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Survey of Pesticide Use by Homeowners in Two California Residential Neighborhoods

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Introduction

Runoff from urban landscapes has been cited as an important contributor of pesticide loading to California surface waters (Ensminger, 2013). To help develop appropriate mitigation measures, the Department of Pesticide Regulation (DPR) is attempting to determine the nature of pesticide applications made to urban landscapes. Little is known about the relative contribution of pesticides from applications made by pesticide control operators (PCO) compared to those of residential homeowners. Applications made by PCOs are recorded within DPR's Pesticide Use Reporting (PUR), however this system does not track pesticide use by residential users. The purpose of this survey was to evaluate the current practices of homeowners in addressing pest management issues. Survey areas were chosen based on their proximity to existing DPR monitoring locations (Budd, 2015; Ensminger, 2015).

Objectives

1. Determine percentage of residences using pesticides on property for pest management.
2. Determine percentage of residences using a PCO, gardener, Home Owner Association (HOA), or applying pesticides themselves to address pest issues.
3. Evaluate the frequency and areas of applications.
4. Determine the primary pests of concern.
5. Evaluate choice of products by residents who apply pesticides themselves.
6. Evaluate any regional differences in pest management practices.

Methods

Residential addresses were compiled from delineated neighborhoods in Northern (NorCal) and Southern (SoCal) California (Figures 1 and 2). The chosen neighborhoods represent contributing runoff areas to three DPR monitoring stations (FOL002, FOL003, SC3) associated with DPR Study 299 (Ensminger, 2015) in Northern California and Study 270 (Budd, 2015) in Southern California. The residential communities in both regions are composed primarily of single family structures. The Southern California survey was conducted on August 9–10th, 2015, and the survey in Northern California was conducted on November 7th, 2015. Each residence was marked as “Responded”, “Not Home”, “Did not answer/Asked to come back”, or “Refused to answer/No solicitor sign posted”. A distinction was made between the “Did not answer” and “Refused to answer/No Solicitor sign posted” groups to help identify potential respondents for future surveys. Each participant was asked a series of five questions (Appendix 1) designed to determine who is primarily responsible for outdoor pest management on the property, as well as where and how often pesticides are applied. For the purposes of this survey, all survey participants are characterized as “Homeowners”, and applications made by “Self” were defined as applications made by the respondent or another resident in the household. Participant responses were recorded and tallied. Any additional information given from participants was also noted. Questions the participant didn’t answer or was unable to respond to were marked as “Unknown”. Percentages were calculated based on number of respondents for individual survey questions.

