CITY OF IRVINE

Integrated Pest Management Program

2017 Annual Report

Introduction

The City of Irvine continued to implement the Public Works Integrated Pest Management Program (IPM) adopted by the City Council in February 2016. This policy set forth the following goals:

Citywide Pest Management Guiding Principles

a) Use of organic pesticides in all City properties.
b) Limit exposure to any pesticides where children and the general public congregate.
c) Incorporate additional guidance on use of pesticides for city rights of way, facilities, and other properties as reflected in the February 23, 2016 staff report.
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 that we would have.

This report presents the 2017 IPM program activities and application data. The IPM Program applies to all City departments, although the majority of pest management responsibilities fall within the Public Works Landscape Division.

Program Components

The City of Irvine IPM Policy promotes environmentally sensitive pest management practices while preserving assets and protecting the health and safety of the public and City employees. All costs and impacts associated with pesticide use, including community and environmental health, will be considered.

IPM is a decision-making process for managing pests that use monitoring to determine pest levels and tolerance thresholds and combines biological, cultural, physical, and chemical tools to minimize health, environmental, and financial risks. The method uses extensive knowledge about pests, such as infestation thresholds, life histories,

environmental requirements, and natural enemies to compliment and facilitate biological and other natural control of pests.

As part of an IPM program, pesticides may be used when pest thresholds get too high. The definition of a pesticide is any substance, or the mixture of substances, used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest, which may be detrimental to vegetation, humans, or animals. Regardless of the pesticide being organic or synthetic, the goal is to rid a pest and caution must be taken when applying the product.

To ensure that the IPM program continues to be an adequate tool to meet the City's pest challenges while upholding the program goals adopted by the City Council; staff continuously examines and evaluates components of the program effectiveness. In addition, all contractors that apply pesticides on the City's behalf are required to subscribe to the IPM Policy.

Alternative Pest Control Projects

The Public Works Landscape Division employs alternative methods of weed control such as mechanical removal through mowing and hand pulling. City landscape maintenance contractors provide approximately 22 full-time equivalent employees to hand pull weeds in City parks and public roadway right-of-ways. Other non-pesticide weed control measures include the application of mulch in landscape planter areas to minimize weed growth and operating Smart irrigation controllers to apply the proper amount of water to City landscapes, which minimizes disease and weed growth, thus limiting pesticide use. City contract services have also moved away from pesticides in drainage facilities to utilizing manual removal of cattails to ensure proper water flow with no pesticide residue.

The City is responsible for maintenance of some fuel modification zones in the Village of Turtle Rock and an open space area in the City of Newport Beach. The use of motorized weed cutting tools is utilized to manage these zones. The Landscape

Division plans to test the effectiveness of goats in City open space in 2018 and compare the results to existing practices.

The Landscape Division also utilizes biological control to reduce pest populations. Biological control uses organisms often referred to as beneficials, natural enemies or biocontrols. They act to keep pest populations low enough to prevent significant economic damage. The most common organisms used for biological control in landscapes are predators and parasites. In 2017, the City contractor released close to one million beneficial insects in the parks and streetscapes to combat destructive pests, instead of relying on pesticides.

Another method employed by staff to control pests is habitat modification which was used on a few median planters in the Spectrum area. Small rodents, called voles, were damaging the landscape groundcover and control with an organic repellent was unsuccessful.

As an alternative to higher level pesticide application, the City's landscape maintenance contractor converted the landscape palette to a ground cover type that deters the vole activity. This project eliminated the need for any pesticide and improved the overall appearance of the street median.

Example of successful habitat modification.

Parks, Fields, and Playgrounds

Since the Policy implementation, the Landscape Division has successfully managed a healthy turf grass population with no weed killer applications on any turf areas. The City has continued the practice of not using “Speedzone” (2, 4-D) and “Round-Up” (glyphosate) weed killers.

The practice of using contract labor to mechanically and manually control weeds has proven effective in the parks. In addition, organic products have provided adequate control for insects and algae. However, the use of traps for rodent control has not been effective for ground squirrels and rats. Going forward, staff will transition to organic baits in secured boxes, per the tiered approach of the IPM Policy, to control rodents on City park property.

Table 2, Appendix 1 shows the pesticide usage in parks and athletic fields since 2015 for weeds, algae and disease control. Tables 3 and 4, Appendix 1 highlight the number of pesticides used for rodent and insect control since 2015.

