coordinator in cooperation with departments and will be available for review and comment by the IPM commission at their next regularly scheduled meeting, but not less than thirty (30) days after the adoption of this policy. Once adopted by the Board of Supervisors, the list will be available on the IPM website. Any pesticide use will be in accordance with state and federal laws and in accordance with this policy and the IPM ordinance, whichever is most restrictive.

Departments using pesticides are to review the pesticide list each year with the IPM coordinator. Any proposed changes are to be reviewed by the IPM commission before it is submitted to the Board of Supervisors for consideration for approval.

B. Chemical Prohibitions for the Pesticide List

Except as noted under the special use category, pesticides included in the pesticide list shall not contain ingredients identified in the following sources:

1. Products listed as Toxicity Category I or II.
2. California's Proposition 65 list (the Safe Drinking Water and Toxic Enforcement Act of 1986, materials known to the State to cause cancer or reproductive or developmental toxicity).
3. California's Department of Pesticide Regulation groundwater protection list (Food and Agricultural Code 13145(d)).
4. Organophosphates, or organochlorines, or carbamates listed by the United States Environmental Protection Agency (Office or Pesticides Programs, Document 735-F-99-14, May 1999), or California Environmental Protection Agency , Department of Pesticide Regulation Chemical Inquiries Database.
5. A known carcinogen, probable carcinogen, or possible carcinogen by the United States Environmental Protection Agency as per "List of Chemicals Evaluated for Carcinogenic Potential".

6. Any known endocrine disruptor listed by the United States Environmental Protection Agency or the European Union, Endocrine Disruptors website.

C. Special Use Pesticide Category

There may be circumstances when it is necessary to a use a pesticide that does not meet the criteria for use under Section VI (D,1-6). The pesticide list may include these special use categories of materials that are considered critical to the protection of public health, the environment, wildlife, safety, or the preservation of county property. These materials will only be used in conjunction with an IPM program where there are no feasible alternatives. These products will be identified on the pesticide list which will specify:

1. The particular criteria that is inconsistent with Section B above.
2. The specific circumstances and conditions for which the product may be used.
3. The method of application.
4. How the site is to be managed to preclude potential exposure.

D. Benchmark Pesticides

Some of these special use pesticide category products may pose a particular environmental concern or health risk. There may be circumstances when the analysis of alternatives for a particular site indicates the necessity for limited use of such products. Benchmark reductions for these products will be developed as part of the site specific pest management plans. Because these are products of particular concern, it is the goal of the county to eliminate benchmarked products. Their use will be reduced over time as effective less toxic alternatives are identified, and those alternatives are added to the pesticide list to substitute for the benchmarked pesticide. Departments having the need to use benchmarked products will annually provide an explanation of why product use was necessary, discuss potential alternatives, and outline a plan for implementation of feasible alternatives at the appropriate IPM commission meeting. Progress towards meeting the benchmarks for reduction will be reviewed at that time.

A pesticide product not listed in the special use pesticide category may still be targeted for benchmark reductions as part of a site specific pest management plan.

E. Limited Use Exemptions

County departments responsible for performing pest management shall submit a request for an exemption to the IPM coordinator to use a pesticide that is not on the pesticide list as per Sections (B) and (C) above. The IPM coordinator may approve a limited use exemption request if the material is being used in association with an active IPM program and the department, through submittal of an exemption request form, has demonstrated that:

1. A compelling need to use the pesticide, such as public health or safety, or substantial economic detriment;
2. The investigating of all available options and finding of no viable alternatives;
3. The development of a plan to preclude the need for future use; and
4. It is the department's intent to use the material for a limited period of time.

The IPM coordinator shall report any limited use exemptions to the IPM commission at their next meeting and shall include it in his quarterly communication and as part of the annual report to the Board of Supervisors.

VIII. CONTRACTS, NOTIFICATION, AND RECORDKEEPING

A. IPM Contracts

All contractors who manage pests on county owned, leased, or managed property shall be required to adhere to the guidelines established in the county's IPM ordinance and policy

1. The IPM coordinator shall assist county departments in developing contract language and in the selection of the successful contractor.
2. Contractors are required to maintain records of pest control activities, and submit a summary of activities to the department upon completion of the job. Contractors providing regular and ongoing service shall submit summaries to the department on a monthly basis. Records are to include the date, name of the pest, the site/location where the work was done, name of the technician performing the work, and corrective action(s) taken. If a pesticide was used, the product name and amount applied must also be reported.
3. Contractors are required to comply with the notification requirements as listed in this policy.

An RFP process is required for all contractors performing structural pest management on county-owned and/or managed property. The selected contractor must have comparable qualifications to those identified in the IPM STAR or Eco-Wise certification programs.

B. Notification

The county shall provide the public and its employees with notification of pesticide applications through the use of signs, voice mail, and the IPM website.

1. Signs should be posted at all regular public and employee points of entry to the treated area pursuant to state and/or federal law, Marin County IPM ordinance and policy, and according to product label instructions.
2. Signs shall be posted four days in advance of application and remain in place for four days following the application unless the manufacturer's product label specifies a longer posting period. If volatile pesticides are sprayed indoors for structural application, notification signs shall be posted seven days in advance of application and remain in place for seven days following the application.
3. Signs shall contain the name and active ingredient(s) of the pesticide product, the target pest, signal word indicating the toxicity category of the pesticide product, the re-entry interval as determined by the product label or regulation, the name and contact number for the county department responsible for the application, and the web address of the county IPM website.
4. Signs should be of a standardized design that is easily recognizable to the public and employees.

5. When using approved Category IV, Eco-exempt or OMRI approved pesticides, posting, as above, may be on the day of application and remain in place for at least four days.
6. For the Marin County Civic Center, a sign will be created that explains that an IPM program is in place at the Civic Center and that pesticides may be used in the building. Signs will be located near each of the primary entrances, will direct the readers where to obtain further information and will contain information as to current treatment status.
7. For every building and site where pesticide baits are used, signs shall be posted at a conspicuous location and include information as outlined above (# 3).
8. County departments shall not be required to post signs in right-of-way locations that the general public does not use for recreation or pedestrian purposes, such as median strips. However, notification of pesticide applications in right-of-way locations shall be available on the public access telephone number and the IPM website.
9. At least four days prior to the application of a pesticide, the department seeking to apply the pesticide shall provide the IPM coordinator with all relevant notification information and the IPM coordinator shall post that information to the county IPM website as soon as possible.
10. County departments may obtain authorization from the IPM coordinator to apply a pesticide without providing a one to four day advance notice if there is a compelling need to use the pesticide, such as a threat to public health, safety, county property, or substantial economic detriment. Signs meeting the requirements as outlined above (# 2), shall be posted as soon as possible prior to application, and remain posted four following the application.

C. Recordkeeping and Reporting

The county's IPM program is based on site specific pest management plans and BMP sheets that guide pest management practices, careful and efficient inspection and monitoring of pest problems, as well as the maintenance of records by designated personnel who are knowledgeable in IPM methods.

All records and information concerning the county IPM program will be made available to employees, the IPM commission, and the public upon request in accordance with all applicable state and Marin County laws governing public access to information.

