

# Identifying and reducing pollutants from residential neighborhood runoff

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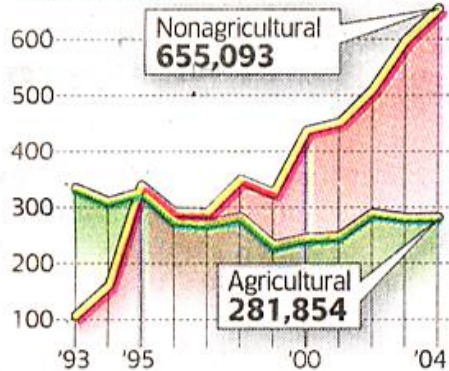
ANR Statewide Conference  
Water Quality Issues Impacting Production  
and Urban Agriculture  
Ontario, April 10, 2013



## Pyrethroid use in California

Commercial use of pyrethroid pesticides in California has been increasing dramatically, mainly because of urban use. The data below do not include usage of retail products by homeowners, which does not have to be reported to regulators and is suspected to be much greater.

POUNDS OF PYRETHROID-ACTIVE INGREDIENT USED ANNUALLY IN CALIFORNIA  
700 (thousands)



Sources: Prof. Donald Weston, UC Berkeley  
Sacramento Bee/Nam Nguyen

Sacramento Bee  
July 14, 2006

# State toughens rules on a household pesticide

## Low levels of pyrethroid products kill aquatic life

By Matt Weiser  
BEE STAFF WRITER

California next month will begin to regulate a broad class of pesticide that has become the dominant home and garden bug-killer.

The state Department of Pesticide Regulation in August will notify manufacturers of pyrethroid insecticides that they must share data on their products or those products will be banned from sale in California. The data will drive a regulatory review that could result in use restrictions or a ban on specific products.

In doing so, California steps out ahead of the federal government and other states in regulating pyrethroids, found to be deadly to aquatic life at very low concentrations.

Mary-Ann Warmerdam, director of the Department of Pesticide Regulation, said it will be the biggest pesticide regulation effort in state history, involving 600 consumer products sold in hardware stores, garden centers and pet stores.

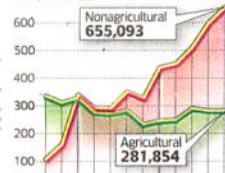
"We know we have enough caution flags, and that requires a

► PESTICIDE, Page A4

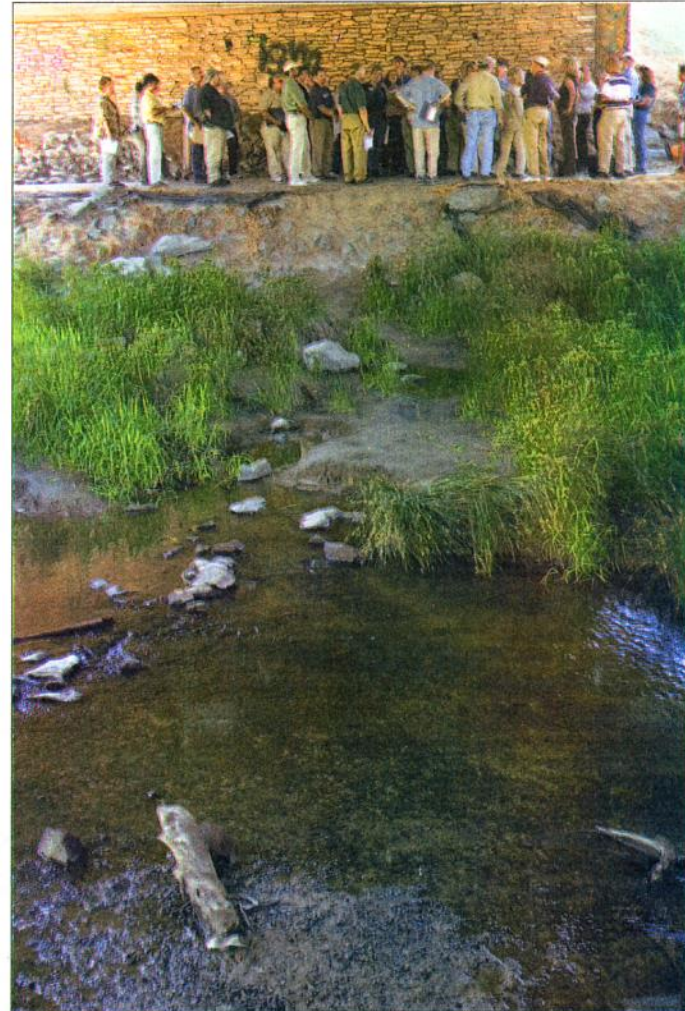
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Sacramento Bee/Jay Mather

