City of Santa Barbara
Integrated Pest Management Strategy

2008 Annual Report

Draft March 2009

P.O. Box 1990
Santa Barbara, California, 93102
(805) 564-5434
www.santabarbaraca.gov
http://www.santabarbaraca.gov/Resident/Community/Parks_and_Beaches/Integrated_Pest_Management.htm

TABLE OF CONTENTS

I. INTRODUCTION

In January 2004, the City of Santa Barbara (City) adopted a jurisdiction–wide Integrated Pest Management (IPM) Strategy. The City's IPM Strategy was developed to help reduce pesticide hazards on City property and promote effective pest management. The 2008 IPM Annual Report is the fifth Annual Report for the program.

The IPM Strategy requires an Annual Report that addresses each of the following areas:

- Types of pest problems each Department encountered
- Types and quantities of pesticides used by each Department
- Exemptions currently in place and granted during the previous year
- Alternatives currently used for phased out pesticides
- Alternatives proposed for adoption within the next 12 months
- Effectiveness of changes to pest management
- Planned changes to pest management practices

Integration of the PHAER Zone System

The IPM Strategy required the development of a "Zone System" tied to the IPM Approved Materials List to limit pesticide use based on potential human exposure. In February 2006, the City Council adopted the PHAER system for incorporation into the IPM Strategy.

The PHAER system assigns Green, Yellow, or a Special Circumstance/Red Zone designation to sites, or portions of sites, based upon the potential for exposure by humans and sensitive habitat to hazardous pesticides, and allows use of carefully screened materials by zone designation. For example, Green Zones are areas of high exposure potential, and only pesticides designated as "Green", which show very limited human and environmental impacts, may be used. Yellow Zones are areas with less potential for harm from exposure, and a broader range of "Yellow" materials are permitted under the PHAER Zone system.

As a management tool, the Parks and Recreation Department has been operating a dedicated crew to provide some of the labor necessary in pursuing the specific alternative practices and goals included in the PHAER Zone.

In addition to the areas described above, the 2008 Annual Report discusses the Pesticide Hazard And Exposure Reduction (PHAER) Zone System.

Citizen and Staff IPM Advisory Committees

The Staff IPM Committee continued to work effectively with the Citizen IPM Advisory Committee to administer the IPM Strategy, and oversee pest management practices. In 2008 the Citizen IPM Advisory Committee met five times to discuss and act on IPM policies and practices and made a site visit to Alice Keck Park Memorial Gardens to inspect the weed issues in the park.

The 2008 Citizen IPM Advisory Committee included the following representatives:

- Eric Cardenas, Environmental Defense Center (EDC)
- Greg Chittick, community at large
- Oscar Carmona, community at large
- Kristen LaBonte, community at large
- Corey Wells, Pesticide Awareness and Alternative Coalition (PAAC)

Eric Cardenas finished his term at the end of 2008. A new committee member will be selected to represent the EDC in 2009.

Department IPM Coordinators are appointed by Department Heads to serve on the Staff IPM Committee.

Department representatives include:

- Jeff McKee, Airport Department
- Michele DeCant, Community Development Department
- Joe Poire, Fire Department
- James Dewey, Public Works Department
- Judd Conley, Waterfront Department
- Santos Escobar, serving as the IPM Coordinator, Parks and Recreation Department

IPM Advisory Committee Dissentions

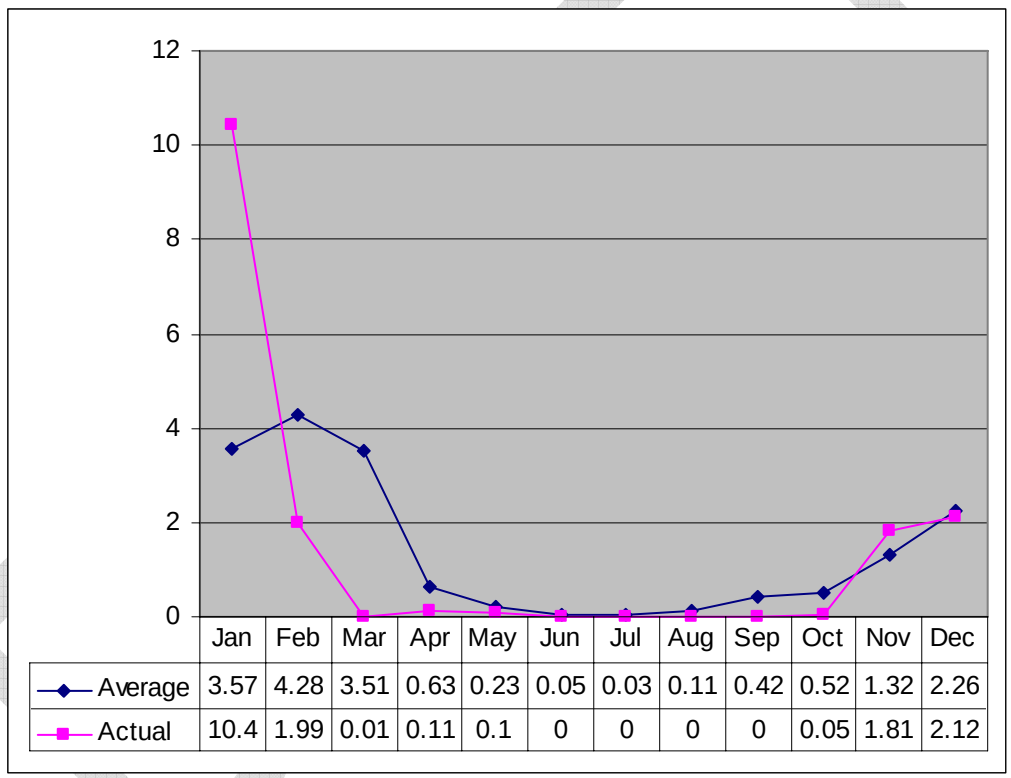
In 2008, there were no IPM Advisory Committee dissentions. A dissention is when a vote is not unanimous.

II. 2008 PROGRAM SUMMARY

In the fifth year of the IPM program, overall the City decreased pesticide use 31% from 1,646 units in 2007 to 1,132 units 2008. This includes a decrease in the use of Red materials from 32 units to 25 units. The use of Yellow materials decreased from 1,571 units to 868 units. The use of Green materials increased from 43 units to 239 units. The IPM Strategy favors the use of Green materials and an increased use of Bacillus for mosquito control at the Airport caused a significant rise in the use of Green materials this year. The graph below shows the high rainfall experienced in January, as well as the relatively dry remainder of the year. The abnormally wet January required increased mosquito treatment at various sites.

One of the main factors that determine pest populations is rainfall. The more rain the area receives in a year, the greater the population of insects and weeds.

2008 Rainfall Chart



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average	3.57	4.28	3.51	0.63	0.23	0.05	0.03	0.11	0.42	0.52	1.32	2.26
Actual	10.4	1.99	0.01	0.11	0.1	0	0	0	0	0.05	1.81	2.12

It is important to note that because pesticide use will vary from year to year, an increase or decrease from the previous year does not necessarily indicate a long-term trend. Many factors affect the amount of pesticides applied in any one year.

City-Wide

- The units of pesticides applied decreased from 1,646 to 1,132.
- Units of Green materials increased from 43 to 239.
- Units of Yellow materials decreased from 1,571 to 868.
- Units of Red materials decreased from 32 to 25.
- The number of times pesticides were applied (including Green, Yellow, and Red materials) decreased from 269 in 2007 to 160 in 2008.
- City-wide, fourteen infractions of the IPM Strategy were recorded.