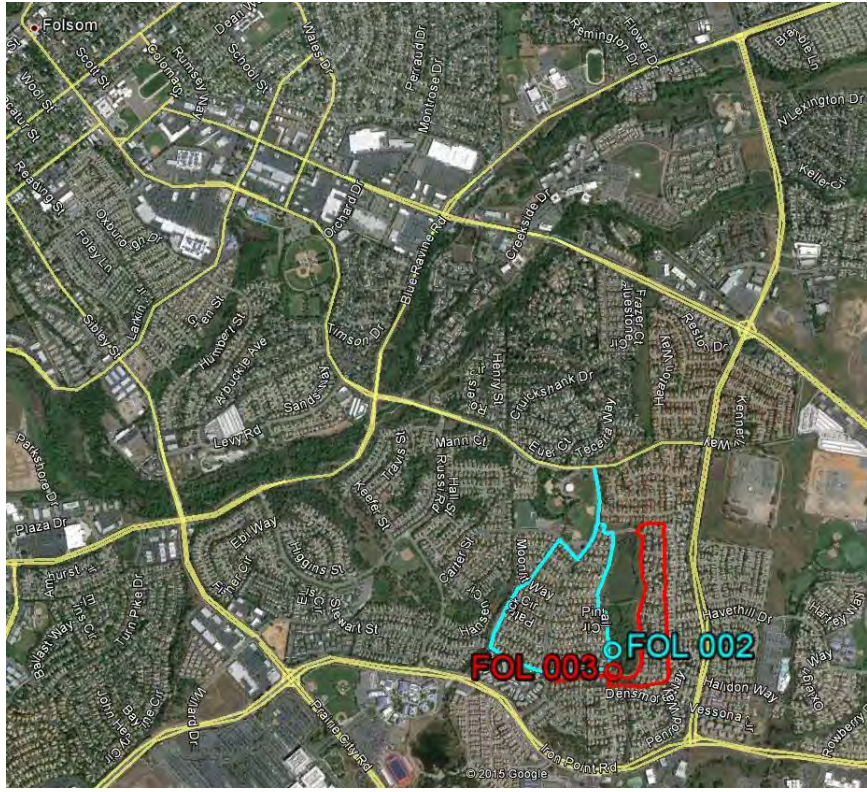


Figure 1. Surveyed residential neighborhoods in Northern California

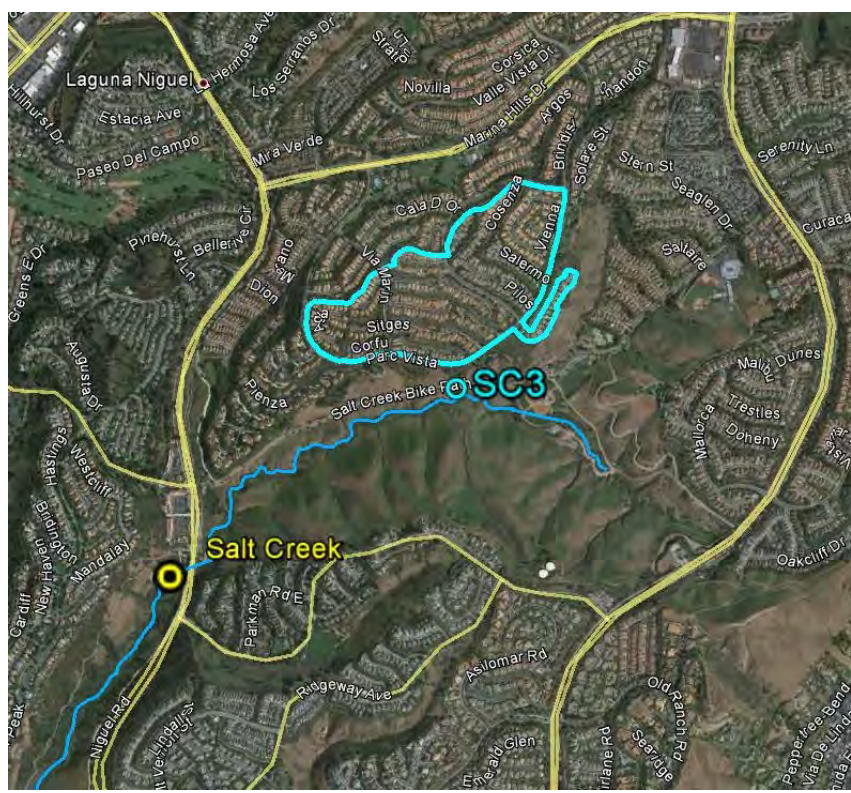


Figure 2. Surveyed residential neighborhood in Southern California

Results

A total of 699 homes were visited during the two regional surveys. The majority (64%) of the homeowners were not at home at the time of the survey. There was a 71% response rate among contacted residences (Table 1).

Table 1. Survey response rates for Northern (NorCal) and Southern (SoCal) California

Response	NorCal	SoCal	Total (%)
Responded	97	81	178 (71)
Did not answer	27	12	39 (16)
Refused to answer/No Solicitor Sign	19	13	32 (13)
Contacted Residences	143	106	249

The largest group of surveyed homeowners utilize a PCO (39%) for pest management, a third apply pesticides themselves (33%), while the use of gardeners (6%) and HOAs (1%) are not as common. A quarter of respondents (26%) reported no pesticide use on their property (Figure 3, Appendix 2). Approximately 4% of homeowners use a combination of applicators (Figure 4). Regionally, in Northern California there were slightly fewer homeowners hiring a PCO and more reporting no pesticide use. Results from the current survey align with those found previously during an extensive phone survey conducted within four California watersheds (Flint, 2003). Two of the previously surveyed watersheds: Arcade Creek in Northern California and San Diego Creek in Southern California are in close proximity to those in the current study and therefore serve as comparative indicators of temporal trends in behavior. Flint (2003) also found residents in Southern California are more likely to have a professional apply pesticides compared to residents in a Northern California (48%, 37%, respectively), and less likely to apply themselves (27%, 38%). The trends in regional differences can be explained by higher pest pressures observed in Southern California (Flint, 2003). The relative agreement between survey results indicates a consistent trend in resident behavior over time.