1. County Departments

Each county department that is responsible for IPM program implementation shall maintain records of pest related treatments, including management, cultural practices, and chemical methods. These records shall be maintained per the county and state records retention policies and/or law.

Departments are to annually submit to the IPM coordinator copies of BMP sheets as well as maintain a record of all exemption requests. Departments are to report to the IPM coordinator any departmental IPM needs and maintain records of IPM or pesticide related training of staff.

Records of management and cultural activities are to be provided to the IPM coordinator on a quarterly basis and are to include:

(a) The target pest;

(b) Type of management or cultural activity used;
(c) Treatment location and date; and
(d) An estimate of time or cost.

If pesticides are used, application records are to be provided to the IPM coordinator on a monthly basis, and in addition to the information outlined in (a)–(d) above, shall include:
(e) The EPA registration number of the product used;
(f) The quantity of material applied; and
(g) The name of the applicator.

2. Contractors

Contractors shall maintain application records and treatment information as outlined in Section VIII, (C-1) and are to provide this information to the responsible department immediately upon completion of treatment so the department can fulfill reporting obligations. For structural treatments, the contractor will also update the site treatment history sheet immediately following treatment.

3. IPM Coordinator

The IPM Coordinator shall:
(a) Maintain all necessary records in order to prepare an annual report for the Board of Supervisors that includes a review and summary of the county's pesticide use, cultural practices and non-chemical pest control activities, exemptions granted, training offered, any proposed modifications to the county's pesticide list and any suggestions for amendments or resources needed for effective implementation of the IPM policy and ordinance.
(b) Maintain records of IPM liaisons, completed BMP sheets, site-specific pest management plans, and any other planning documents developed to guide departmental staff in implementing the IPM policy and ordinance.
(c) Provide a copy of annual report to the IPM Commission prior to its first quarterly meeting.
(d) Provide an annual report to the Board of Supervisors at the first available board meeting in February that includes a review and summary of the county's pesticide use, exemptions granted, pest management projects, training offered, and any proposed modifications to the county's pesticide list, or special use category designation, and progress towards any benchmark reductions.
(e) See that the IPM commission meeting agendas, minutes and other IPM documents are maintained as required by the Marin County Records Retention Schedule.

Prepared by
Marin County Parks

INTEGRATED PEST MANAGEMENT

ANNUAL REPORT 2017

Photo by Chuck Barnes courtesy One Tam

Marin County Integrated Pest Management

Integrated Pest Management (IPM) is an system of managing pests using careful consideration and integration of all available pest control tools and techniques. The target invasive species, conservation goals, and site conditions guide a systematic decision-making process on what methods to use. Mechanical and physical pest controls include weeding, mulching, weed-whipping, mowing. Cultural control means changing work practices to reduce pests, such as altering irrigation practices to reduce weeds. Biological controls use natural enemies (predators, parasites, pathogens, and competitors) to control pests. Pesticides are used only after monitoring indicates they are needed according to established guidelines. A pesticide is a natural or synthetic chemical preparation used to destroy plant, fungal, insect, or animal pests.

Marin County Parks, in collaboration with other County departments, administers IPM for the County of Marin. The program is governed by County Ordinance 3598.

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. The Commission meets quarterly and meetings are open to the public.

The County's IPM program covers 147 sites including county parks and libraries, the Marin County Jail, Marin County government offices, Marin County Health and Human Services sites, and traffic median sites throughout Marin. These locations tend to be heavily populated and used for recreation or business. Common IPM challenges in these locations include wasps, ants, roaches, rodents, and weeds that may present a public health hazard. In addition to IPM, the county IPM program provides outreach to the public through volunteer opportunities and education.

The County's IPM program cares for heavily populated locations where rodents, weeds, or diseased trees may present a public health and safety hazard.

2017 Summary

Keeping Marin County safe and healthy.

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

Marin County is a regional and national leader in non-chemical IPM alternatives. In 2017, Parks successfully managed 126 sites without pesticide, and conventional pesticide use decreased 86% over the previous year. Marin County uses zero glyphosate and zero rodenticide across all 147 sites governed by the County's IPM ordinance. To achieve this, volunteer, staff, and contracted work hours increased to over 43,000 labor hours dedicated to non-chemical IPM, and organic pesticide use also increased. Parks networks with other regional IPM agencies on shared challenges and has become a resource for other agencies across the nation.

Sound IPM employs a creative, comprehensive strategy. Not all pests are a problem. By continuously monitoring plant and animal populations, Marin County's IPM team focused on pests that affected safety or were likely to damage public recreation sites and impair county services. Each location was individually assessed. Treatment choices were based on level of risk, severity, timing, effectiveness, available resources, and cost. Multiple methods were often employed, including hand-pulling, mulching, and mowing. The IPM program also consisted of contract oversight, reporting, communication, and coordination with the County's Agricultural Commissioner and the California Department of Pesticide Regulation.

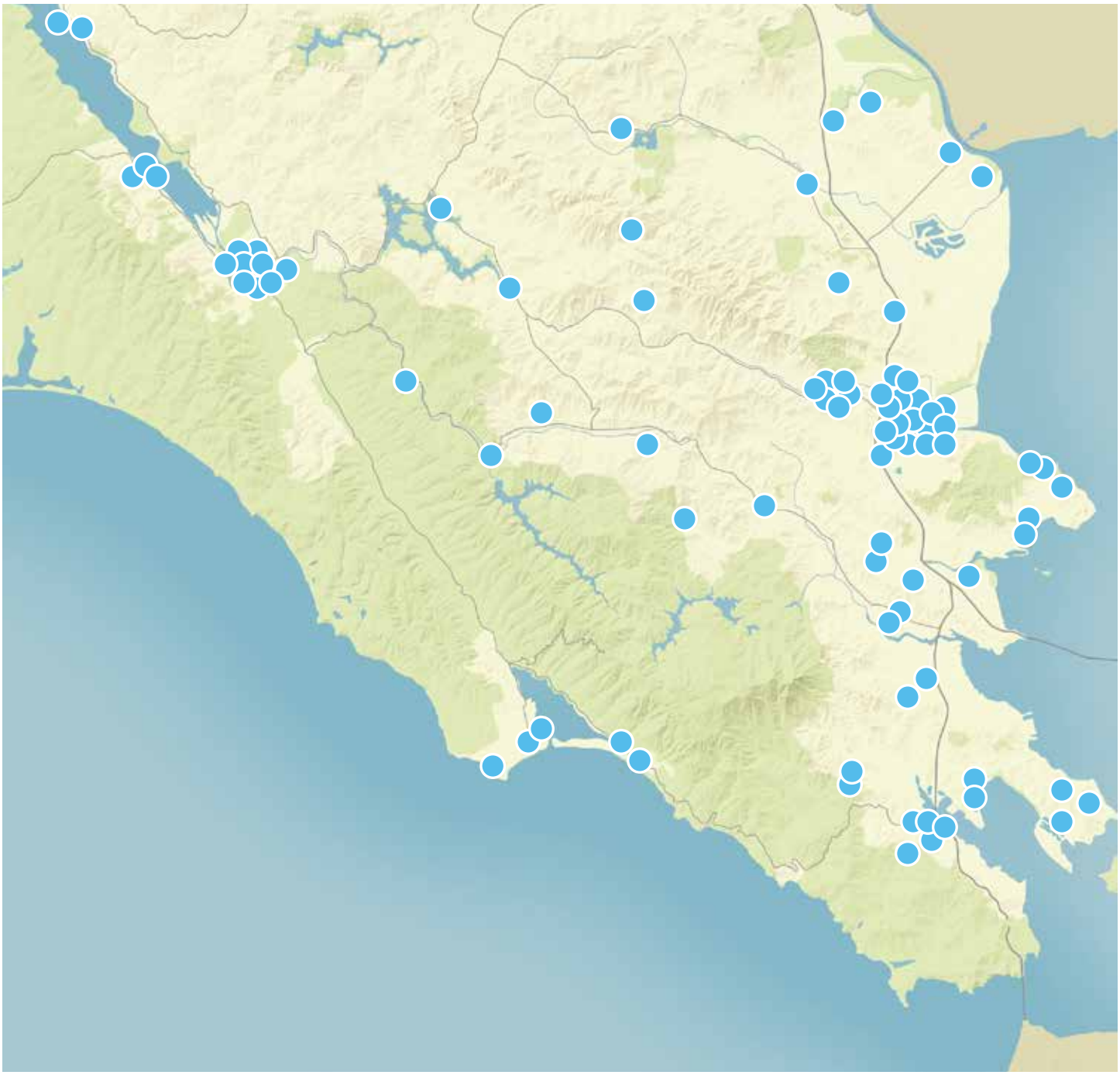
Marin County's IPM program continues to evolve, based on best practices, shared knowledge, and pilot programs. From July 2016 through July 2017, Marin County piloted a program to use zero glyphosate on traffic medians and roadside landscapes. The results of this study and other efforts continue to help refine the county's IPM program. Glyphosate has been removed entirely from the Marin County IPM program's list of allowable products for landscape and structural use in 2018.