Airport Department

- Due to an over-all average rain season in 2008, applications of Altosid XR, an extended release, yellow mosquito control product, decreased by from 1,153 units in 2007 to 621 units in 2008. A pilot project using a larger percentage of green materials to control mosquitoes was initiated in the fall of 2008.
- Applications of Ditrac, a Yellow material, for rodent control were dramatically reduced from 197 units in 2007 to 33 units in 2008.
- 15,834 labor hours were spent performing alternative efforts for weed control, etc.
- Applications of the yellow materials Roundup Pro and Surflan used to control weeds decreased from 140 units in 2007 to 137 units in 2008.
- An exemption for Termidor SC was granted for the treatment of an infestation of subterranean termites in one Airport building.
- The Airport had one infraction of the IPM Strategy. Contractors working for the Airport inadvertently applied .75 gallons of QuickPro herbicide, a Red material, in an Airport Yellow zone without an exemption. This was the only application of a special circumstance material at the Airport in 2008.

Creeks Division, Parks and Recreation Department

- No pesticides were applied in 2008.
- Application of 102 yards of mulch.

Golf Division, Parks and Recreation Department

- The units of pesticides applied increased from 12 to 29.
- Units of Yellow materials decreased from 11 to 5.
- Units of Red materials increased significantly from 1 to 24.
- The golf course continues to brew microorganisms and compost tea for the greens.
- Golf had two infractions of the IPM Strategy, applying an herbicide and a fungicide without the required exemption.

Parks Division, Parks and Recreation Department

- The units of pesticides applied increased from 17 to 78.
- Units of Green materials increased from 12 to 40.
- Units of Yellow materials increased from 6 to 38.
- No Red materials were used in 2008.
- 3,587 lineal feet of curbing installed in parks to reduce weed spread.
- Application of 2,125 yards of mulch.

Public Works Department

- The units of pesticides applied increased from 2 to 28.
- Units of Green materials increased from .5 to 20.
- Units of Yellow materials increased from 1 to 8.
- Units of Red materials increased from 0 in 2007 to .221 in 2008.
- Public Works had eleven infractions of the IPM strategy. Eleven pesticides were applied without the required exemptions. These applications totaled 8 units and most were due to contractor use for structural pest control, and many were applied in bait stations.

Waterfront Department

- No pesticides were applied in 2008.

III. PEST PROBLEMS ENCOUNTERED

The table below outlines the variety of pests encountered on City properties in 2008. Departments ranked their top three pest problems with numbers 1, 2 and 3. Other pest problems encountered are checked (✓). Footnote annotations provide additional information.

Pest Problems Encountered Table

		Airport	Creeks	Golf	Parks	Parking	Public Works	Waterfront
Plant pests	Giant whitefly			✓	✓	✓	✓	
	Misc. plant insects			✓	✓[3]	**3**		
	Disease			**1**[1]	✓[4]	✓		
Specimen Tree Pests	Oak Worm	✓		✓	✓	**2**		
	Psyllids			✓	✓			
Weeds	Invasives	✓	✓	**3**[2]	**1**[5]			
	General weeds	**3**	✓	✓	**1**	**1**	✓	**3**
	Perennial grasses	✓	✓	✓	**1**[6]		✓	✓
Vertebrates	Gopher	**2**	✓	**2**	**2**		✓	✓
	Ground Squirrel	✓	✓	**2**	✓			✓
	Gulls/ nuisance birds	✓		**2**	✓	✓		**2**
	Moles			**2**	✓			
	Raccoons			**2**				
	Skunks			**2**				
Human Health	Poison Oak	✓			✓			
	Bees, yellow jackets, etc.			✓	**3**	✓	**2**	
	Rats/ mice	✓		✓	✓	✓	**3**	**1**
	Mosquitoes	**1**			✓		**1**	
Other	Termites	✓					✓	
	Roaches						✓	
	Pigeons	✓				✓	✓	
	Crows	✓		✓				
	Ants	✓				✓		

1. Golf reported these plant diseases (fungus): Dollar Spot, Pink Snow Mold, Anthracnose, and Yellow Patch.
2. Golf reported the invasive weed: Clover.
3. Parks reported these plant insects: Lerp Psyllids, Mites, Oak Moths, Thrips, Aphids, Snails, Slugs, and Ants.
4. Parks reported these plant diseases: Leaf Spot, Mildew, Blight, Pink Bud Rot, Sooty Mold, Pythium, Armillaria, and Phytothora.
5. Parks reported these invasive weeds: Arundo, Nutgrass, Kikuyu Grass, Clover, Oxalis, Malva, Foxtail, Spurge, Dandelion, Milkweed, Sow Thistle, Poa annua, Puncture Vine, Johnson Grass, and Poison Oak.
6. Parks reported the following perennial grasses: Crab and Bermuda.

This page intentionally left blank

IV. TOTAL PESTICIDE USE

Data has been collected for City-wide pesticide application since 2004. However, data is available for the Golf Division for the last 7 years and for the Parks Division for the last 10 years. This data is plotted in the graphs on subsequent pages which depict the various reductions and increases in pesticide use by each Department. A City-wide narrative is provided as well as one for each Department describing the particular pest issues faced this year, followed by a graph depicting pesticide use.

There are a number of factors that affect pesticide use. Theses include weather patterns (unseasonably dry or wet weather), introduction of new, or changes to existing pest populations, and changes in the effectiveness or availability of pesticide materials.

It should also be noted that due to the change in 2006 from the Tier system to the PHAER system of pesticide classification, the graphs will show an expanded data list beneath each chart. The top data list is based on the PHAER system of pesticide classification and is valid for the 2006 - 2008 columns only. The lower data list is based on the Tier system and is included for prior years to provide historical data.

As the program continues into its sixth year, reduced budgets and staffing levels will be a significant challenge. Financial constraints may require a change in service levels and aesthetic expectations or a greater reliance on more cost effective traditional pesticides. However, the IPM Strategy favors the use of Green materials when practical and cost-effective. In the instances where a viable Green alternative exists, is likely that the overall volume of materials applied will increase. Green materials require higher application levels than high risk pesticides. A rise in Green material use, though it increases the over-all pesticide use in the City, will generally mean a reduction in the application of higher risk Yellow and Red materials.

Overall City-wide Pesticide Use

City-wide pesticide use decreased in 2008, mainly because of reduced use of Yellow materials for mosquito control at the Airport. Pesticides applied decreased from 1,646 units in 2007 to 1,131.989 units in 2008. The use of Green materials increased from 43 units to 239 units. The use of Yellow materials decreased from 1,562.03 units to 867.59 units and Red materials decreased from 32 units to 25.392 units.

The table below provides a summary of the pesticides applied on City property in 2008. Pesticides are reported in either pounds or gallons depending on if they are dry or liquid. The column labeled "Type" includes the type of pesticide applied: Insecticide, Fungicide, Herbicide, Molluscicide, and Rodenticide. The data used to generate the total overall pesticide use is based upon total units (gallons or pounds) of all materials.

City Departments who applied pesticides, or contracted with pesticide applicators, prepared monthly pesticide and alternative use reports, and participated in the preparation of this Annual Report. The monthly reports form the basis of the Annual Report and are available at the main offices of each Department.