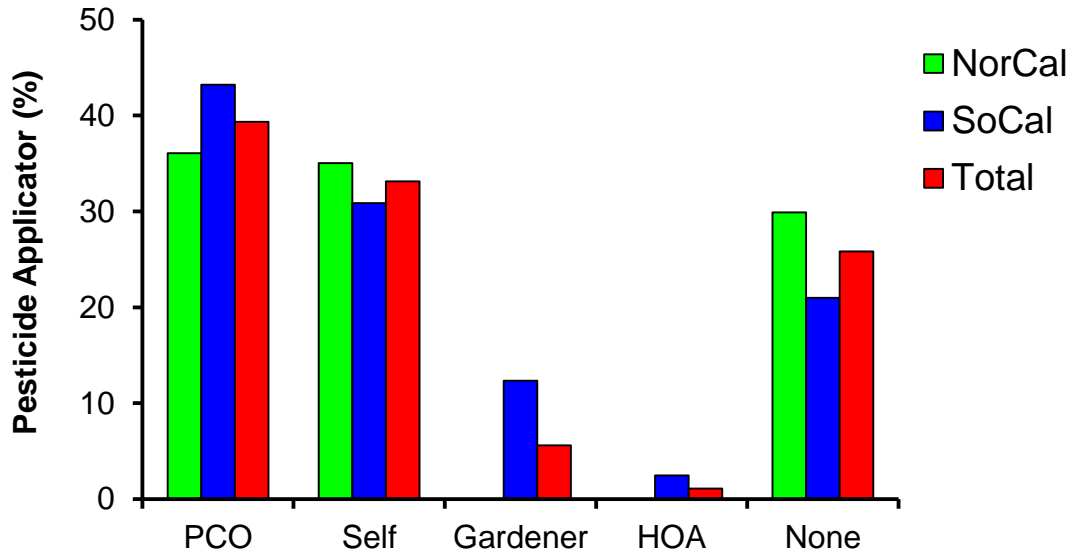


Figure 3. Percent* responses for individual applicator use by homeowners

*Percentages based on total number of respondents; for each question respondents could answer more than one category (resulting in total >100%).