Ornamental landscape IPM differs from wild land management. Keeping a playground or golf course healthy for recreational use is vastly different from managing large tracts of open space, where invasive plants can fuel wildland fires and put endangered species at risk. Marin County Open Space Preserves, which is governed by the Parks and Open Space Commission, are not covered in this report.

Nature is always changing. To optimize well-being for the people, plants, and animals in Marin County, our IPM solutions must be flexible, adaptable, varied, and specific to distinct and diverse locations.

IPM Governance

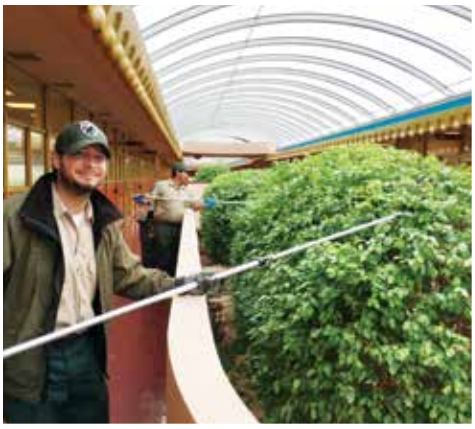
Marin County Ordinance 3598 governs park, structural, and ornamental landscape IPM for 147 locations.



County ordinance 3598 governs IPM for parks, libraries, fire stations, office buildings, traffic medians, other buildings, and other ornamental landscapes on county properties across Marin.

2017 Achievements

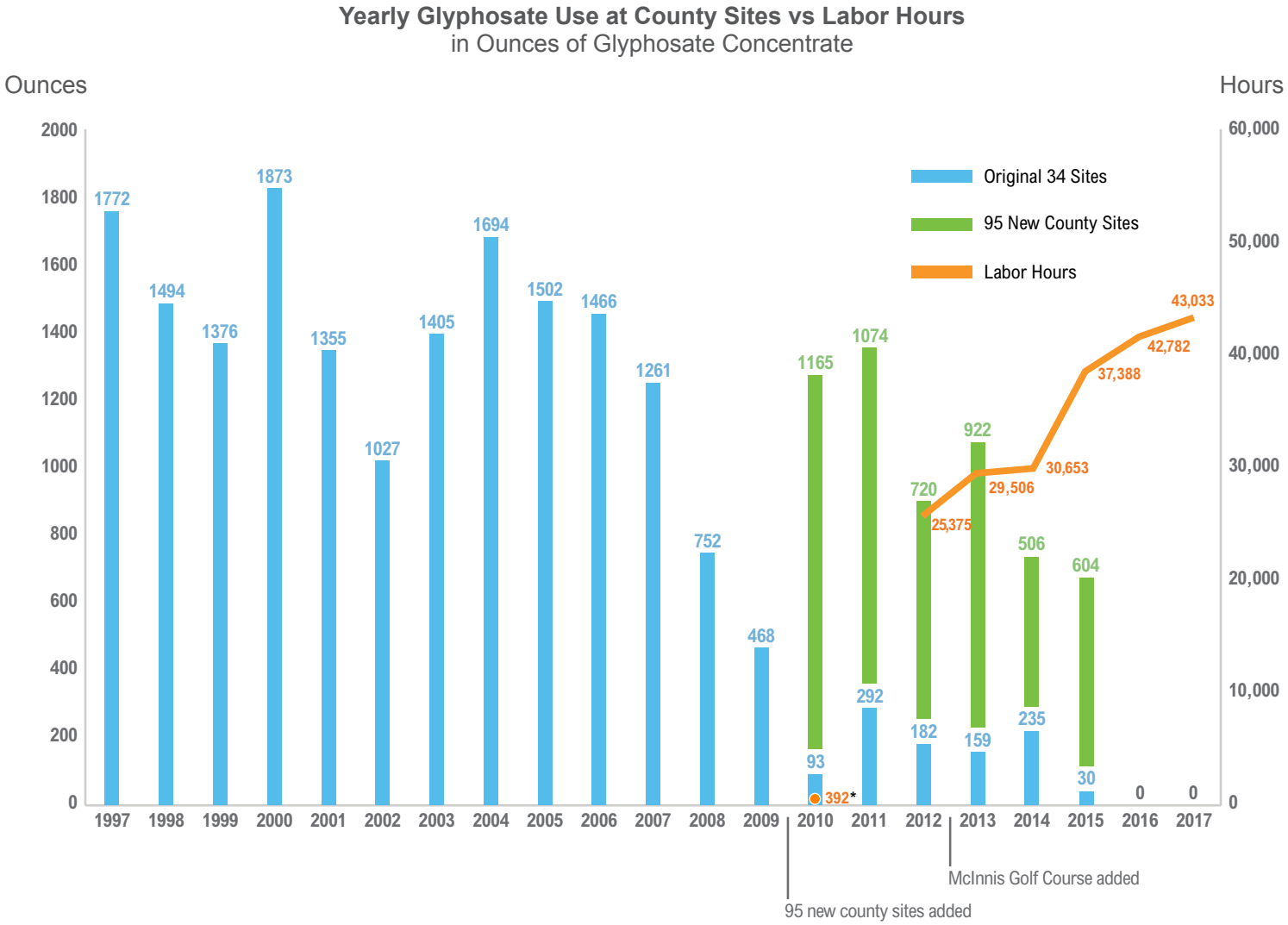
In 2017, Marin County maintained 147 locations including 126 without pesticides.