Researchers address people from government agencies Thursday at Roseville's Pleasant Grove Creek. The pyrethroid class of pesticide has been found in stream sediment at levels toxic to tiny crustaceans.

# Pollutants From Residential Runoff

- Residential Neighborhood study
- Landscape wash-off study
- Applying lessons

# Pesticides in Residential Runoff

## Study Site Selection

- 8 sites
  - 4 each in Sacramento (N. Cal) and Orange (S. Cal) Counties
- Criteria
  - Single family homes
  - 4-20 years old
    - Lot size
    - Demographics

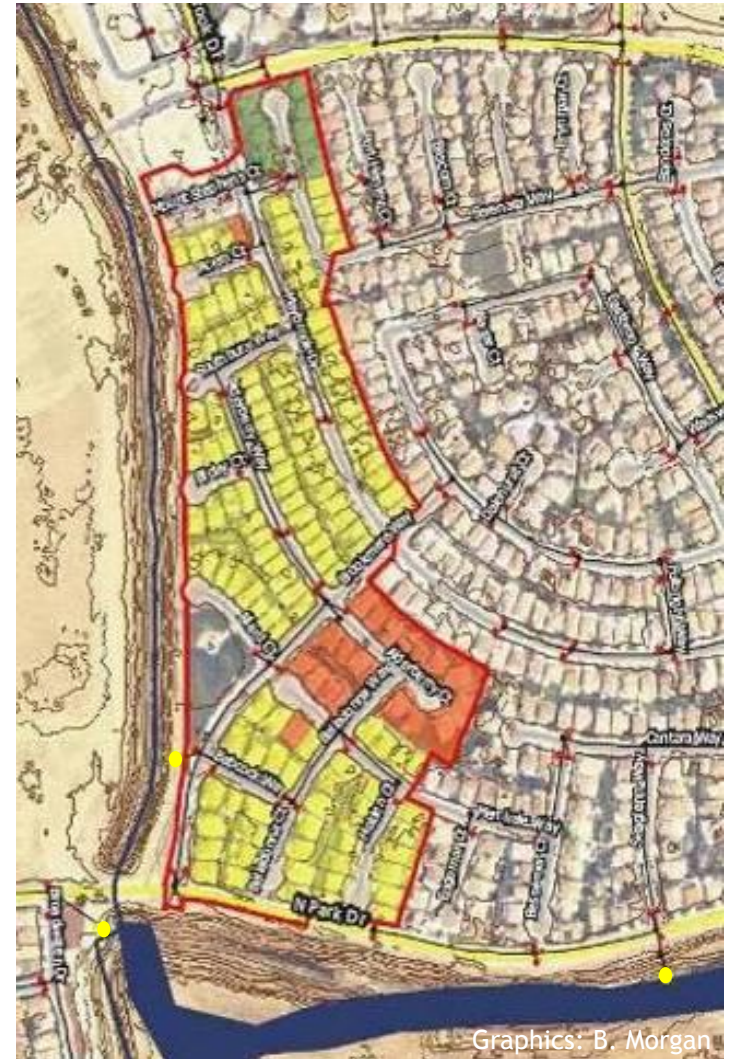


Graphics: B. Morgan

# Pesticides in Residential Runoff

## Site Selection and Sampling Frequency

- Storm drain maps
  - Locate outfalls
  - Delineate drainsheds
  - Identify lots
  - Verify land use
- Sampling frequency
  - 2006 through 2010
  - Weekly, biweekly, monthly
  - Up to 5 early storms
  - >730 samples collected