Right-of-Way

For right-of-way weed control, the City's landscape maintenance contractors were effective at controlling a majority of the weeds using organic products. For approximately 100 acres of non-landscaped areas (concrete medians and sidewalks), weekly treatments during the spring months and bi-weekly treatments the rest of the year provided satisfactory control. For approximately 900 acres of landscaped medians and parkways, manual hand weeding still remains a priority to limit pesticide usage. However, the vast acreage, rapid regrowth of perennial weeds, and the abundance of weed seed that gets dispersed daily by winds and traffic limits the City's ability to completely control weeds in these areas. The presence of perennial weeds, nutsedge, field bindweed and Bermuda grass equates to roughly five percent of the weed population not successfully controlled by the current maintenance practice.

Nutsedge in a street median that has overtaken the desirable plant material.

These weeds have extensive vegetative root systems that require systemic activity to control not only the top growth but the aggressive underground roots as well. The use of selective and systemic synthetic products to adequately control perennial weeds will be evaluated in 2018 in limited areas not readily accessible to the public, primarily street medians.

Field Bindweed has woven itself into the ground cover, making it impossible to control with non-selective organic products.

Selective and systemic weed killer products only affect the weed and not the desirable plant material surrounding the weed. The weed killer enters the plant through the leaf and moves throughout the weed for a complete eradication. Organic products available for use at this time are neither selective nor systemic. The organic products burn down all foliage they come in contact with, including desirable plants.

Bermuda grass sprayed with an organic product that burned desirable native grasses.

Table 5, Appendix 1 lists the pesticides used to control weeds in the right-of-way in 2015, compared to 2016 and 2017.

Using the products identified in Tables 3 and 4, Appendix 1, in the right-of-way areas for control of rodents and insect produced similar results as to what was achieved in Parks.

Public Facilities

The Facilities Maintenance Division of Public Works has implemented an integrated and tiered approach to manage pests in compliance with the City's IPM policy. Facilities maintenance personnel perform routine inspections to identify, report, and manage pest activity. Compliance has been achieved using monthly services provided by the City's existing pest control contractors and ongoing staff training. Staff communicates frequently with building operators and tenants to identify and control pest activity and is continually working with facility operators to improve food storage, sanitation, and waste management practices. Exclusion methods and barriers have been deployed at several City facilities to minimize pest intrusions and staff is dedicating additional time to pest management research, planning and response.

Facilities maintenance staff completed 59 requests for pest control service during the 2017 calendar year separate from the monthly services provided by the City's pest control contractor. The requests were logged in the division work order system. In response to an increase in rodent activity in the absence of pesticides, the use of snap traps was increased at several City facilities. Facility maintenance staff is tracking the use of rodent snap traps and will report the data in the next annual report. Staff is also documenting preventive pest related inspections, field reports, and service requests using the City's Computer Maintenance Management System (CMMS).

The Landscape Division has been working closely with Facilities Maintenance to reduce the density of foliage around facilities to minimize pest activity. The effectiveness of the modified program has provided control of the rodents in most cases. The program also

places an emphasis on controlling rodent, roach and ant activity at facilities routinely serving food to the public.

Behavioral and operational changes will play a key role in maintaining tolerable pest control under the new IPM Policy due to limited availability of compliant insecticides and rodenticides.

Staff is also evaluating non-toxic methods associated with the treatment of termites. The current treatment for termites has been removal and replacement of the affected portions of structures to remove termites. The overall pest program in Facilities Maintenance is working towards improvements in seasonal planning, preventive control measures, monitoring, and reporting to better assess and control pests.

Other City Properties

City open space and City farm lease property is also covered by the IPM policy. The City contracts with The Irvine Ranch Conservancy (IRC) for its open space management and IRC has incorporated the City's IPM policy into its maintenance protocols. Priority invasive species were removed or treated across approximately 405 acres, of which 275 were within the Natural Community Conservation Plan (NCCP) and an additional 130 acres were within non-NCCP open space boundaries. A total of 1,827 person-hours were spent on Open Space weed abatement control in 2017. Artichoke thistle continued to be a major target species due to past effort invested and the ability of this species to rebound without control. Efforts continued to expand to include other species, such as Sahara mustard, garland chrysanthemum, stinknet, and fountain grass. Invasive control activities were conducted by staff, contractors, and volunteers. No synthetic pesticides were used to control invasive species in 2017; only manual methods and organic pesticides were utilized. IRC experimented with using the organic herbicide Suppress® in controlling various annual and perennial weeds. 227 ounces was applied in seven treatments between January and May at the Quail Hill Restoration and Mule Deer Site. The Contractor determined that Suppress® was not an effective tool for their treatment of perennial and pernicious annual weeds and therefore reverted to use of manual control methods.