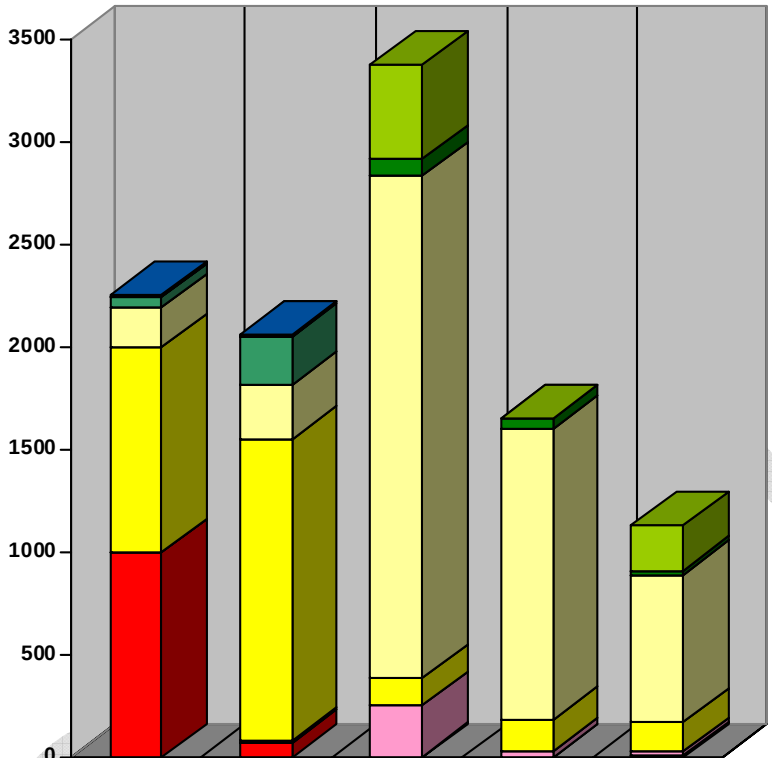
Total Pesticide Use Table

	Pesticide Name	Active Ingredient	Type	Amount of Pesticide Applied								Applications			
				Airport		Golf		Parks and Recreation		Public Works		Airport	Golf	Parks and Recreation	Public Works
				Gallons	Pounds	Gallons	Pounds	Gallons	Pounds	Gallons	Pounds				
	Burnout II	Clove Oil	Herbicide	19											
	Summit Bits	Bti	Insecticide						40		20			1	1
	Vectobac G	Bti	Insecticide		5							1			
	Vectolex CG	Bacillus sphaericus	Insecticide		155							3			
	not reported	Permethrin	Insecticide							0.01					
	Green Totals			19	160	0	0	0	40	0.01	20	4	0	1	1
	Altosid XR	Methoprene	Insecticide		620.50						0.007	9			1
	Ditrac	Diphacinone	Rodenticide		33.125							12			
*	Maxforce	Hydramethylnon	Insecticide							0.003					1
	M-Pede	Potassium fatty acids	Insecticide							2					4
	Neem Oil	Neem Oil	Fungicide					0.04						1	
	Omni Oil	Petroleum	Insecticide							1		8			4
	Round-up Pro	Glyphosate	Herbicide	76.875		4.97		4.2				14	30	24	
	Surflan	Oryzalin	Herbicide	60								4			
	Termidor SC	Fipronil	Insecticide	0.98						0.27		1			5
*	Terro	Sodium Tetraborate	Insecticide							0.12					5
	Wilco Rodent Bait	Diphacinone	Rodenticide						34		4.5			1	4
	XL2G	Oryzalin / Benefin	Herbicide		25							1			
	Yellow Totals			137.855	678.625	4.97	0	4.24	34	3.393	4.507	49	30	26	24
	Banner-maxx	Propiconazole	Fungicide			0.78							1		
	Daconil	Chlorothalonil	Fungicide			7.5							2		
	Fungicide X	Iprodione	Fungicide			0.08							1		
	Fusilade	Fluazifop-P-butyl	Herbicide			0.001							1		
	Heritage	Azoxystrobin	Fungicide				2.5						1		
	Medallion	Fludioxonil	Fungicide				13.56						5		
	QuickPro	Glyphosate / Diquat	Herbicide	0.75								2			
*	not reported	Acetamiprid	Insecticide							0.08					1
*	not reported	Bromadiolone	Insecticide								0.001				1
*	not reported	Indoxacarb	Insecticide								0.09				5
*	not reported	Chlorfenapyr	Insecticide								0.05				5
	Red Totals			0.75	0	8.361	16.06	0	0	0.08	0.141	2	11	0	12
Department Totals				**157.605**	**838.625**	**13.331**	**16.06**	**4.24**	**74**	**3.483**	**24.648**	**55**	**41**	**27**	**37**

City-wide Totals	**Gallons**	**178.659**	**Pounds**	**953.333**	**Applications**	**160**

* These products are applied in bait stations and so may pose less risk than the category in which they're placed.

City-wide Pesticide Use



	2004	2005	2006	2007	2008
PHAER					
Green Pounds			489.05	.5	220
Green Gallons			48.5	42.96	19.01
Yellow Pounds			2449.91	1,421.95	717.132
Yellow Gallons			135.65	149.08	150.458
Red Pounds			246.93	30.56	16.201
Red Gallons			3.75	1.25	9.191
History					
Tier 4 Gallons					
Tier 4 Pound	9	3.4			
Tier 3 Gallons	1.1	1.25			
Tier 3 Pounds	54	236.54			
Tier 2 Gallons	195.5	267.04			
Tier 2 Pounds	992	1469.03			
Tier 1 Gallons	5.5	9			

Parks Division Pesticide Use

The Parks Division had an increase in materials used throughout 2008. There was an increase in the use of Green materials from 11.7 units to 40 units due to the application of Bti to the André Clarke Bird Refuge to manage mosquito populations from an unusually wet January. There was an increase in Yellow materials from 5.71 units to 38.24 units due primarily to an exemption that Parks received to apply Diphacinone at Shoreline Park to control the squirrel population. No Red materials were used in 2008 in any park.

Exemptions

The Parks Division applied for and received three exemptions. The first exemption was for the use of Glyphosate at Parma Park to eradicate the non-native Onion Weed. This exemption was not used. The second exemption was for the use of Glyphosate to treat invasive Arundo at Shoreline Park. This exemption was used successfully. The third was an exemption for the use of Diphacinone for the control of squirrels at Shoreline Park. This exemption was used successfully.