These sites include the Marin County Civic Center campus, 2 boat launches, 4 regional parks, the Marin Health and Wellness Campus, the McInnis Golf Course, dozens of neighborhood and community parks, 11 multiuse pathways, 27 traffic medians and roadside landscapes in 8 county service areas, county government offices, 2 libraries, and the county jail.

History of Glyphosate Use

Glyphosate Use Has Declined to Zero Over Time While Labor Continues to Increase



Over the past 20 years, glyphosate use has declined to zero. Gardeners Guild, a contractor that conducts Marin County IPM on median and roadways, has been an instrumental partner in achieving this goal.

The data for the years 1997-2014 is based on combined usage records at the original 34 county sites that were included in the 1998 IPM Ordinance. In 2009, 95 new county sites were added to the IPM Ordinance, and the McInnis Golf Course was added to the program in May 2012. Staff began comprehensively tracking labor hours in 2012.

* 2010 labor data is only available for the month of December.

2017 Achievements

In 2017, Marin County IPM program used zero glyphosate-based products.

No glyphosate was used in any Marin County Parks in 2017.

Marin County Parks is committed to rodenticide free IPM.

By eliminating rodenticides, Marin County keeps parks healthy for people, as well as wildlife that consume rats and mice. Rat and mice **trapping** continued to minimize rodent damage. In 2017 there were very few reports of rodent sightings or damage. Contractors like ATCO Pest Control and Crane Pest Control help control insects and rodents in a safe and environmentally sensitive manner.

Owl boxes at various park sites, including Civic Center, continued to be maintained and productive, housing owls that aided rodent control. Ground squirrel burrows can weaken building foundations, damage utility lines, and cause trip hazards. When a risk was identified, **burrow modification** and trapping helped manage ground squirrels.

Other pests are also addressed with an organic-first approach. Predatory yellowjackets have venom that can cause life-threatening anaphylactic shock. In an effort to protect the public and staff **yellowjacket traps** are systematically and routinely placed in early spring in nests adjacent to picnic areas, trails, or pathways. Other IPM options are used only when yellowjackets continue to threaten visitors or staff. Marin County IPM is bee-friendly and does not use any methods to treat bees.

Public health concerns require controlling rats, mice, and yellowjackets in County parks.

In 2017, a pilot project demonstrated that traffic medians could be maintained without glyphosate.

7 traffic medians were included in a zero glyphosate pilot project in 2017, for a total of zero glyphosate used for all 27 traffic medians and roadside landscapes.

Non-chemical IPM requires creative solutions and hard work.

Marin County IPM staff and contractors have shown great willingness to think outside the box and put in some elbow grease. A commitment to non-chemical IPM means more time spent mulching, weeding, weed-whipping, flaming, pruning, and adjusting irrigation to prevent weed growth. Contractors like The Shooter Co., Coast Landscape, Inc, and Gardeners Guild have been instrumental in helping us achieve our goals. Additionally, Marin County continues to network collaboratively with other government and regional agencies to navigate through shared challenges and share results.

From July 2016 through July 2017, Marin County conducted a pilot program using zero glyphosate on 7 traffic medians and roadside landscapes. Gardeners Guild, a contractor that conducts Marin County IPM on median and roadways, was willing to take up the challenge. Four seasons of data indicated that these methods can effectively address median weeds without affecting driver visibility and safety. The trade-off is that lane closures incur additional costs, additional labor is needed, and the visual aesthetics will change because some non-harmful weeds may be allowed to remain. Given the results, Marin County will continue to move forward without glyphosate on all 27 median and roadside landscapes in 2018.

2016 IPM Achievement Awardee: Pablo Rosales

Due to his persistence and willingness to work creatively, Pablo Rosales, groundskeeper at McInnis Golf Course, received a 2016 IPM Achievement Award. McInnis is one of the only golf courses in the north bay that is maintained with organic methods. Mr. Rosales received his award in April 2017.

Hand weeding, flaming, and hand mulching are all part of the Marin County IPM program.

2017 Achievements

While overall IPM labor hours slightly increased in 2017, volunteer hours increased by 33%.

Labor Hours by Month

Month	Staff IPM	Volunteer IPM	Contractor IPM	Total Hours
January	1857	1138	682	3677
February	1568	659	687	2914
March	2611	734	688	4033
April	2490	1274	720	4484
May	2717	639	747	4103
June	2683	453	737	3873
July	2292	802	730	3824
August	1963	802	758	3523
September	1902	1578	675	4155
October	2010	441	747	3198
November	1621	353	680	2654
December	1338	566	691	2595
Total Hours	**25,052**	**9,439**	**8,542**	**43,033**

Labor Hours Year-Over-Year

Year	Staff IPM	Volunteer IPM	Contractor IPM	Total Hours	% Change
2013	13,905	7,654	7,949	29,506	**---**
2014	15,774	6,678	8,201	30,653	**3.7%**
2015	20,718	7,983	8,687	37,388	**21.9%**
2016	26,888	7,086	8,808	42,782	**14.4%**
2017	**25,052**	**9,439**	**8,542**	**43,033***	**.58%**

The County maintains a strong commitment to Integrated Pest Management that emphasizes alternative, least toxic methods. Mechanical and manual weed removal, sheet mulching, mowing, trapping, turf aeration, irrigation system improvements, and other site modifications are used in combination to help control various pest populations.

* Equal to 20 full-time staff.

Community partnerships are essential to Marin's IPM program.

In total, volunteers and community partners contributed almost 9,500 labor hours to the Marin County IPM program in 2017, up 33% from 2016. The Marin County non-chemical IPM program would not be possible without community partners including the Invasive Spartina Project (ISP), the One Tam volunteer program, the Linking Individuals to their Natural Community (LINC) youth stewardship program, Students and Teachers Restoring a Watershed (STRAW), local STEM (Science, Technology, Engineering, and Math) students as well as other school groups, corporate groups, and other non-profit service and community groups.

Neighborhood-level partners are also contributing creative solutions. A local community-driven project called Yard Smart Marin launched in 2017 to create a public service campaign called "Think Before You Spray" aimed at reducing pesticide use at the neighborhood level. While this is not a Marin County IPM effort, the community commitment is noteworthy.

2017 IPM Achievement Awardee: Broom Service

The IPM Achievement Award recognizes individuals and organizations that further the goal of eliminating pesticide use within the Marin County IPM Program.

The 2017 award was given to Broom Service, a group of volunteers who work tirelessly to eradicate invasive French and Scotch broom in San Geronimo Valley.

Community-driven efforts like Broom Service, the "Think Before You Spray" campaign, and One Tam volunteer events complement IPM staff and contractor efforts to reduce weeds, pests, and pesticide use in Marin County.

20 full-time employee equivalents supported non-chemical IPM.

In 2017, staff, contractors, and volunteers spent 43,033 hours conducting IPM, equal to 20 full-time employees.

Volunteers spent 9,439 hours **weeding, picking up litter, spreading mulch, removing invasive species,** and performing other non-chemical methods in support of the County's IPM program. Staff, contractors, and volunteers spread over **300 yards of mulch** and installed **hundreds of square feet of cardboard sheet mulching,** in an effort to offset synthetic herbicide use.