2017 marked the first year that the joint Invasive Plant Management Plan for the Coastal NCCP was implemented. The Plan prioritized control of more widespread species and focused in core areas within Shady Canyon. Early detection/rapid response was successfully implemented through NCC-funded surveys of all trails. Several species and populations were not treated because currently available tools and resources were inadequate to effectively control them. These include, but are not limited to pampas grass, tamarisk, larger remote stands of fountain grass, and perennial pepperweed.

Other City properties, including agricultural field leases managed by the City's Community Development Department, reported that all property leases were in compliance with the City's organic pesticide policy.

2017 Pesticide Use and Analysis

The City's contractors are all licensed by the State of California to use organic and synthetic pesticides, as required by their contracts with the City. As the party responsible to the State for the application for any pesticide, the City's maintenance contractors researched available organic products approved for use in the State of California. All products used were reviewed by the City's Maintenance Superintendents or Department Managers and approved prior to use. Due to the high acidity of the organic weed control products, applicators must use protective equipment to shield their eyes and skin which can sometimes give the public the perception the pesticide being applied is toxic. Table 1, Appendix 1 provides the active ingredient for the approved organic pesticides used in 2017.

IPM Program Cost Impacts

Manual hand weeding and organic pesticides require the use of more labor and product, and an increase in the frequency of applications to provide a similar result as compared to past pesticide practices. Table 6, Appendix 1 provides a comparative example of the difference in costs between the alternative organic pesticides.

The budget impact for 2017 remained in the range of 5.6% of the Public Works $21.2 million annual Landscape Maintenance budget with six newly bided landscape maintenance contracts that start in 2018. These contracts include the minimum wage increase mandated by the State to increase from $11.00 per hour to $15.00 per hour in 2022 and provide the necessary contract staff to manually remove pests and apply organic products.

All City staff involved with pest control will continue to evaluate non-toxic options to control pests and associated costs to adhere to the Citywide Pest Management Guiding Principles.

Appendix 1

TABLE 1 ORGANIC PESTICIDES			
PRODUCT	**ACTIVE INGREDIENT**	**TARGET PEST**	**EPA CATEGORY**
Avenger	Limonene citrus oil	Weeds	Caution
Fiesta	Iron HEDTA	Weeds	Caution
PreEmerge	Soybean Oil	Weeds	Caution
Finalsan	Ammoniated soap of fatty acids	Weeds	Warning
Scythe	Pelargonic acid	Weeds	Warning
Suppress EC	Caprylic acid	Weeds	Warning
Weed Pharm	Acetic Acid	Weeds	Danger
Rat X	Corn gluten meal	Rodents	N/A
Uncle Ian's Gopher Repellent	Dried blood	Gophers	N/A
Eco Exempt Jet	2 Phenethyl proprionate, Rosemary oil	Insects	N/A
WHY Spray	Lemongrass Oil	Insects	N/A
Eco Via EC	Thyme oil, rosemary oil , 2 phenethyl proprionate	Insects	Caution
Essentria IC3	Rosemary oil	Insects	Caution

TABLE 2 CITY OF IRVINE PESTICIDE USAGE SUMMARY PARKS AND ATHLETIC FIELDS					
LOCATION	**PRODUCT**	**PEST**	**TOTAL USE IN 2015**	**TOTAL USE IN 2016**	**TOTAL USE IN 2017**
Parks and Athletic Fields	3336 F	Disease	47 oz.	0	0
	3336 WP	Disease	4 lbs.	0	0
	Aqua Shade	Algae	2 gal	0	0
	Arrow 2EC	Weeds	10 oz.	0	0
	Fosetyl-A1 80 WDG	Disease	22 lbs.	0	0
	Glyphosate 4 Plus	Weeds	1,564 oz.	0	0
	Power Zone	Weeds	57 oz.	0	0
	Revolver	Weeds	432 oz.	0	0
	Round Up Custom	Weeds	1,104 oz.	0	0
	Sedge Hammer	Weeds	18 gal	0	0
	Speed Zone	Weeds	17 oz.	0	0
	Stone Wall 65 WDG	Weeds	12 lbs.	0	0
	SurflanXL 2G	Weeds	400 lbs.	0	0
OC Great Park	Glyphosate 4 Plus	Weeds	1,438 oz.	0	0
	Orazylin 4	Weeds	128 oz.	0	0
	Power Zone	Weeds	331 oz.	0	0
	Speed Zone	Weeds	137 oz.	0	0
	Turf Wash	Bacteria	6 oz.	0	0
	Phycomycin*	Algae	16,400 oz.	12,000 oz.	13,200 oz.
	Finalsan*	Weeds	0	0	1,616 oz.
	Suppress EC*	Weeds	0	0	1,048 oz.

