

5-9-2022

A Needs Assessment Survey of Southern California Pest Management Professionals

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Recommended Citation

Taravati, S. (2022). A Needs Assessment Survey of Southern California Pest Management Professionals. *The Journal of Extension*, 60(2), Article 5. <https://doi.org/10.34068/joe.60.02.05>

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Cover Page Footnote

I want to thank Sylvia Kenmuir (BASF), Jennifer Gonzalez, Natalee King, Brian McQueen, Candy Dolan, Bobby Maston (Target Specialty Products), Gilbert Aldivrez (Downtown Pest Control), Christine Cornejo (Craig & Sons Termite & Pest Control, Inc.), Dean Wiley (Newport Exterminating), and Andi Moreno (American City Pest & Termite) for helping me with data collection.

A Needs Assessment Survey of Southern California Pest Management Professionals

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Abstract. Pest Management Professionals were surveyed in training workshops/meetings in Southern California between 2015 and 2017 to understand their needs, challenges, and view of integrated pest management. The most encountered pests by pest control technicians were ants, cockroaches, rodents, spiders, termites, and bed bugs. The most challenging pest groups to control were bed bugs, cockroaches, ants, and rodents. The main challenges that professionals faced in doing their work were regulations, followed by managing pests, and customer-related problems. Most participants had a favorable view of IPM. However, they faced several challenges in implementing IPM, among which customer-related issues were the most common.

INTRODUCTION

California, structural pest control licensing is administered by the Structural Pest Control Board (SPCB), a California Department of Consumer Affairs subdivision. California structural pest control technicians, also known as Pest Management Professionals (PMPs), can become licensed in one or more licensing branch: Branch 1, the practice of fumigation using poisonous or lethal gas; Branch 2, the practice of controlling household pests excluding fumigation with poisonous or lethal gases; Branch 3, the practice of controlling wood-destroying pests or organisms by the use of insecticides or structural repairs and corrections, excluding fumigation with poisonous or lethal gases (California Structural Pest Control Board, 2019). As of 23 April 2020, there were 22,719 licensed PMPs in California comprised of 6,086 registered applicators, 12,772 field representatives, and 3,861 operators (California Department of Consumer Affairs, 2020).

In a national survey published by the Environmental Protection Agency (EPA), ants, mosquitoes, and cockroaches were the most common household pests after microorganisms such as bacteria, viruses, mildew, and mold (Whitmore et al., 1992). In another national survey on incidental household nuisance pests, multicolored Asian lady beetles, boxelder bugs, millipedes, and ants were the most common incidental pests of households (Cranshaw, 2011).

Despite the vast expanse of urban areas and the high number of licensed PMPs in California, very few scientific surveys have been performed and published on this vital industry. Limited information is available about California's

most common structural pests and the needs and challenges Californian PMPs face in running their pest control businesses. In a survey by Pest Control Operators of California (PCOC), 42.3% of responders chose ants as the biggest problem in California, followed by rats/rodents (31%) and cockroaches (12.6%). When asked, "Which pest is becoming increasingly more difficult to control?" the most common responses were rats/rodents (51.2%), followed by bed bugs (25.6%) (Harbison, 2018).

Integrated Pest Management (IPM) is a pest control approach that utilizes environmentally-friendly methods and tools to reduce pesticide side-effects such as environmental pollution and health risks. Per California state regulations, all PMPs except Branch 1 license holders must undergo IPM training for license renewal, though little is known about the prevalence of IPM use among license holders or the IPM implementation challenges they face. In this paper, I provide results from a new structural pest control survey study on Californian PMPs.

METHODS

I surveyed a total of 182 PMPs in ten in-person pest control training workshops/meetings in Southern California between 2015 and 2017. Participants were provided with an anonymous printed survey form (shown in Figure 1) containing ten questions. Survey takers were allowed to select multiple choices for the categories of "branches" and "counties" and to write down multiple answers for "pests," "knowl-