Turf management practices, including **fertilization, verti-cutting, topdressing, over-seeding and irrigation,** have maintained acceptable levels of weeds and disease in turf areas.

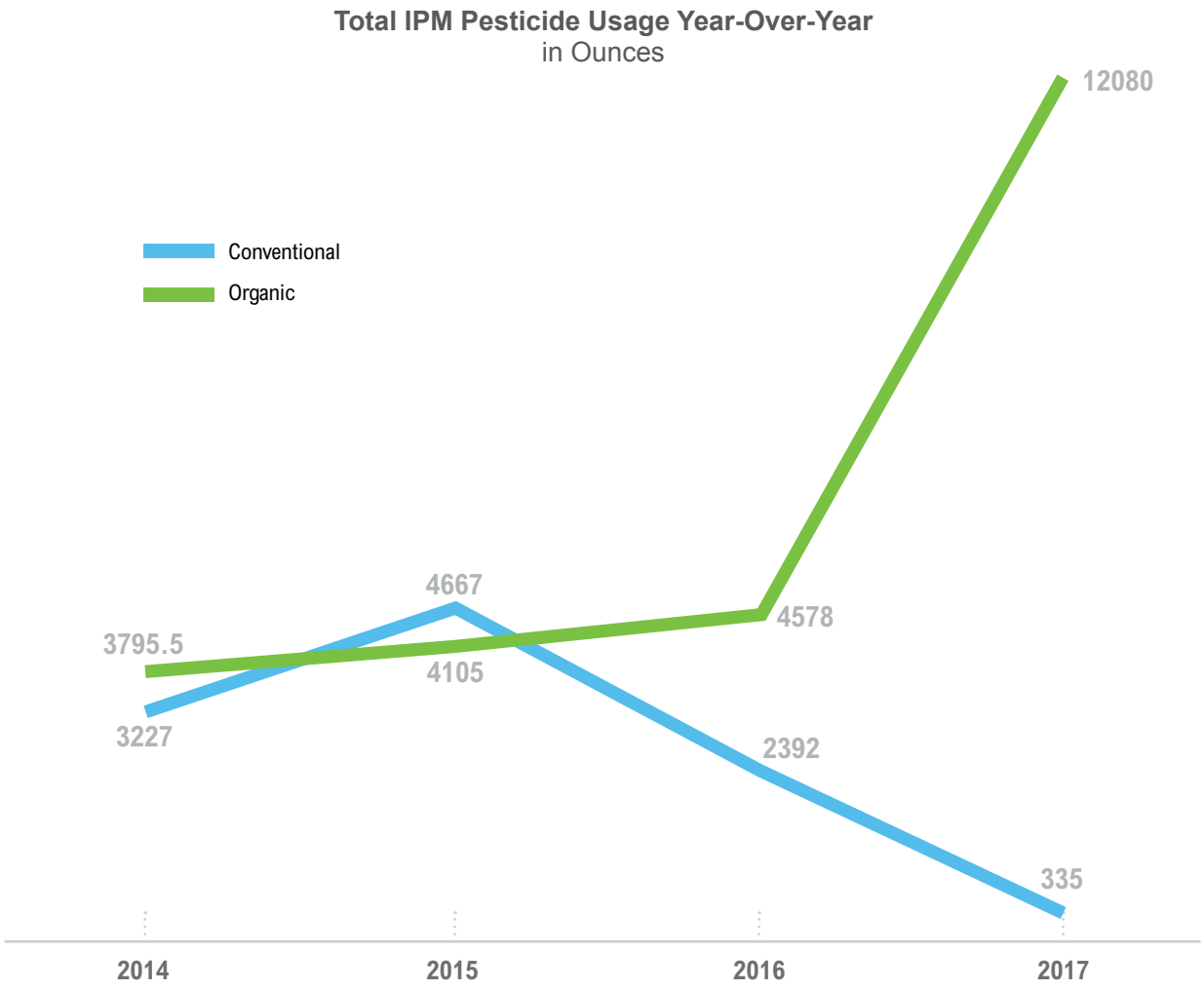
2016 IPM Achievement Awardee: Ann Spake

Ann Spake of Sustainable TamAlmonte vigorously advocated for the health of Marin residents, both domestic pets and wildlife, and use of the least harmful methods in IPM practices. She engaged the IPM Commission and organized members of the public to support and advocate a progressive approach to IPM that resulted in reduction of synthetic pesticide use within Marin County.

Non-chemical IPM requires hands-on field work and specialized tools.

Total Pesticide Use

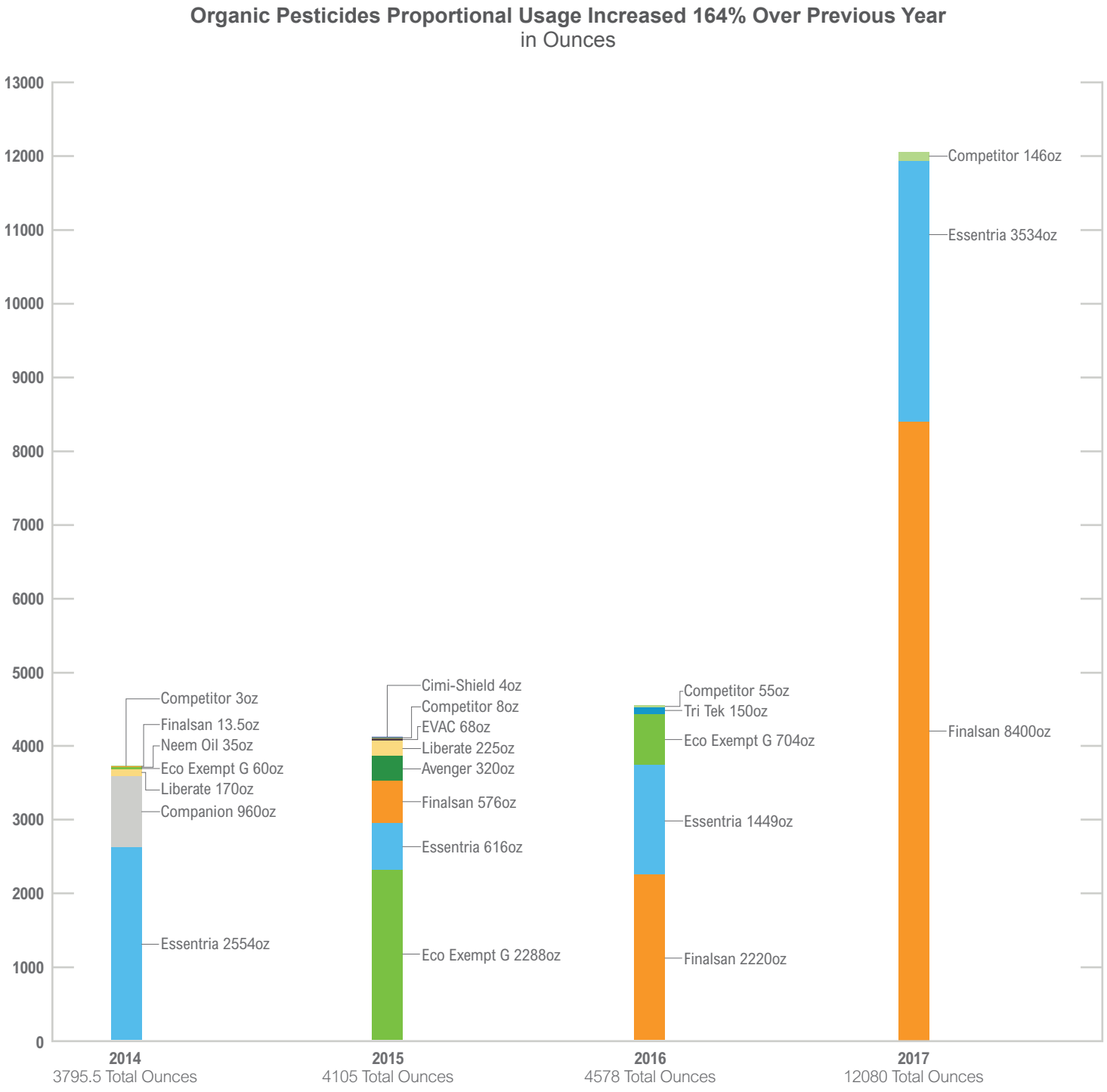
Conventional pesticide use declined again in 2017 while organic use increased.