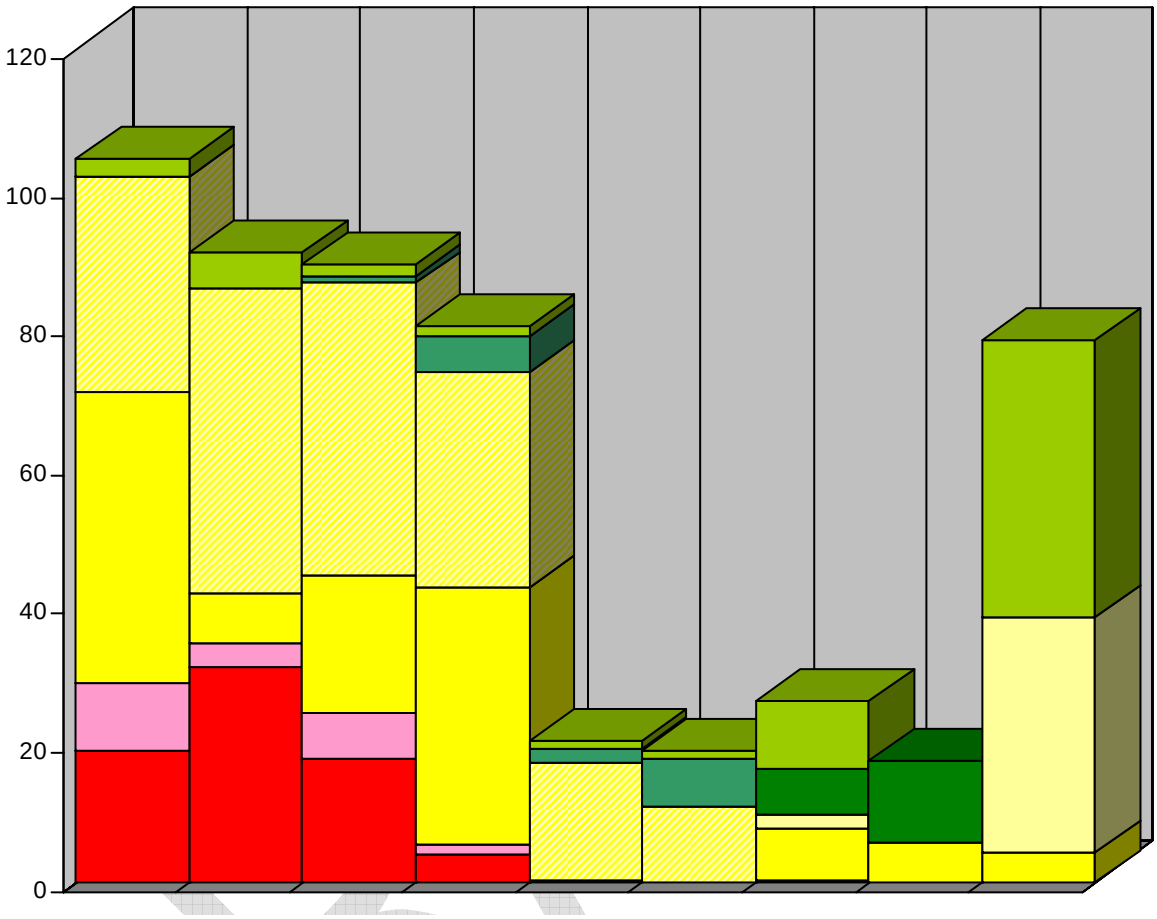
Alternatives Used

The Parks Division used several products and processes as alternatives for insecticides. Worm castings were applied at Alice Keck Park Memorial Gardens and other sites to control White Fly. Worm castings were also applied at the A.C. Postel memorial Rose Garden to control various insects. Omni Oil was also applied to the Rose Garden as a dormant spray. These products have proven effective as alternatives to higher risk insecticides.

The unusually high rainfall in January produced a significant spring weed crop. The Parks Division performed 4,130 hours of alternative weed management. The Parks Division used a weed flamer on sidewalk cracks and rocky areas as well as a steam weeder around trees and the application of mulch and weed fabrics in planter areas. However, as in years past, the majority of work went into hand weeding and mechanical weeding with power equipment.

Various other alternatives were practiced in 2008, including trapping for rodents and the continued installation of concrete curbing in planter areas to prevent weed encroachment. A contractor was used 8 times to manage bee hives or yellow jacket nests by relocation or eradication using Green materials. The Parks Division also continues to experiment with alternative herbicides in hopes of finding effective products.

Parks Division Pesticide Use



	2000	2001	2002	2003	2004	2005	2006	2007	2008
PHAER									
Green Pounds							10		40
Green Gallons							6.5	11.71	
Yellow Pounds							2		34
Yellow Gallons							7.43	5.71	4.24
Red Pounds									
Red Gallons							0.25		
History									
Tier 4 Gallons									
Tier 4 Pound									
Tier 3 Gallons	2.5	5.3	1.75	1.5	1	1.25			
Tier 3 Pounds			1	5.05	2	7			
Tier 2 Gallons	31	44	42	31	17	10.71			
Tier 2 Pounds	42	7	20	37					
Tier 1 Gallons	9.8	3.6	6.7	1.7	0.22				
Tier 1 Pounds	18.9	30.91	17.6	3.8					
Totals	**104.2**	**90.81**	**89.05**	**80.05**	**20.22**	**18.96**	**26.18**	**17.42**	**78.24**

Golf Division Pesticide Use

Due to a wet January and a warm, humid summer, management of the golf course required an increase in fungicide (Red) and herbicide (Yellow) use. Periods of hot, humid weather are ideal for an increase in fungal activity. Although the Golf Division is diligent with implementing alternative methods to control these pathogens, there will be times when the only control will come from the use of fungicides. Weed populations also increased due to a wet January. These conditions prompted an increased use of Roundup when compared to a drier season in 2007. The Golf Division had an overall increase in material use from 12 units in 2007 to 29 units in 2008. There was a decrease in Yellow materials from 10.94 units to 4.97 units and an increase of Red materials from 1 unit to 24 units.

Alternatives Used

The Golf Division continues to brew effective microorganisms and compost tea for the greens. In addition to these alternatives, the Golf Division also applies seaweed that is rich in anti-oxidants. These measures will continue to make pesticide inputs more manageable over time.

The Golf Division increased the use of Biosolids. Biosolids are used as an organic fertilizer and topdressing in place of inorganic varieties of fertilizer.

The Golf Division has also reduced its use of fertilizer on the greens. Excessive use of fertilizer leads to excessive growth and a succulent turf more vulnerable to fungal diseases. The Golf Division switched to Ferrous Sulfate and Manganese Sulfate. These materials control growth and provide an acceptable green color. Higher rates of Sulfate in plant tissue also work as a natural fungicide.

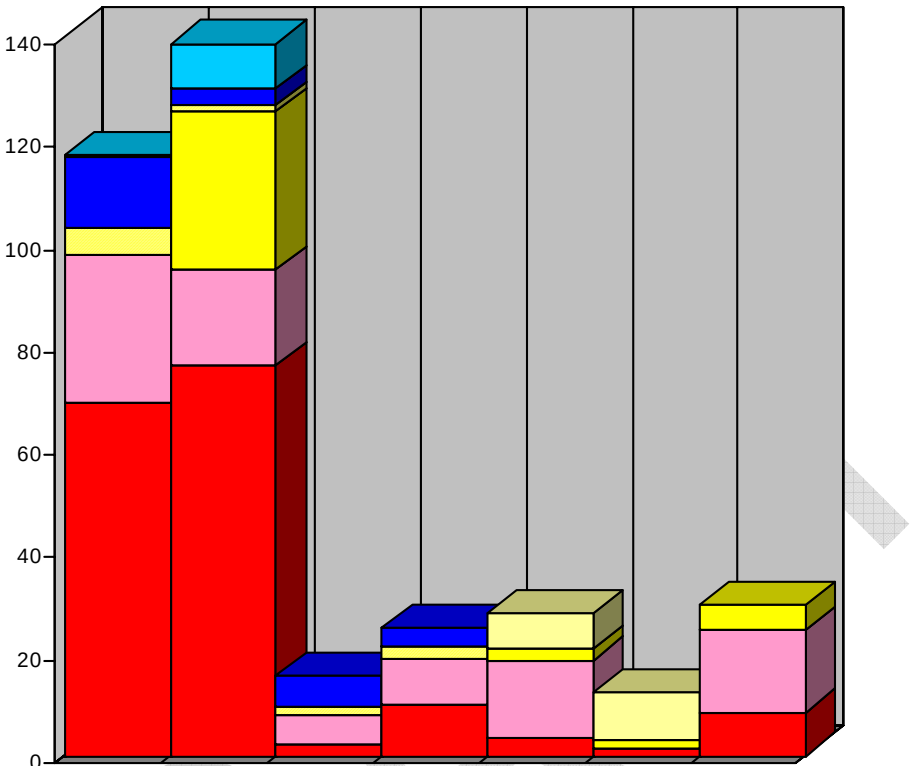
In all, the Golf Division used 315 cubic yards of Biosolids, 1200 gallons of composted tea brew, 215 gallons of effective microorganisms and 16 gallons of seaweed.