Pest Management Survey

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Meeting:	
Company type: <input type="checkbox"/> Pest Control <input type="checkbox"/> Product distributor <input type="checkbox"/> Other (please specify):	
Which branch (es) are you licensed in? <input type="checkbox"/> Branch I <input type="checkbox"/> Branch II <input type="checkbox"/> Branch III <input type="checkbox"/> n/a	
Which branch (es) are you are actively working in? <input type="checkbox"/> Branch I <input type="checkbox"/> Branch II <input type="checkbox"/> Branch III <input type="checkbox"/> n/a	
Which counties are you working in? <input type="checkbox"/> Los Angeles <input type="checkbox"/> Orange <input type="checkbox"/> San Diego <input type="checkbox"/> Imperial <input type="checkbox"/> Riverside <input type="checkbox"/> San Bernardino <input type="checkbox"/> Ventura <input type="checkbox"/> Other:	
Question 1: Please name the <u>most common</u> pest(s) that you constantly (or during most of the year) deal with:	
Question 2: Please name the <u>most problematic</u> pest(s) that you deal with (i.e. species which are hard to get rid of in general)	
Question 3: Please name the <u>most common</u> pest(s) species that you usually encounter in <u>each season</u> : Spring: Summer: Fall: Winter:	
Question 4: Do you see a specific major gap in knowledge for controlling urban pests? Please name and explain. (Examples: Lack of good detection devices for drywood termite, lack of understanding the behavior of a particular species, lack of an effective registered chemical for controlling a species)	
Question 5: What are your main challenges or concerns in doing your job? (e.g. post-treatment customer calls, financial concerns, controlling a particular pest species, regulations, etc.)	
Question 6: Do you believe in IPM as an effective tool for reducing environmental and health hazards? <input type="checkbox"/> yes <input type="checkbox"/> no	
Question 7: How often do you <u>consider</u> using IPM methods for managing pests:	<input type="checkbox"/> never <input type="checkbox"/> sometimes <input type="checkbox"/> often <input type="checkbox"/> always
Question 8: How often do you <u>use</u> IPM methods for controlling pests?	<input type="checkbox"/> never <input type="checkbox"/> sometimes <input type="checkbox"/> often <input type="checkbox"/> always
Question 9: Do you believe that your business may lose money if it implements IPM techniques? <input type="checkbox"/> yes <input type="checkbox"/> no If yes, please explain why and how potentially this conflict can be overcome.	
Question 10: In general, what stops you from implementing IPM in your work? Please name	

Thank you very much for your participation!

Figure 1. Survey form used in this study.

edge gaps,” “challenges,” and “IPM obstacles.” All the forms were collected at the end of each meeting and scanned into PDF files. All the data were manually entered into Microsoft Excel 2013 sheets, where they were processed and analyzed. All the responses were pooled to create a master sheet, and each variable (column) was analyzed separately to produce averages and percentages. For open-ended questions, each answer was manually read and coded into categories. Then,

coded answers were counted and used for producing averages and percentages.

SURVEY RESULTS

Participants held a total of 259 licenses, 9% of which were in Branch 1 (fumigation), 63% in Branch 2 (general household), and 29% in Branch 3 (wood destroying organisms).

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They worked in the following counties: Los Angeles (28.9%), San Bernardino (19.5%), Riverside (18.8%), Orange (17.7%), Ventura (6.3%), San Diego (5.7%), Imperial (1.3%), Santa Barbara (0.4%), San Luis Obispo (0.4%), and other counties (1.1%). Among the participants, 38% actively worked in one county only, 21% in two counties, 15% in three counties, 18% in four counties, and 9% in five or more counties. Sixty percent of the survey participants were licensed in only one branch, while 34% were licensed in two branches and 6% in three branches. Among pest groups (387 responses), ants and beetles were the most and least common pest groups, respectively (Table 1). Among ants (34 responses), the Argentine ant was the most common (59%) species, followed by fire ants (15%), odorous house ants (12%), rover ants (9%), carpenter ants (3%), and thief ants (3%). Among termites (28 responses), drywood termites (64%) were reported more than subterranean termites (36%). Among cockroaches (30 responses), German cockroach was the most common (53%), followed by American (40%) and Oriental cockroach (7%). Among rodents (34 responses), rats were the most common (71%), followed by mice (24%), gophers (3%), and ground squirrels (3%). Among rats (8 responses), roof rats were more common (75%) than Norway rats (25%).