Conventional pesticide use declined by 86% in 2017 over the previous year while organic pesticide use increased by 164%. The long-term strategy is to favor manual methods supplemented with organic treatments while minimizing the need for synthetic chemical applications.

Conditions this year again allowed Marin County Parks to successfully implement IPM using a minimal amount of synthetic chemicals. Organic alternatives require a significantly higher application rate than conventional products, and are primarily used on traffic medians. IPM will vary each year based on the types of pests, risks, and conditions in the field.

Organic Pesticide Use



The diagram above shows organic pesticide applications over the past four years. The total amount of organic product usage increased by 164% in 2017, which is offset by the 86% decline in the use of conventional products. Organic alternatives require a significantly higher application rate than conventional products. Only 3 products were used in 2017, though this could change in future years depending on the conditions and type of pests.

Organic product alternatives were an integral component of IPM in 2017.

Organic* Products Used for Outdoor Landscape Maintenance

Competitor is a surfactant, a substance that is added to a liquid to reduce its surface tension, thereby increasing its spreading and wetting properties. It was mixed with other products like Finalsan to increase efficacy. It was applied to weeds growing at the Bon Air Road and Sir Francis Drake Boulevard traffic medians, the Health and Wellness Campus at Kerner Boulevard, County Service Area 16 in Greenbrae, Rush Creek Frontage Road, McInnis Park, the Health and Human Services building on North Redwood Drive, Alameda Del Prado, and Hal Brown Park.

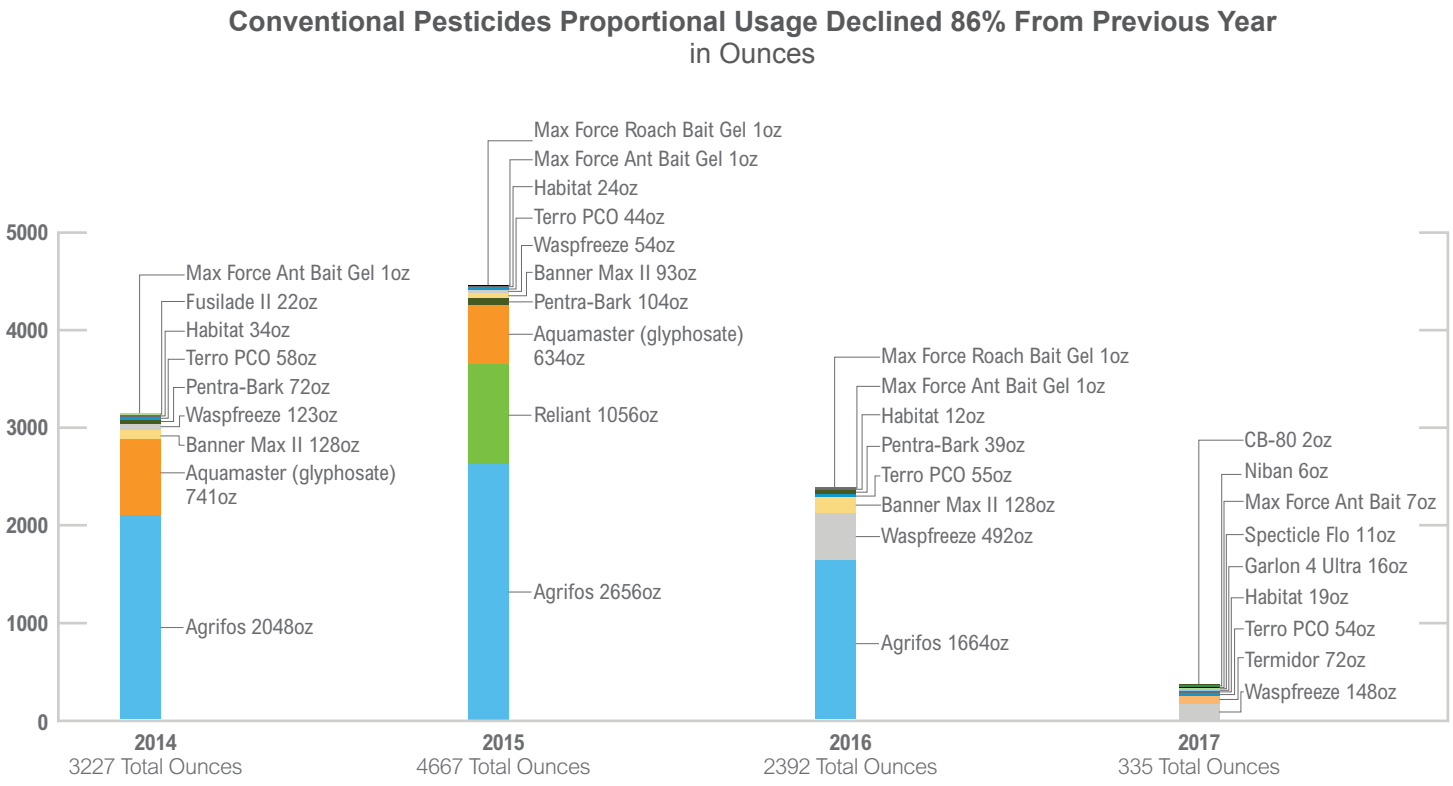
Finalsan is a fast-acting herbicide used as a glyphosate alternative for weeds. Its active ingredient is ammoniated soap of fatty acids. It was applied to weeds growing at the Bon Air Road and Sir Francis Drake traffic medians, County Service Area 16 in Greenbrae, Rush Creek Frontage Road, McInnis Park, the Health and Human Services building on North Redwood Drive, Alameda Del Prado, and Hal Brown Park. This product has proven to be more effective than Avenger. However, efficacy is significantly reduced when ambient temperatures are cool and weeds are larger than two to four inches.