Infractions

An Infraction is the application of a restricted material without an exemption. An exemption is required to use materials that are not on the Approved Materials List (see attachment A) or to use higher risk materials in areas designated as lower risk (using a Red material in a Yellow area or a Yellow material in a Green area.)

The Golf Division made an application of Iprodione, a Red fungicide. This material is not on the Approved Materials List. The Golf Course Manager was faced with diseases affecting three greens and spot-treated the turf with the material. A small amount of Fusilade, a Red herbicide was applied to control Bermuda Grass on the nursery green. These applications were done without an exemption or an emergency exemption. To ensure this never happens again, staff has been retrained on the IPM strategy.

Golf Division Pesticide Use



	2002	2003	2004	2005	2006	2007	2008
PHAER							
Green Pounds							
Green Gallons							
Yellow Pounds					7	9	
Yellow Gallons					2.31	1.94	4.97
Red Pounds					15		16.06
Red Gallons					3.5	1.25	8.361
History							
Tier 4 Gallons	0.04	8.75					
Tier 4 Pound	13.7	3.13	6	3.4			
Tier 3 Gallons							
Tier 3 Pounds							
Tier 2 Gallons	5.1	1.4	1.9	2.5			
Tier 2 Pounds	0.19	30.84					
Tier 1 Gallons	28.9	18.7	5.3	9			
Tier 1 Pounds	68.8	76	2.45	10			
Totals	**116.73**	**138.82**	**15.65**	**24.9**	**27.81**	**12.19**	**29.391**

Airport Department Pesticide Use

The Airport Department pesticide applications are concentrated on three types of pests: mosquitoes, rodents and weeds. The overwhelming majority of pesticides are applied to control mosquitoes. The weather cycle directly impacts production of mosquitoes and weeds.

Mosquitoes

Despite high rainfall in January, dry conditions for the rest of the year limited the need for a second application of Extended Release Altosid XR. A pilot project was initiated in the fall of 2008 to assess the effectiveness of controlling mosquitoes by reducing pretreatment with Altosid XR in favor of later applications of green products. The result was a significant reduction in the use of Yellow materials for mosquito control.

Weeds

Use of Roundup decreased from 89 units to 77 units, while use of Surflan increased from 51 units to 60 units. After several years of implementing the IPM program, the Airport Department is seeing an increase in weeds that are resistant to the limited palate of herbicides. Higher concentrations of herbicides were needed to adequately control weeds on the airfield. Some hand weed abatement was conducted on the airfield, however, this effort is limited due to safety considerations for maintenance personnel. The Department also applied XL2G, a Yellow herbicide, to control weeds on the traffic islands on Hollister Ave.

Rodents

In 2008 the Airport Department implemented a plan to reduce the amount of Ditrac used for rodent control. As a result, the Department used significantly less Ditrac, from 197 units in 2007 to 33 units in 2008. The Airport Department requested and received an exemption for Fumitoxin in 2008, however no applications were made due to dry conditions.

Termites

In 2008 the Airport Department received exemptions for two chemicals to treat termites. Applications of Termidor SC were made to eradicate subterranean termites in one Airport building. Treatment of drywood termites in other Airport buildings has been deferred until 2009.

Alternatives Used

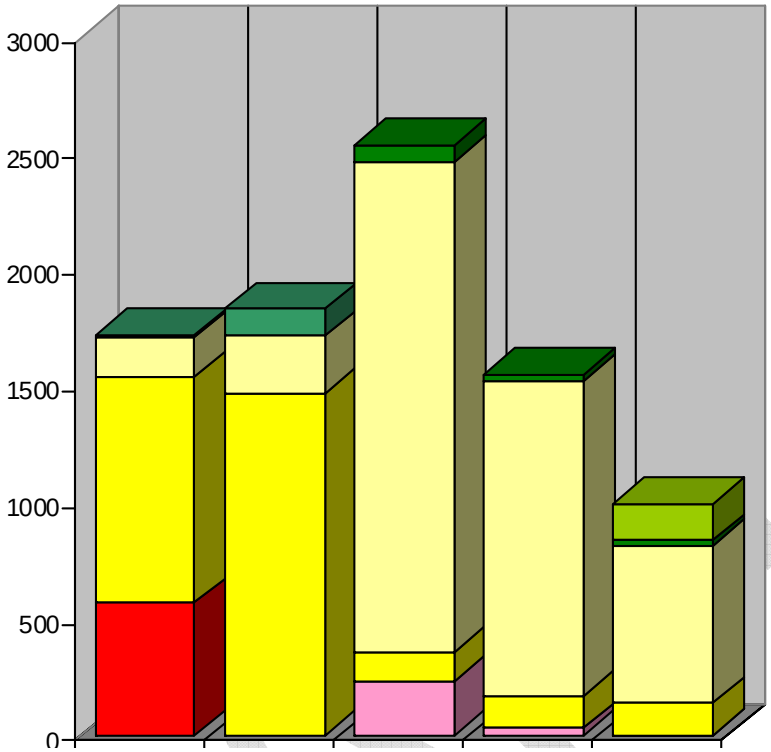
Alternative efforts focused on the control of weeds through mechanical methods, including string trimming, hand weeding and hoeing. The number of hours devoted to these methods remained high in 2008 at 15,834 hours. The Airport Department also applied 19 gallons of Burnout II, a Green herbicide, to control weeds, but obtained no long-term control.

Infractions

An Infraction is the application of a restricted material without an exemption. An exemption is required to use materials that are not on the Approved Materials List (see attachment A) or to use higher risk materials in areas designated as lower risk (using a Red material in a Yellow area or a Yellow material in a Green area.)

Contractors working for the Airport Department inadvertently applied .75 gallons of Round-up QuickPro Herbicide, a Red material that contains both Round-up and diquat to a traffic island Yellow zone without an exemption. In response to the error, the Airport Department now requires the contractor to request and receive written approval prior to any application of herbicides. The IPM Advisory Committee was briefed at its regularly scheduled meeting following the incident.

Airport Pesticide Use



	2004	2005	2006	2007	2008
PHAER					
Green Pounds			28.5		160
Green Gallons			42	31.25	19
Yellow Pounds			2107.31	1,349.95	678.625
Yellow Gallons			125.61	140.05	137.855
Red Pounds			231.93	30.06	
Red Gallons					0.75
History					
Tier 4 Gallons					
Tier 4 Pound					
Tier 3 Gallons					
Tier 3 Pounds	12.5	115.4			
Tier 2 Gallons	170.9	247.2			
Tier 2 Pounds	972.3	1469			
Tier 1 Gallons					
Tier 1 Pounds	568				
Totals	**1723.7**	**1831.6**	**2535.35**	**1551.31**	**995.48**

Public Works Department Pesticide Use

The Public Works Department increased in pesticide use in 2008 in each category. Green materials increased from .5 units in 2007 to 20.01 units in 2008 primarily due to high January rainfall levels and the resulting use of the Green material Bti to treat for mosquitoes. Use of Yellow material increased from 1.38 units in 2007 to 7.9 units in 2008 primarily from an increased use of rodent baits. Red material usage increased from zero units to .221 units. The increase of Red materials is entirely due to contractor use of bait stations for structural pest control.

Alternatives Used

The Parking Division continues to use alternative methods for weed control including hand weeding, weed whipping, and limited use of weed burning. A total of 225 hours were devoted to non chemical methods of weed control in 2008. Alternative practices for pest management included plant replacement, worm castings, and washing off insects with water pressure.

The Environmental Services Program employed a contractor who caught 1,203 rodents in traps along State Street and Coast Village Road. A contractor also relocated 12 bee hives or swarms.

The Streets Division managed squirrel populations at the Laguna channel that were causing bank instability by filling their runs with concrete slurry.