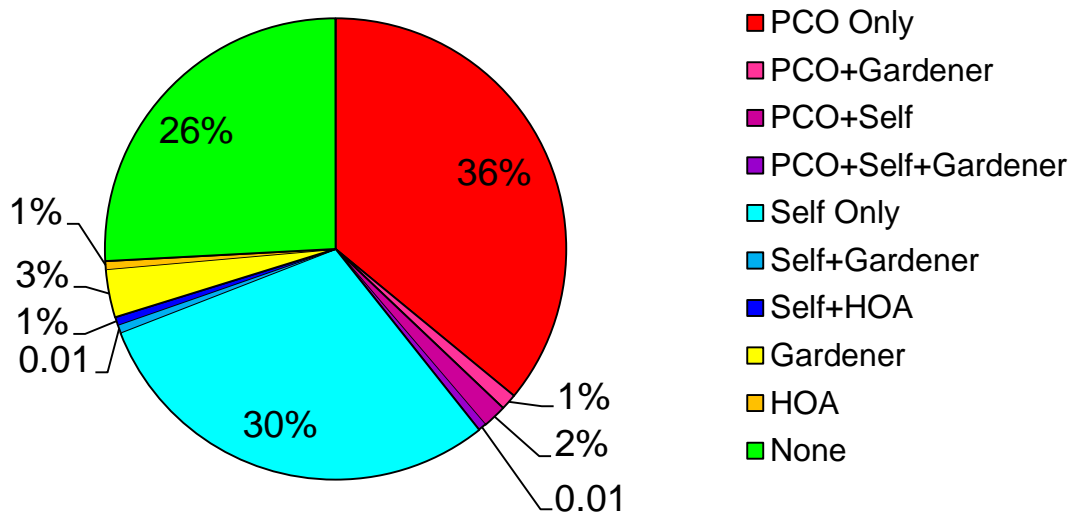


Figure 4. Percent responses for combined applicator categories

In Northern California, 14 individual PCOs were identified, with 20% of the contracts represented by large PCOs. By contrast, 12 companies were reported in Southern California, 63% of which represented by large PCOs. For the purpose of this survey, four companies were defined as “large PCOs”; all of which have regional offices throughout California. Most PCO contracts are scheduled for quarterly visits (36%) (Table 3). Homeowners who apply pesticides themselves make applications “infrequently” or “whenever necessary” (43%), indicating a lower application frequency than professional contracts. Most applications are made to the perimeter of the foundation (84%). However, a distinction was not made concerning the nature of these applications. For instance, it is a common practice by PCOs to apply a band spray around the perimeter using a backpack sprayer, while most homeowners indicated spot applications were made where pests are noted along the base of the foundation. It is difficult to assess how much material is generally applied by the homeowner during a typical application.

Table 3. Pesticide application frequency, area from survey participants.

Frequency	%*	Application Area	%
Weekly	7	Foundation Perimeter	84
Monthly	9	Driveway	14
Annually	7	Edge	14
Quarterly	36	Other	24
As necessary**	43		

*Percentages based on total number of respondents; for each question respondents could answer either more than one category (resulting in total >100%); **Infrequently

Ants were the most common reported pest, with a higher presence in Southern California (Table 4). Flint (2002) also observed a similar trend in regional pest pressures. Almost half of the respondents indicated spiders as a major pest. Weeds (7%) were less frequently reported as a pest issue (Table 4). This could indicate a higher insecticide use in comparison to herbicides.

Table 4. Reported pest issues (%) from survey participants by region.

	Ants	Spiders	Weeds	Fleas	Other*
NorCal	67	45	12	2	28
SoCal	82	42	8	0	24
Total	73	44	10	1	26

*Examples given include aphids, silverfish, and rats

The majority of homeowners (59%) who apply pesticides themselves could not recall the pesticide products they used. Of those that did offer a response, the majority (63%) indicated a ready-to-use

over the counter product containing one or more pyrethroids. Raidⁱ was the most commonly cited product (17%). Another 17% of respondents recorded using insect traps. Traps are not believed to contribute to offsite movement of pesticides (Pittalwala, 2012). Roundup was the only weed control product cited (8%). Only one homeowner reported applying Termidor, a fipronil containing product. Termidor is not typically available as an over-the-counter product in California. This survey suggests that applications of Termidor made by homeowners are uncommon.

This survey highlights how residents of typical California single family home neighborhoods choose to address their outdoor pest issues. Hiring a PCO is the most popular choice in both regions, followed by applications made by the homeowner. Differences in pest pressure might explain the higher observed pesticide use in Southern California. Approximately 74% of all residents indicated applications made by at least one applicator category on their property, suggesting that pesticides are commonly used on urban landscapes. Information gained from this survey will allow DPR to gain a better understanding of pesticide use patterns within urban landscapes and to target appropriate education and outreach efforts aimed at mitigating pesticide transport to California surface waters.

ⁱThe mention of commercial products, their sources or their use is not to be construed as either an actual or implied endorsement.

References

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Appendix 1. Survey Questions

1. Who takes care of your pests such as insect and weed concerns?

- a. Professional pest control company Name: _____
- b. Home owner association Name: _____
- c. Professional gardener Name: _____
- d. Self

2. How often do you or the professional business apply pesticides for control of pests?

- a. Quarterly
- b. Weekly
- c. Monthly
- d. Other: _____

3. If you use pesticides: What products do you use to control insects, slugs, or weeds?

If others apply: Do you know what products the professional applicators use to control insects, slugs, or weeds?

Answer: _____

4. What pests do you primarily control for? (can be more than one)

- a. Ants
- b. Spiders
- c. Weeds
- d. Fleas
- e. Other: _____

5. Where do you/they typically apply? (can be more than one)

- a. Around perimeter of house
- b. Driveway
- c. Edge of driveway
- d. Other: _____

Appendix 2. Response for individual pesticide applicator categories used by homeowners to manage pests.

Applicator	NorCal		SoCal		Total	
	Count	%	Count	%	Count	%
PCO	35	36	35	43	70	39
Self	34	35	25	31	59	33
Gardener	0	0	10	12	10	6
HOA	0	0	2	2	2	1
None	29	30	17	21	46	26

*Percentages are calculated based on total number of respondents; for each question respondents could answer either more than one category (resulting in total >100%).