# Water Sample Collection

UC Riverside

## Gan Lab

### Nutrients

Nitrate, TKN,  
Phosphate, Total P

### Pesticides

diazinon, chlorpyrifos,  
pyrethroids (9), fipronil

### Drinking Water COCs

TOC, DOC, Br<sup>-</sup>, Cl<sup>-</sup>,  
TDS, TSS, turbidity

## Yates Lab

### Pathogen indicators

*E. coli*

Total coliforms

Somatic coliphages

Male-specific coliphages

Enterococci

*Clostridium perfringens*

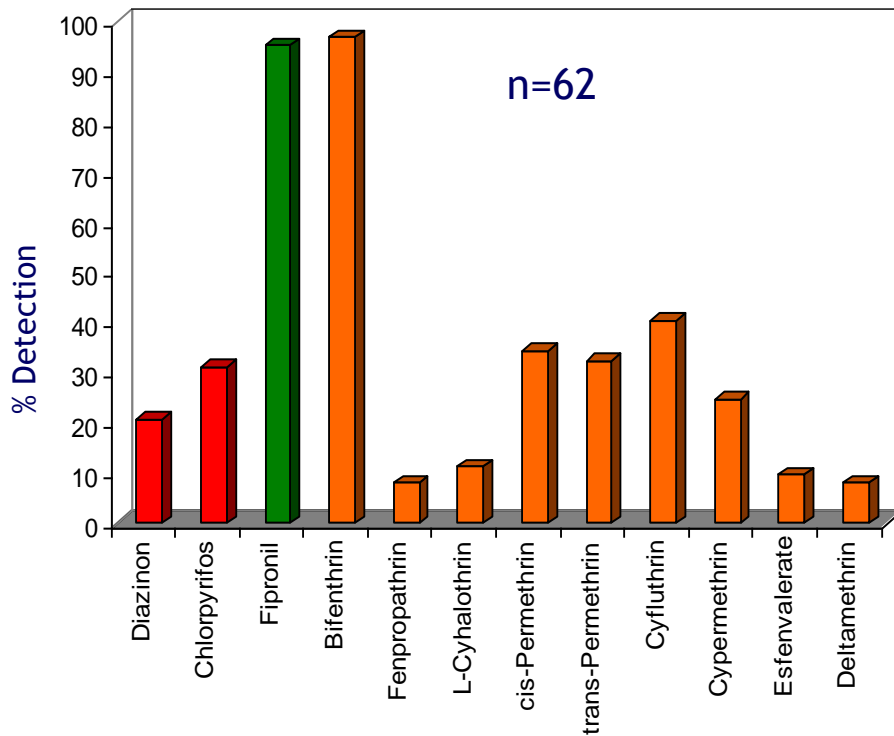
### Pathogens

*Giardia*

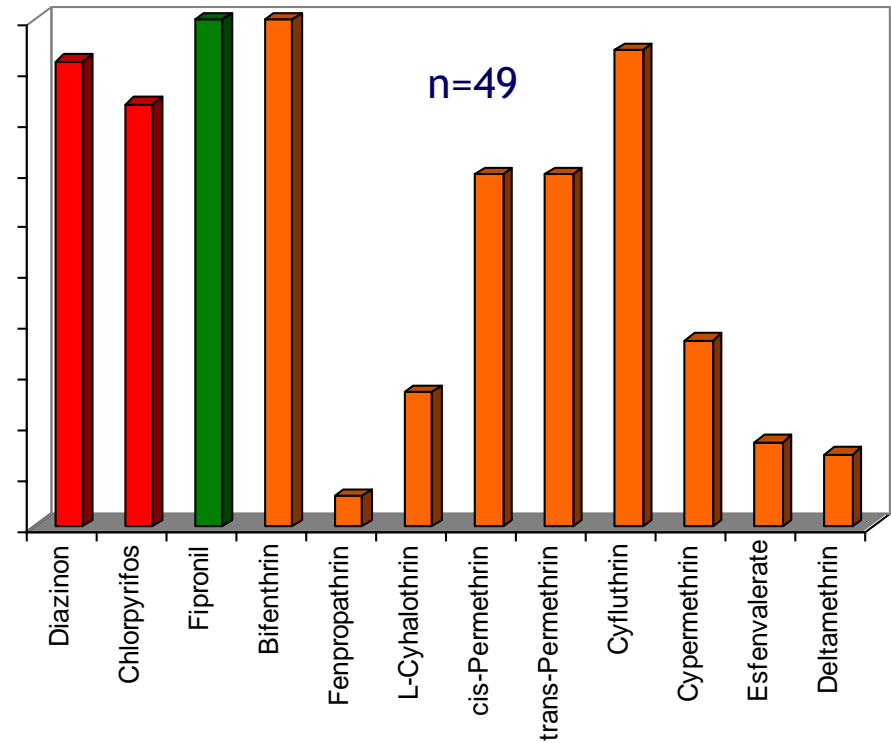
*Cryptosporidium*

# Pesticide Detection Rates

## Sacramento County



## Orange County



# Pesticide Concentration

## Orange County neighborhoods

	Site A		Site B		Site C		Site D	
	Max	Median	Max	Median	Max	Median	Max	Median
diazinon	2,086	2.8	63.9	1.2	344	4.3	253	2.6
fipronil	10,004	75.4	382	76.6	1,652	129	656	119
bifenthrin	287	36.5	138	12.6	6,121	12.9	709	13.9
no. samples	49		52		53		44	

Concentrations are in ng/L (ppt)

	96 hr LC <sub>50</sub>	organism
diazinon	436	<i>Ceriodaphnia dubia</i>
fipronil	140	<i>Americamysis bahia</i>
bifenthrin	50	<i>Ceriodaphnia dubia</i>
bifenthrin	9.3 (1-3)	<i>Hyaella azteca</i>