The Building Maintenance Division employed contractors to relocate bee hives and control rodents with mechanical traps.

Infractions

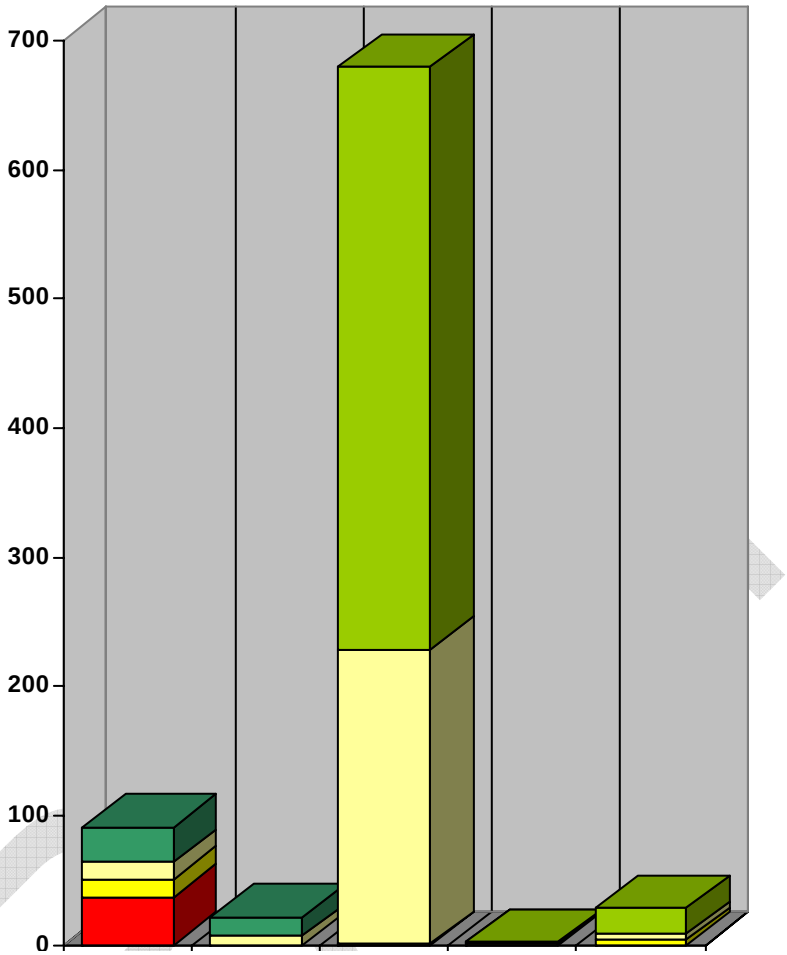
An Infraction is the application of a restricted material without an exemption. An exemption is required to use materials that are not on the Approved Materials List (see attachment A) or to use higher risk materials in areas designated as lower risk (using a Red material in a Yellow area or a Yellow material in a Green area.)

The Public Works Department applied eleven materials without exemptions.

A contractor working for the Downtown Parking Division applied M-pede and Omni Oil for the control of Oak Worm in Lots 2, 11, 12 and the Cota Commuter Lot. These products are Yellow and were applied without the required exemption.

The Building Maintenance Division appled Altosid, Terro, Termidor, Maxforce, Diphacinone, Acetamiprid, Bromadiolone, Indoxacarb and Chlorofenapyr without the required exemptions. Contractors working for Public Works applied these five Yellow and four Red materials in City buildings. These materials were used for structural pest control, and many were applied in bait stations. Leadership transitions resulted in reduced oversight of these contractors during the year. These contractor management errors have been corrected with the new staff.

Public Works Pesticide Use



.	2004	2005	2006	2007	2008
PHAER					
Green Pounds				0.5	20
Green Gallons			450.55		0.01
Yellow Pounds					4.507
Yellow Gallons			228.6	1.38	3.393
Red Pounds			0.31		0.141
Red Gallons					0.08
History					
Tier 4 Gallons					
Tier 4 Pound					
Tier 3 Gallons					
Tier 3 Pounds	27	15.16			
Tier 2 Gallons	13	6.625			
Tier 2 Pounds	14	0.031			
Tier 1 Gallons					
Tier 1 Pounds	37				
Totals	**91**	**21.816**	**679.46**	**1.88**	**28.131**

V. EXEMPTIONS

Under the IPM Strategy and PHAER Zone system, exemptions may be granted when a pest outbreak poses an immediate threat to public health or will result in significant economic or environmental damage from failure to use a pesticide on the *Phased-Out Pesticide List* or in a designated zone that would otherwise prohibit it. Exemptions may be requested for one time application or as a programmatic exemption for a single year. The exemption process is outlined in the IPM Strategy.

- 16 exemptions were requested in 2008 as summarized in the table to the right and as listed in the table below.
- No emergency exemptions were requested in 2008.
- All 16 requests were for planned action and 15 were granted by the IPM Citizens Advisory Committee.
- Of the 15 requests approved, 8 were not applied.

Exemption Summary Table

2007 Exemptions	Airport	Creeks	Golf	Parks	Waterfront	County	Totals
Emergency							
Proposed	3	1	7	3	1	1	16
Passed	3	1	7	3		1	15
Denied					1		1
Applied	1		4	3			8
Not Applied	2	1	3		1	1	8

Exemption Detail Table

Vote	Dept. / Div.	Material	Type	Type	Pest	Exemption Type	Used	Site
Passed	Airport	Fumitoxin	Rodenticide		Rodents	Programatic	No	Airfield
Passed	Airport	Fipronil	Insecticide		Termites	Programatic	Yes	Rental structures
Passed	Airport	Vikane	Insecticide		Termites	Programatic	No	Rental structures
Passed	County	Glyphosate	Herbicide		Weeds	Programatic	No	Hidden Valley Park
Passed	Creeks	Glyphosate	Herbicide		Weeds	Programatic	No	Creek sites
Passed	Golf	Banner-maxx	Fungicide		Fungus	Programatic	Yes	Greens
Passed	Golf	Conserve	Fungicide		Fungus	Programatic	No	Greens
Passed	Golf	Daconil	Fungicide		Fungus	Programatic	Yes	Greens
Passed	Golf	Heritage	Fungicide		Fungus	Programatic	Yes	Greens
Passed	Golf	Medallion	Fungicide		Fungus	Programatic	Yes	Greens
Passed	Golf	Merit	Fungicide		Fungus	Programatic	No	Greens
Passed	Golf	Prostar	Fungicide		Fungus	Programatic	No	Greens
Passed	Parks	Ditrac	Rodenticide		Rodents	Programatic	Yes	Shoreline Park
Passed	Parks	Glyphosate	Herbicide		Weeds	Programatic	No	Parma Park
Passed	Parks	Glyphosate	Herbicide		Weeds	Programatic	Yes	Shoreline Park
Declined	Waterfront	Ditrac	Rodenticide		Rodents	Programatic	No	Wharf and marinas

Comparison of Exemptions for 2007 and 2008

	2007	2008
Number of Exemption Requests	13	16
Number of Exemption Requests Approved	13	15
Number of Approved Exemption Requests Applied	5	8

VI. ALTERNATIVE PEST MANAGEMENT PRACTICES USED IN 2008

Non-chemical pest management alternatives used in 2008 are reviewed in the table below. The use of non-chemical IPM alternatives continues to be emphasized over pesticide applications. Hours reported for the total year are from the *Monthly Alternative Use Reports* prepared by each Department. A check (✓) indicates the alternative was used but time was not tracked. The total tracked hours for City-wide alternative practices declined from 27,241 in 2007 to 23,569 in 2008.