**Phycomycin, an organic product for control of algae in the ponds and basins. Finalsan and Suppress EC are organic weed killer products.*

TABLE 3 CITY OF IRVINE PESTICIDE USAGE SUMMARY CITYWIDE – RODENTS				
PRODUCT	**PEST**	**TOTAL USE IN 2015**	**TOTAL USE IN 2016**	**TOTAL USE IN 2017**
SYNTHETIC PESTICIDES				
Fumitoxin Tablets	Rodent	1.09 lb.	0	0
Diphacinone	Rodent	69.0 lb.	0	0
Rozol Vole	Rodent	2 lb.	0	0
Maki Mini	Rodent	6.0 lb.	0	0
Avalon Strchnine	Rodent	1.44 lb.	0	0
Omega Gopher Grain	Rodent	30 lb.	0	0
Contract Bait Block	Rodent	28 oz.	52 oz.	0
ORGANIC PESTICIDES				
Rat X	Rodent	1.25 lb.	60 lb.	126.34 lb.
Uncle Ian's Gopher Repellant	Rodent	1.0 lb.	212 lb.	997.93 lb.

TABLE 4 CITY OF IRVINE PESTICIDE USAGE SUMMARY CITYWIDE – INSECTS				
PRODUCT	**PEST**	**TOTAL USE IN 2015**	**TOTAL USE IN 2016**	**TOTAL USE IN 2017**
SYNTHETIC PESTICIDES				
Temprid	Insects	8 ml	0	0
Transport GHP	Insects	74.9 oz.	0	0
PT Wasp Freeze	Insects	8 oz.	0	0
P.I. Contact	Insects	156 oz.	0	0
Demand CS	Insects	24.5 oz.	0	0
Tengard	Insects	12.2 oz.	0	0
Tempo SC Ultra	Insects	7.5 oz.	0	0
UP Star Gold	Insects	6 oz.	0	0
Talstar	Insects	71.7 oz.	208 oz.	0
Masterline Bifenthrin	Insects	95.93 oz.	6.49 oz.	0
ORGANIC PESTICIDES				
Essentria IC3	Insects	0	13,516 oz.	22,696.41 oz.
Eco EXEMPT Jet	Insects	0	1,625 oz.	591 oz.

EcoVia	Insects	0	43 oz.	121.60 oz.
WHY Spray	Insects	0	0	2,268 oz.

TABLE 5
CITY OF IRVINE PESTICIDE USAGE SUMMARY
RIGHT-OF-WAYS

PRODUCT	PEST	TOTAL USE IN 2015	TOTAL USE IN 2016	TOTAL USE IN 2017
SYNTHETIC PESTICIDES				
Round Up	Weeds	8,139 oz.	0	0
Arrow 2EC	Bermuda grass	115 oz.	0	0
Speed Zone	Turf Weeds	227.9 oz.	0	0
Power Zone	Turf Weeds	14,848 oz.	0	0
Turflon Ester	Turf Weeds	56 oz.	0	0
Sedge Hammer	Nutsedge	432 oz.	0	0
Gallery 75	Pre-emergent	16 oz.	0	0
Orazylin 4	Pre-emergent	89 oz.	0	0
ORGANIC PESTICIDES				
Avenger	Weeds	0	20,672 oz.	512 oz.
Scythe	Weeds	0	9,538 oz.	10,748 oz.
Suppress EC	Weeds	0	17,316 oz.	223,484 oz.
Finalsan	Weeds	0	0	1,700 oz.
Weed Pharm	Weeds	0	0	327,879 oz.
Fiesta	Weeds	0	0	1,812 oz.
PreEmerge	Weeds	0	0	768 oz.

TABLE 6

PRODUCT	COST PER GALLON	DILUTION RATE	100 GALLONS OF SOLUTION	TOTAL COST
ORGANIC PESTICIDES				
Weed Pharm	$12.00	N/A	100 gal	$1200.00
Scythe	$95.00	7%	7 gal	$ 665.00
Suppress EC	$70.00	9%	9 gal	$ 630.00

Appendix 2

Contractor daily application logs and reports for 2017