# Landscape Demonstration Sites

South Coast Research & Extension Center



**Typical**

# Landscape Demonstration Sites

South Coast Research & Extension Center



**LID 1**

# Landscape Demonstration Sites

South Coast Research & Extension Center



**LID 2**



# Designed for Data Collection

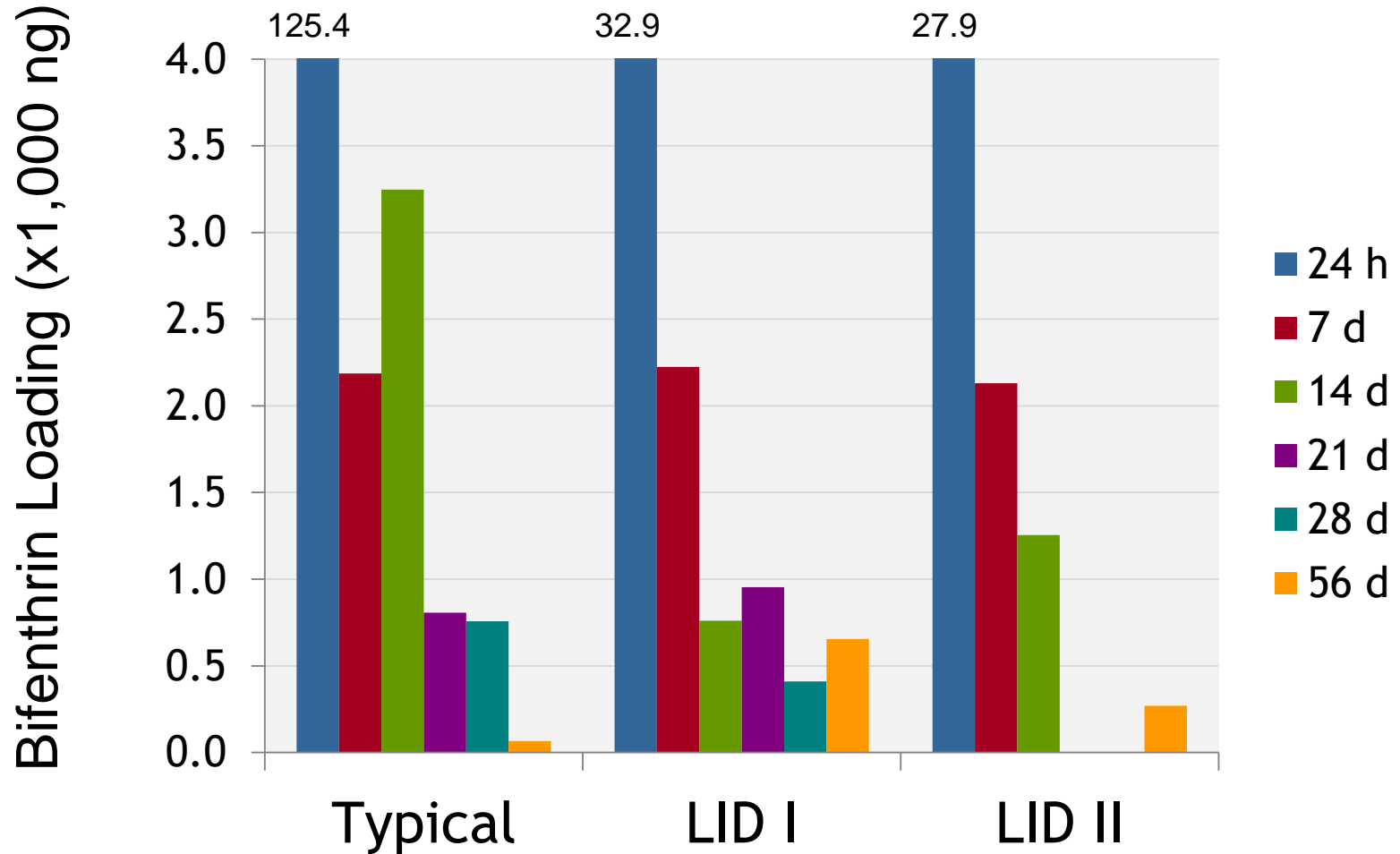


# Pesticide Treatments

- **Lawn and Garden Treatment**  
Bifenthrin RTU hose-end product on landscape
- **Perimeter Pesticide Treatment**  
Fipronil fan spray around structure perimeter
- **Approx 1 g a.i. of each applied**
- **Hardscapes washed at defined intervals**