PEST	Alternative	Airport	Golf	Public Works	Parks	Citywide Hours
WEEDS	Mulch & wood chips	✓	40	✓	680	**720**
	Weed fabric				48	**48**
	Propane flame weeder			25	96	**121**
	Hot water/ steam				12	**12**
	Hand weeding	15,369	16	100	1,842	**17,327**
	Weed whip	441.5	800	260	1,452	**2,954**
	Habitat modification				324	**324**
	Irrigation Mgmt.	✓	400		✓	**400**
	Host plants squeeze out					**0**
PLANT PESTS	Irrigation Mgmt.				✓	**0**
	Compost tea/microbial in.		84		12	**96**
	Enhance plant health		56		✓	**56**
	Worm castings			✓	120	**120**
	Effective micro-organisms		300		10	**310**
	Wash off plants			✓	✓	**0**
	Resistant varieties			✓	✓	**0**
	Remove plant/tree				✓	**0**
GOPHERS	Traps	21.5	✓		400	**421.5**
SQUIRRELS	EPA exempt bait					**0**
	Traps		✓		110	**110**
	Habitat modification			24		
RATS & MICE	Mechanical traps		✓	500	✓	**500**
	Cat				✓	**0**
MOSQUITOES	Mosquito fish					**0**
	Remove stagnant water				✓	**0**
BEES, WASPS, etc.	Bee Keepers			✓	✓	**0**
	Remove hives	2		48	✓	**50**
OTHER	Glue traps/roaches			✓		**0**
	Heat Treatment	✓		✓		**0**
Total Hours		**15,834**	**1,696**	**957**	**5,106**	**23,569**

Physical Modifications to parks

One of the main objectives of the PHAER Zone system is the physical modification of Yellow areas to make them maintainable as Green, and the modification of Green areas to make them more sustainable. One of the most effective physical modifications is the installation of concrete curbs between turf areas and planter areas which inhibits the grass from creeping into the landscaped beds. The Parks and Recreation Department completed a number of such projects in 2008.

Completed Projects for 2008

Site	Work	Cost
Alameda Park	Concrete curbs around picnic area and planter	$2,004
Alice Keck Park Memorial Gardens	Concrete curbs around planters	$6,000
Chase Palm Park Parking Lot	Concrete curbs along turf edge and parking lot	$31,404
Hidden Valley Park	Concrete curbs along turf edge of upper lawn	$1,800
Hilda Ray Park	Concrete curbs along turf edge and parking lot	$1,560
La Mesa Park	Concrete curbs along turf edge and parking lot	$17,280
Orpet Park (upper)	Concrete curbs around planters	$15,873
Plaza Vera Cruz	Concrete curbs around planters	$30,600
	Total	**$106,521**

The parks listed above are managed as Green parks. The physical modifications make the Green status more sustainable, and reduce labor hours required to maintain the site.

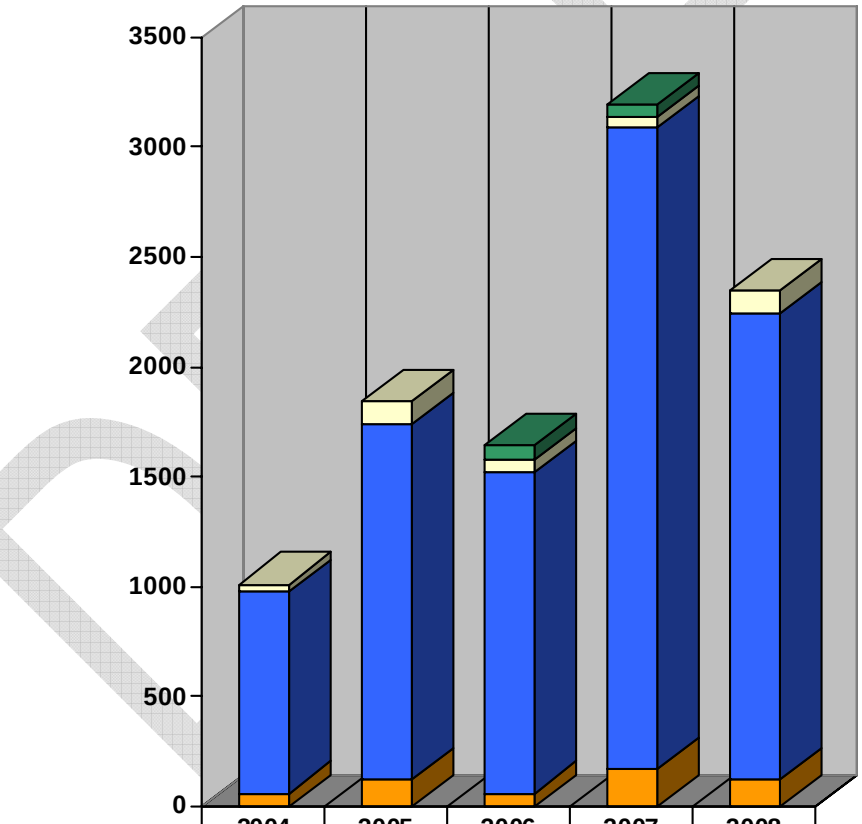
Total Mulch Use

Mulch has been found to be effective in suppressing the growth of annual weeds. The table below shows the types of mulch applied for 2008.

Mulch Use Table

Yards of Mulch by Type	Airport	Creeks	Parks/Golf	Public Works	City Totals
Biosolids	N/A		465		**465**
Woodchips	N/A	102	1,660	120	**1,882**
Total Yards	**N/A**	**102**	**2,125**	**120**	**2,347**

Mulch Use Comparison Chart



	2004	2005	2006	2007	2008
Airport	N/A	N/A	60	53	N/A
Creeks	30	100	60	50	102
Parks/Golf	921	1620	1460	2917	2125
Public Works	59	120	60	171	120
Total Yards	**1,010**	**1,840**	**1,640**	**3,191**	**2,347**

VII. EFFECTIVENESS OF ALTERNATIVE PRACTICES IMPLEMENTED

In general, the majority of alternative practices are more labor intensive and costly, and not as effective as Yellow and Red classified pesticides. However, there are occasions when a Yellow or Red material is also not effective in controlling a pest problem. While most Green materials and practices provide only moderate control of pest populations, there have been some successes. The effectiveness of alternatives for the biggest pest problems encountered is reviewed below.

- **Weeds**: A variety of alternatives are used to provide moderate effectiveness and control including: weeding, weed whipping, mulching, mowing, flame torch (in designated safe areas), and the Aquacide Steam Weeder. These alternatives are significantly more labor and cost intensive and not as effective as Yellow materials. Alternative food grade or EPA exempt chemicals, such as the clove oil based Burnout II, have not proven effective.
- **Insects / Mollusks:** Results are mixed for combating insects and mollusks. For some insects, there are no known effective alternatives. Some alternatives can be very effective but expensive, such as removing non-resistant plants and replacing them with resistant varieties. However, the following alternatives have proven successful against insects and mollusks:
    - Sluggo for snails and slugs
    - Worm castings for white fly
    - Insecticidal soap for aphids
    - Neem oil as a dormant spray
    - Bti for mosquitoes
- **Disease:** No effective alternative has been found for most diseases. Where possible, staff focuses on preventative treatments to enhance plant health. Once disease strikes, pesticides are generally required to combat it.
- **Gophers:** For the most part, mechanical traps are being used City-wide. Traps have been found to be moderately effective and are more expensive than rodenticides due to higher costs of purchasing, installing, monitoring, and cleaning out traps.
- **Ground Squirrels:** Mechanical trapping, using snap and electrical traps, is the primary method of control at this time. This method is moderately effective at controlling populations. More effective alternatives are being researched. Some control has been achieved using food grade baits. Both trapping and baiting have proven very labor intensive.
- **Mice / Rats:** At this time, traps are the primary way of controlling this population. Traps have been found to be moderately effective depending on population size and location and available food sources. Positive public perception seems to far outweigh the costs of using traps. Traps have also shown themselves to be very effective in controlling rodents on downtown State Street and at Coast Village Road
- **Termites:** Building Maintenance now only uses heat treatments to control drywood termites. Heat was found to be equally effective as pesticides and without the chemical residues. However, costs are 50% higher at this time.