Organic* Products Used for Indoor Structural Pest Control

Essentria is an organic, broad-spectrum 25(b) insecticide available in liquid (IC3) or granular (G) form. Active ingredients include essential plant oils such as rosemary and peppermint. It was used to treat crawling insects at the Marin County Garage, Marin County Juvenile Services Center and the Marin County Juvenile Hall on Jeannette Prandi Way, the Marin County Civic Center, the county office building at 1600 Los Gamos Road, the Marin County Jail, Health and Human Services facilities, and Gnoss Airport.

* Product verified by the Organic Materials Review Institute (OMRI) to meet federally-regulated organic standards used by certified organic food and fiber producers.

Conventional Pesticide Use



The diagram above shows conventional pesticide applications over the past four years. Overall, the use of conventional pesticides dramatically declined with 86% less conventional product applied in 2017 compared to the previous year.

This is in keeping with the long-term strategy is to favor manual methods supplemented with organic treatments while minimizing the need for synthetic chemical applications. IPM will vary each year based on the types of pests, risks, and conditions in the field.

A full list of allowable organic and conventional pesticides is available at www.marincountyparks.org.

Conventional Pesticides Applied in 2017

In 2017, Marin County Parks decreased application of conventional products.

Conventional* Products Used for Outdoor Landscape Maintenance

Garlon 4 Ultra is used to treat woody weeds on a limited basis via spot treatment or injection. It was used on cut eucalyptus stumps at Ashton Lane in Tamalpais-Homestead Valley.

Habitat is an herbicide formulated specifically for aquatic and riparian areas. It is used in spot treatment as part of the Bay area wide invasive Spartina project as well as for other invasive grass and woody species. It was applied at McInnis Park to treat pepperweed and at Creekside Marsh at Hal Brown Park to treat Spartina.

Specticle FLO is a reduced-risk pre-emergent herbicide for the control of annual grasses, sedges, and broadleaf weeds. It was applied to traffic medians on Sir Francis Drake Boulevard.

Waspfreeze and WaspFreeze II applications were made to as few nests as possible, and only when a yellowjacket nest posed a health risk to the public or staff. WaspFreeze II was used after the Wasp Freeze product was discontinued. These products were applied in limited quantities at Paradise Beach Park, Stafford Lake Park, Lucas Valley Park, McNears Beach Park, the Corte Madera Library, and the county-owned building at 1600 Los Gamos Road.

In general, our landscape IPM promotes a tolerance for weeds in appropriate settings, since weeds can be a part of healthy ecosystems and play a key role in supporting pollinators.

Conventional* Products Used for Indoor Structural Pest Control

CB-80 was used to control flying insects. A very small amount (2 oz) was applied in violation of the IPM ordinance.

Max Force Ant bait gel was used to control insects at Marin Center Exhibit Hall through controlled bait stations.

Niban uses boric acid, a low-toxicity mineral, to control insects. It was used to treat fruit flies at the Marin County Jail.

Termidor SC was granted an exemption to be used to treat termites at the McNears Beach Park snack bar foundation. The exemption was granted because this product has been shown to be more effective against subterranean termites than other product alternatives.

Terro PCO was used to aid controlling ants and other crawling insects at Gnoss Airport, the Marin County Juvenile Hall, and two Health and Human Services Campus buildings on Kerner Boulevard. This product uses borax as its active ingredient and was used in protected bait stations.

* 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, the Marin County IPM program lists it as “conventional,” even if the active ingredient is naturally occurring.

The number of violations and exemptions remained low in 2017.

County Ordinance 3598 governs the Marin County IPM program. Any events that differ from the policies laid out in the ordinance are considered violations.

Violations

1. On May 26, 2017, Crane Pest Control applied Essentria IC3—an exempt product with the active ingredients rosemary oil, peppermint oil, and geraniol— at the 1600 Los Gamos complex in order to control crawling insects. Although this product is on the 2017 Marin County Integrated Pest Management Allowed Pesticide List, Crane failed to follow protocol to request a pesticide application and submit the proper notifications to alert the occupants of the complex regarding the pesticide treatment. Failure to request permission and post notification of a pesticide application constitutes a violation of the IPM Ordinance and Policy and was reported as such at the July 28, 2017 IPM Commission Meeting.
2. On July 13, 2017, at the Marin Civic Center exterior landscapes, ATCO Pest Control made a 2oz. application of CB-80—a pesticide used to control flying insects. This product contains the active ingredient pyrethrin and is not on the 2017 Marin County Integrated Pest Management Allowed Pesticide List. Failure to request permission and post notification of a pesticide application—or to apply a pesticide that is not on the 2017 Marin County Integrated Pest Management Allowed Pesticide List—constitutes a violation of the IPM Ordinance and Policy and was reported as such at the October 27, 2017 IPM Commission Meeting

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

Exemptions

1. On April 3, 2017, an exemption was issued for the product WaspFreeze. This exemption was issued for use of the product with less than 4 days prior notice in emergencies due to the threat of severe allergic reactions from stings. The active ingredients are Allethrin and Phenothrin. Typical application is 17.5oz (1 can) per nest, and traps were also placed and monitored throughout parks.
2. On April 21, 2017, an exemption was issued for the product Termidor SC after an inspection of the snack bar structure at McNears Beach Park revealed the presence of a termite colony. ATCO Pest Control found evidence of termites in the foundation of the structure and recommended the use of Termidor SC. This product is effective against subterranean termites, while other alternatives contain a contact termicide and are ineffective against underground termites due to the lack of residual effects. The active ingredient is Fipronil (9.1%) and is listed by US EPA as a probable carcinogen. This product is applied by drilling borings into the ground adjacent to the structure, and injecting a liquid into the substrate.
3. On August 22, 2017, an exemption was issued for the product PT WaspFreeze II. This exemption was issued because our previous wasp product—Wasp Freeze—was discontinued. This new product contains a similar active ingredient (Prallethrin, a pyrethroid) but has a different EPA number. The exemption was granted for the remainder of 2017, for blanket use of the product with less than 4 days prior notice in case of emergencies. Typical application is 17.5oz (1 can) per nest.

Proposed Changes to 2018 Products List

Organic products continue to evolve.

2018 Proposed Product Addition

Marin County Parks proposes the addition of two organic landscape products, and one conventional product.

Azaguard is an Organic Materials Review Institute-certified (OMRI) Neem-based product for control of indoor and outdoor insect pests; this replaces the similar product Azatrol EC as it is no longer available.

Civitas is also an OMRI-certified product containing mineral oil, and is used as a fungicide and insecticide for turf on golf courses, sports and athletic fields.

PT Waspfreeze II is a conventional insecticide used for emergency wasp nest treatments in ground or aerial wasp nests posing a significant hazard to the public. This product replaces Wasp Freeze as it is no longer available.

There are two structural products proposed for use in 2018.

Rat Ice is an organic product containing dry ice, which controls rats in burrows by releasing CO2.

DominAnt is an insecticide for treating ants and other crawling insect, and is applied in secured bait stations only. This product is listed as an EU Endocrine Disruptor, and replaces the product Terro PCO as it is no longer available.