# Bifenthrin Loading

## Hardscape Washing

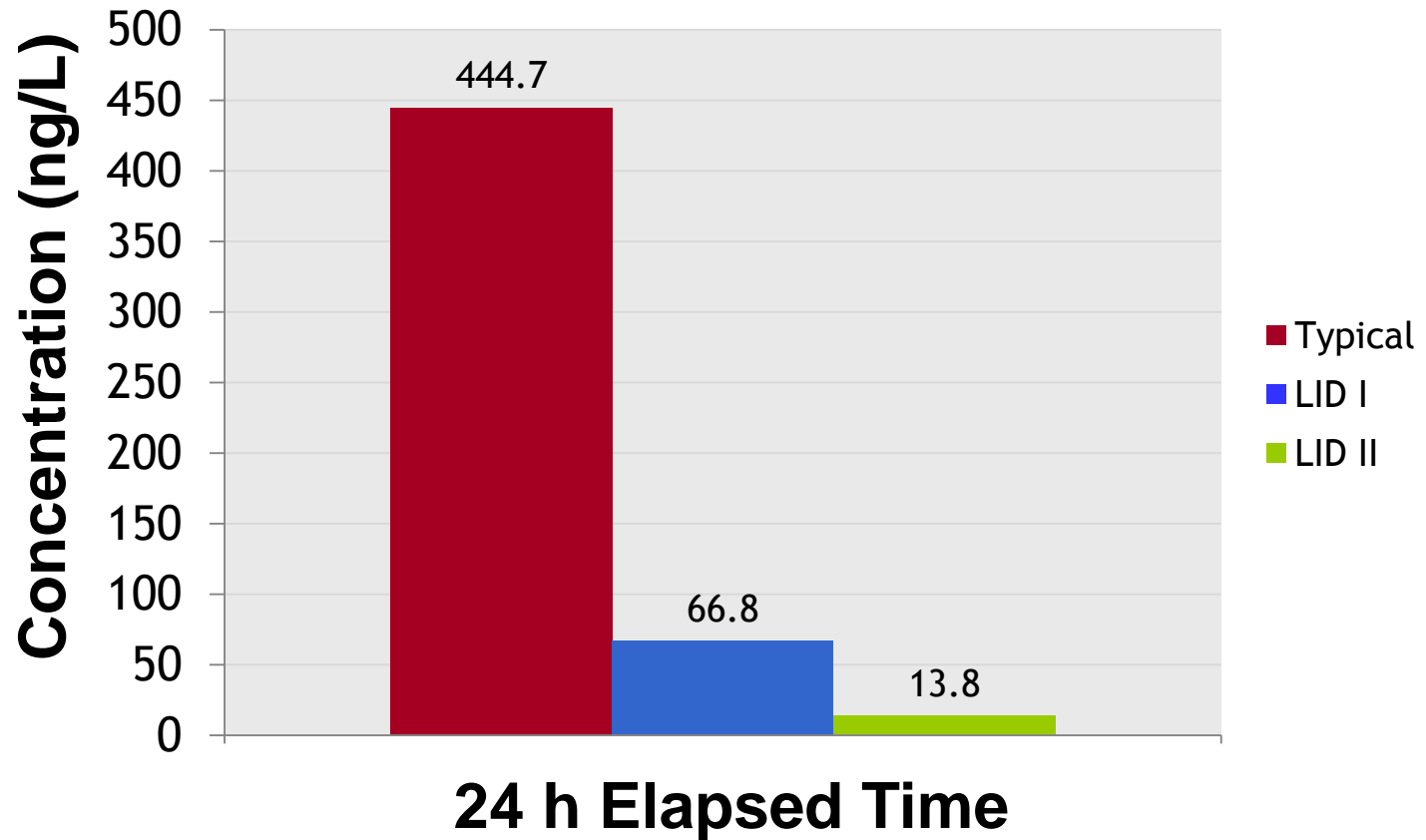


Total recovered 0.13g

0.038g

0.032g

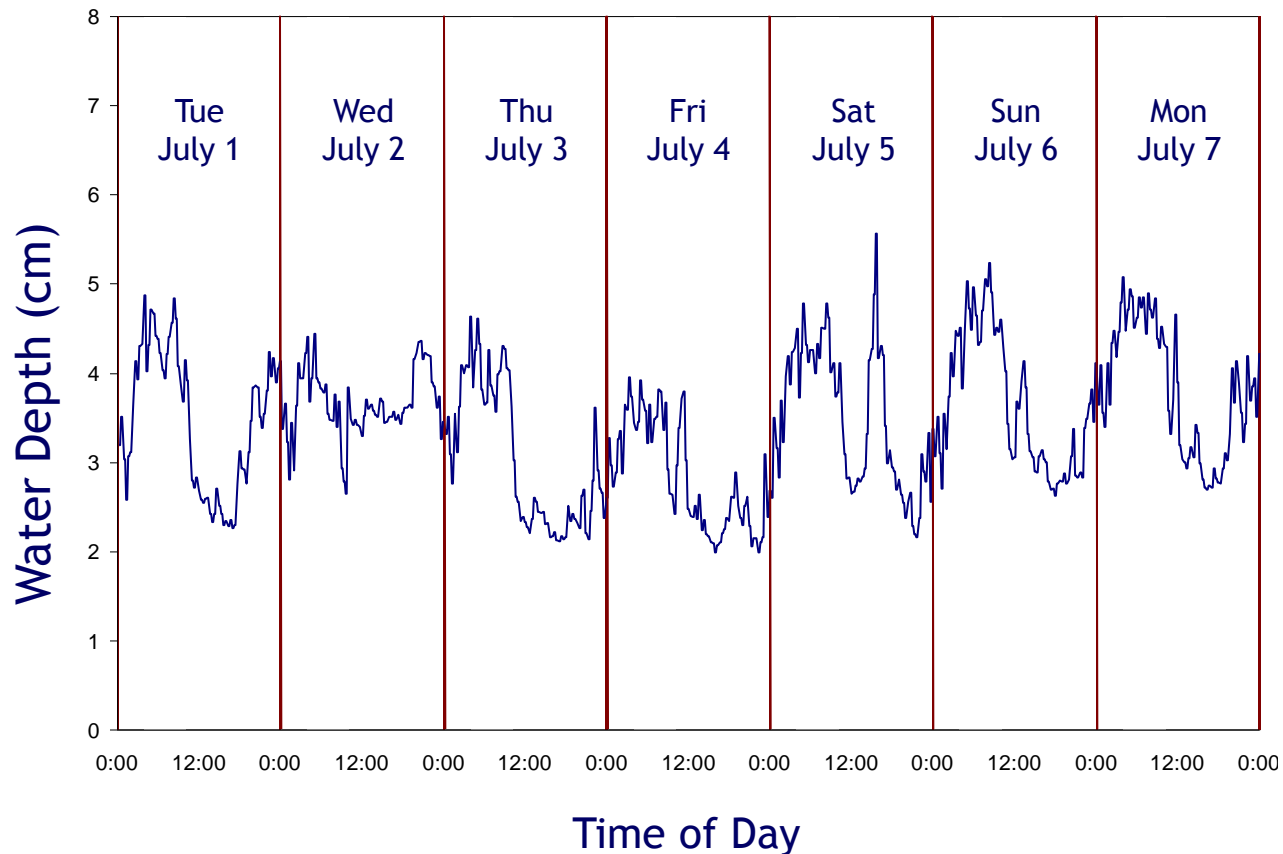
# Fipronil In Wash Water





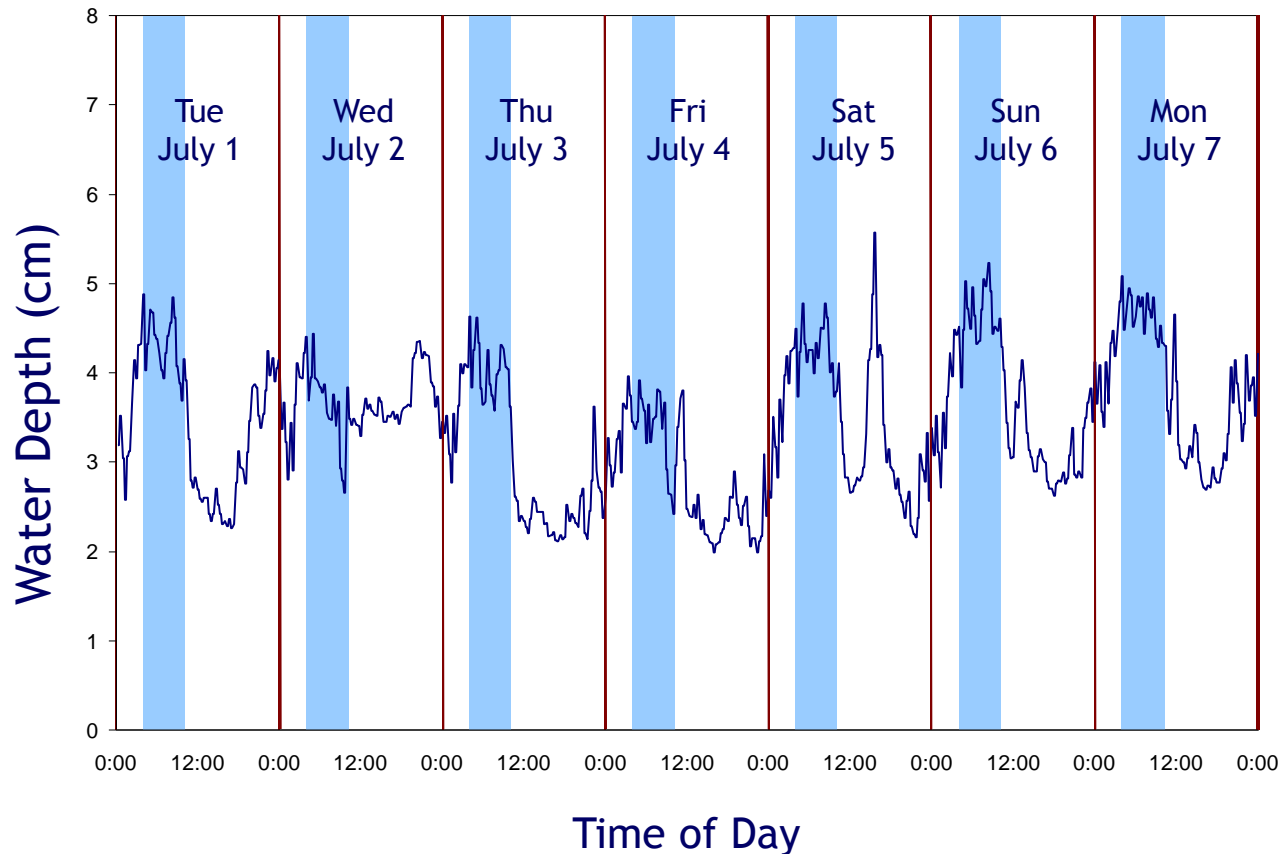
# Dry season runoff patterns

## Daily Periodicity



# Dry season runoff patterns

## Daily Periodicity



# Landscape Features

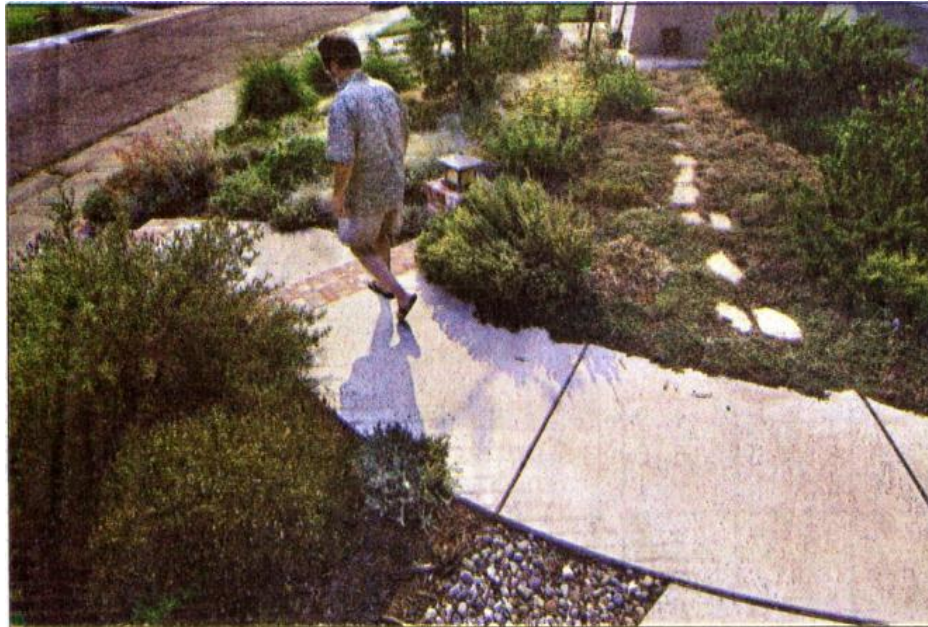
## Objectives

### Minimize runoff

- Don't generate it
  - Reduce irrigation requirement- Plant Selection
  - Target applications properly
  - Manage application rate
- Retain it on-site



# HOME & GARDEN



Randall Benton/rbenton@sacbee.com

Rick Soehren turned a typical suburban lawn into a water efficient garden filled with Mediterranean and California native plants. He loves to watch the garden change with the seasons. "It changes daily. But there's always something in bloom," he says.

## They said goodbye to thirsty lawns

By Pat Rubin

[prubin@sacbee.com](mailto:prubin@sacbee.com)

**N**either days of blasting, furnace-like heat nor hours of relentless sun-

and red – flowers. The thyme walk across the front of Soehren's house is a haze of purple, and California poppies spread their cheerful orange

# Landscape Features



Photo: D. Roberts

# Landscape Features



Photo: D. Roberts

# Landscape Features



# Pollutants From Residential Sources



**Thank you**

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Photo: D. Roberts