VIII. PROPOSED CHANGES TO PEST MANAGEMENT PRACTICES

Alternative Practices Proposed for 2009

The upcoming year will pose new challenges due to the financial climate. Budget considerations and the reduction of staff may require a change in service levels and aesthetic expectations or a greater reliance on more cost effective traditional pesticides. Departments will continue to seek "least toxic" alternatives that provide higher benefit to cost ratios. Departments will also continue to use alternatives found effective in the past five years unless more cost-effective alternatives are found. Departments propose the following for 2009:

- Parks will continue to implement the PHAER Zone model of Integrated Pest Management and continue studying alternative materials and methods. Parks will begin experimenting with sheet mulching. Sheet mulching is the application of cardboard below a layer of mulch to inhibit weed growth. Parks will be applying this method at the Spencer Adams facility, Alice Keck Park Memorial Gardens and MacKenzie Park.
- Golf will continue to develop environmentally sound management practices. This will include the use of bio-pesticides/insecticides and the introduction of disease resistant varieties of turfgrass.
- Airport will standardize least toxic approaches for combating specific pests and will refine their strategy for controlling weeds on the airfield.

IX. CONCLUSION

The City saw an overall reduction in pesticide use in 2008. The reduction of Yellow materials to treat mosquitoes at the Airport, and the use of traps instead of Yellow materials for rodent control at the Waterfront caused a City-wide reduction from 1,646 units in 2007 to 1,132 units in 2008. This includes a decrease in the use of Red materials from 32 units to 25 units and a decrease in the use of Yellow materials from 1,571 to 868, but an increase in the use of Green materials from 43 units to 239 units.

During these times of reduced budgets, it is critical for City staff to find cost effective, low risk, viable alternatives so that pesticide hazards may be reduced further and the overall efficiency of IPM practices may increase. To do so, staff must pursue IPM training with regional IPM groups, and research on the use and effectiveness of alternative materials and methods.

Also critical to reducing pesticide hazards in the City of Santa Barbara is the continuation of community outreach and public education. Because of this community outreach, the public will become more aware of the City's greater reliance upon low risk IPM alternatives.

X. ATTACHMENTS

ATTACHMENT A: APPROVED MATERIALS LIST

Product Name	Active Ingredient	ZONE	Tier	Type
Advance Ant Bait	Orthoboric Acid	Green	3	Insecticide
AllDown	citric acid, acetic acid, garlic	Green	3	Herbicide
Avert Cockroach Bait Station	Abamectin B1 0.05%	Green	3	Insecticide
Avert Cockroach Gel Bait	Abamectin B1 0.05%	Green	3	Insecticide
Bactimos Pellets	Bt	Green	3	Insecticide
Bactimos Wettable	Bt	Green	3	Insecticide
Bio-Weed	corn gluten	Green	3	Herbicide
Borid	Orthoboric Acid	Green	3	Insecticide
Borid Turbo	Orthoboric Acid	Green	3	Insecticide
BurnOut 2	clove oil	Green	3	Herbicide
Cinnamite	cinnamaldehyde	Green	3	Insect/Fung
Dipel Flowable	Bt	Green	3	Insecticide
Drax Ant Kill PF	Orthoboric Acid	Green	3	Insecticide
EcoExempt	Wintergreen Oil	Green	3	Herbicide
EcoExempt D	2-Phenethyl propionate 4.5% Euginol (clove oil) 1.75%	Green	3	Insecticide
Embark	mefluidide	Green	3	Growth Regulator
GreenErgy	Citric, Acetic Acid	Green	3	Herbicide
Kaligreen	potassium bicarbonate	Green	3	Fungicide
Matran (EPA Registration Exempt)	clove oil	Green	3	Herbicide
Natura Weed-A-Tak	clove oil	Green	3	Herbicide
Niban	Isoboric Acid 5%	Green	3	Insecticide
Safer Soap	potassium salts of fatty acids	Green	3	Insecticide
Sluggo	iron phosphate	Green	3	Other
Summit BTI Briquets	Bt	Green	3	Insecticide
Teknar HP-D	Bti	Green	3	Insecticide
Terro II	Orthoboric Acid	Green	3	Insecticide
Vectobac G	Btk	Green	3	Insecticide
VectoLex CG	bacillus sphaericus	Green	3	Insecticide
Victor Wasp and Hornet Killer	Mint Oil 8% & Sodium Lauryl Sulfate 1%	Green	3	Insecticide
Agnique MMF	POE Isoocatadecanol	Yellow	2	Insecticide
Aliette	fosetyl aluminum	Yellow	2	Fungicide
Altosid B	methoprene	Yellow	2	Other
Altosid L	methoprene	Yellow	2	Other
Altosid P	methoprene	Yellow	2	Other
Altosid XR	methoprene	Yellow	2	Other
Aquamaster-Rodeo	glyphosate	Yellow	2	Herbicide

Product Name	Active Ingredient	ZONE	Tier	Type
Avid	abamectin	Yellow	2	Miticide/Insecticide
Dormant	petroleum oil	Yellow	2	Insecticide
Green Light	Neem oil	Yellow	2	Insecticide/Fungicide
M-PEDE	potassium salts of fatty acids	Yellow	2	Insecticide
Prostar 70 WP	flutolanil	Yellow	2	Fungicide
Rose Defense	Neem oil	Yellow	2	Insect/Fung
Roundup Pro	glyphosate	Yellow	2	Herbicide
Safticide Oil	petroluem oil	Yellow	2	Insecticide
Stylet Oil	Petroleum distillates	Yellow	2	Insecticide
Sulf-R-Spray	Parafin oil, sulfur	Yellow	2	Fungicide
Superior Spray Oil	petroleum distillates	Yellow	2	Insecticide
Surflan	oryzalin	Yellow	2	Herbicide
Surflan AS	oryzalin	Yellow	2	Herbicide
Termidor SC	Fipronil	Yellow	2	Insecticide
Triact	Neem oil	Yellow	2	Insecticide/Fungicide
Trilogy	Neem oil	Yellow	2	Insecticide/Fungicide
Wasp-Freeze	allethrim	Yellow	2	Insecticide
Wilco Ground Squirrel Bait	diphacinone	Yellow	2	Other
XL 2G	benefin; oryzalin	Yellow	2	Herbicide
All Special Circumstance materials will continue to require exemptions granted by the IPM Advisory Committee, as provided in the City of Santa Barbara IPM Strategy				
Bayleton	triadimafon triazole	S. C.	1	Fungicide
Conserve	spinosad	S. C.	1	Insecticide
Fumitoxin	Aluminum phosphide	S. C.	1	Rodenticide
Manage	halosulfuron methyl	S. C.	1	Herbicide
Medallion	fludioxonil	S. C.	4	Fungicide
Quick Pro	glyphosate/diquat	S. C.	1	Herbicide
Reward	diquat dibromide	S. C.	1	Herbicide
Rubigan	fenarimol	S. C.	1	Fungicide
Rubigan EC	fenarimol	S. C.	1	Fungicide
Subdue	metalaxyl	S. C.	1	Fungicide
Zp Rode	zinc phosphide	S. C.	1	Rodenticide