2018 Proposed Product Eliminations

Marin County Parks proposes the elimination of **Roundup Custom** and **Rodeo**, both with the active ingredient glyphosate. Following the successful implementation of the glyphosate-free pilot program on traffic medians and frontages, staff have continued to focus on other manual (non-chemical) weed control and emerging organic chemical treatments in these areas.

Consistent with the IPM ordinance and policy, glyphosate and other synthetic chemicals will still be considered for use on IPM ordinance sites via the exemption process for emerging pest threats. These would only be used as a tool for **three critical uses**: 1. Protect critical habitats and endangered species; 2. Protect communities against the threat of wildfire, and; 3. Protect local agriculture from threats such as invasive barbed goatgrass.

Education and knowledge sharing strengthen the IPM program.

Annual Training

Ten Parks and Landscape staff currently hold their Qualified Applicators Certificate (QAC), which provides a technical and safe knowledge-base in the event pesticides applications are needed. Individuals holding this certificate are required to complete 10 hours per year of continuing education on the topics of IPM and other landscape-related issues. In addition to this cumulative 100 hours per year of staff development, approximately 25 Parks and Landscape staff members involved with IPM participate in an annual 4-hour training program focusing on the **Safe Handling and Use of Pesticides**. The four-hour class includes:

- use of OMRI (Organic Materials Review Institute) and commercial pesticide applications
- proper use of equipment
- personal protective gear
- organic alternatives to commercial chemicals
- best management practices to reduce the need for applications
- mapping sites
- monitoring
- reading pesticide recommendations
- reading a chemical label

Other training topics include:

- IPM methodology and practices
- calibration of equipment
- laws and regulations
- insect and weed identification
- turf management
- plant diseases
- proper sheet mulching
- best management practices

Ongoing Training

Throughout the year, staff also attended **trainings on emerging IPM products, laws and regulations, and best management** practices. This year topics included:

- Sudden Oak Death management and preventative treatment
- plant health care
- use and impacts of organic mulch
- use of owls as a component of an IPM program
- rodent control methods
- soil composition and analysis

Knowledge Sharing

Staff routinely participated in **meetings with other Bay Area IPM personnel** to discuss current issues, alternative IPM methods, new products, best management practices, and the science behind IPM. This included:

- City & County of San Francisco Department of the Environment Technical Advisory Committee
- California Weed Science Society meetings

Marin County IPM Trends and Emerging Threats

Proactive planning. Japanese Knotweed, a fiercely invasive plant from Asia, has been found in Marin County, but not yet on land owned by the County of Marin. Staff are working proactively to develop plans if highly invasive and extremely harmful pests like this emerges.

Early detection. Marin County's IPM staff works closely with the Marin County Department of Agriculture, Weights and Measures and the University of California Cooperative Extension to diagnose emerging threats. Once identified, Marin County responds rapidly to the threat while collaborating with other agencies on shared solutions.

Multi-faceted solutions. Targeted sites often require phased, multiple methods, with higher levels of monitoring and treatment frequency. Conventional product applications continued to decline, being reserved for critical use when other options are not feasible.

Data-driven IPM. Pilot programs, shared reporting among IPM practitioners, monitoring, and analysis of organic methods are helping to identify the most effective and ecologically sound solutions.

Physical labor. Non-chemical IPM depends on persistent hands-on work, such as digging out, hand pulling, and weed wrenching. Successful ecological IPM requires more person hours.

Weed tolerance. Public perceptions of a well-manicured ornamental landscape may need to shift, to accommodate healthy ecosystems maintained without pesticides that include non-harmful weeds.

Climate change. Drought, temperature shifts, extreme weather, and rising sea levels are bringing new challenges, as some ecosystems struggle to adapt and become more susceptible to pests and disease.

Fire. With increased temperature comes increased threat of fire. Because our parks, county offices, and roadside landscapes border residential areas, community safety must continue to be a top priority in our control of invasive pests. Plans must accommodate threats such as the accumulation of dead trees from sudden oak death and French broom, a plant that acts as a ladder fuel for fire.

Marin County Parks continuously tracks new developments in IPM, to evolve and adapt its program.

Marin County Parks IPM Team

Kirk Schroeder directs volunteer group at Hal Brown Park

Jim Chayka
Parks and Open Space Superintendent, Integrated Pest Management Program Coordinator

Jim Chayka has worked for 20 years in the fields of natural resource management, watershed restoration, and environmental stewardship. Prior to joining Marin County Parks, Jim served as Director of Natural Resources at Conservation Corps North Bay—a regional program dedicated to developing and engaging youth through environmental stewardship. As a consultant with Watershed Sciences and the Urban Creeks Council, Jim spent 10 years as a fluvial geomorphologist supporting research and restoration efforts throughout Bay Area watersheds. Jim has also held leadership positions with Fire Safe Marin, East Bay Conservation Corps, the Student Conservation Association, and the Sonoma Ecology Center.

Jim holds the following degrees, licenses, and certifications: a BA in Political Science and a MS in Geosciences; Parks and Recreation Professional (CPRP) certification through the National Recreation and Parks Association; C-27 Landscape Contractors License; Qualified Stormwater Pollution Plan Developer & Practitioner (QSD/QSP); Certified Professional in Erosion and Sediment Control (CPESC).

Albert Hom
Integrated Pest Management Specialist

Albert Hom has spent over 20 years in the field of Integrated Pest Management (IPM). Before joining Marin County as the Integrated Pest Management Specialist in 2014, he held positions as an Entomologist, IPM Coordinator, Senior Public Health Biologist and Program Manager. He has a Bachelor of Science in Biology and a Masters of Public Administration from California State University, Hayward. He is a Pest Control Advisor, Board Certified Entomologist, and a Registered Environmental Health Specialist.

Kirk Schroeder
Volunteer Program Coordinator

Kirk Schroeder has worked at Marin County Parks for 17 years, and has 11 years 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.

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 organic standards. In the United States, the term "organic" is federally regulated and governed by standards in the Code of Federal Regulations when used on 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.

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 "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.

Rodenticide. A substance or preparation used to control mice and other rodents.

TRAYLOR, MARIAN

Subject: FW: Products

ADDITIONAL DOCUMENTS

From: Kim Konte [mailto:kkonte@mac.com]
Sent: Tuesday, March 13, 2018 1:08 PM
To: SETHURAMAN, RAJA <RAJA.SETHURAMAN@costamesaca.gov>
Cc: Bob Johnson <bobc.johnson@icloud.com>
Subject: Products

Hi Raja,

It was nice meeting with you this morning and learning how much your department has already done to protect Costa Mesa's residents and environment.

Please find below the synthetic and non-selective options we discussed to replace glyphosate for weed control in your medians and hardscape(until we have a cost effective, and proven organic option):

Non Toxic Irvine
www.nontoxicirvine.org

Synthetic(non-selective) herbicides for medians and hardscape:

Products	
Envoy Plus	https://www.valent.com/Data/Labels/2007-ENVP-0001%20-%20Envoy%20Plus%20-%201612-B.pdf
Fusilade 11	https://www3.epa.gov/pesticides/chem_search/ppls/000100-01084-20140218.pdf
Habitat	https://www3.epa.gov/pesticides/chem_search/ppls/000241-00426-20110817.pdf

Best,
Kim
Non Toxic Irvine
Jane Goodall's Roots & Shoots
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