The most common structural pests in spring were ants (32.6%), termites (17.8%), rodents (13%), cockroaches (12.2%), spiders (10.4%), bed bugs (3.9%), fleas (3%), earwigs (1.7%), mosquitoes (1.3%), crickets (0.9%), flies (0.4%), silverfish (0.4%), carpet beetles (0.4%), bees (0.4%), mold (0.4%), moths (0.4%), and wasps (0.4%). In summer, the most common structural pests included ants (44.2%), cockroaches (17.5%), spiders (11.5%), rodents (5.2%), bed bugs (4.5%), termites (6.7%), fleas (3%), bees (2.2%), flies (1.9%), wasps (1.1%), mosquitoes (0.7%), silverfish (0.4%), earwigs (0.4%), and scorpions (0.4%). Fall structural pests were most commonly ants (24.1%), spiders (12.7%), rodents (20.3%), termites (16%), cockroaches (15.6%), bed bugs (4.2%), crickets (1.9%), earwigs (0.9%), silverfish (0.9%), birds (0.5%), bees (0.5%), wasps (0.5%), scorpions (0.5%), mosquitoes (0.5%), and carpet beetles (0.5%). In winter, the most common structural pests were rodents (56.9%), ants (11.2%), cockroaches (10.6%), termites (6.4%), spiders (5.3%), bed bugs (3.7%), earwigs (1.6%), crickets (1.6%), mosquitoes (1.1%), silverfish (0.5%), and scorpions (0.5%).

The most challenging pest groups to control were bed bugs (36.7%), followed by cockroaches (22.8%). A complete list of pests by their difficulty of control is presented in Table 2.

Forty percent of the participants did recognize one or more knowledge gaps in pest control that need to be addressed, while 60% could not think of any. The knowledge gaps recognized by participants were the lack of efficient products/tools (28%), pest control techniques (25%), inspection or detection methods (21.9%), pest behavior (9%),

Table 1. Most Common Pests Encountered by PMPs in Southern California, USA

Pest	No. of responses	Percentage of total responses
Ants	128	33.1%
Cockroaches	82	21.2%
Rodents	58	15.0%
Spiders	39	10.1%
Termites	36	9.3%
Bed Bugs	36	9.3%
Fleas	4	1.0%
Earwig	2	0.5%
Beetles	2	0.5%
TOTAL	387	100%

Note. Each participant had the option to write down one or more pest or pest groups on the survey.

application methods (6.3%), pesticide resistance (3.1%), identification (3.1%), and IPM (3.1%).

The main challenges that PMPs faced were regulations (27.5%), customer-related problems (16%, including difficulties in customer education, unreasonable customer expectations, lack of customer cooperation, online pesticide shopping by customers, and cheap customers), managing pests (13.5%), post-treatment customer calls (11%), financial problems (10%), hiring/licensing/training technicians (8%), overhead costs (3.5%, including health and business insurance), lack of efficient pest control products (3%), managing time (1%), safety (<1%), insecticide resistance (<1%), and other challenges combined (4%).

Table 2. Most Difficult Pests to Control by PMPs in Southern California, USA

Pest	No. of responses	Percentage of total responses
Common bed bug	79	36.7%
Cockroaches	49	22.8%
Ants	31	14.4%
Rodents	21	9.8%
Termites	14	6.5%
Spiders	13	6.0%
Fleas	4	1.9%
Beetles	2	0.9%
Earwig	1	0.5%
Bees	1	0.5%
TOTAL	215	100%

Note. Each participant could write down one or more pest or pest group on the survey.

The majority of participants (97.7%) believed that IPM effectively reduces environmental and health hazards, while 2.3% did not believe so. When asked, “how often do you consider using IPM?” the responses were: always (56.5%), often (30%), sometimes (12.5%), and never (1.1%). When asked, “how often do you use IPM?” the responses were always (35.3%), often (34.5%), sometimes (28.3%), and never (1.7%). When asked about the financial impact of implementing IPM, 87.6% of the participants believed that implementing IPM does not negatively affect their business. In comparison, 12.4% of participants believed that implementing IPM may reduce their revenue. The reasons for not using IPM were customer-related issues (62%) such as customer expectations for spraying and lack of customer cooperation, higher amount of time needed for IPM (22%), high cost of IPM (14%), and failure of IPM in controlling target pests (3%).

CONCLUSIONS

To conclude, data reported in this paper provide quantitative and qualitative insight into the Southern California structural pest control industry. These data also provide a baseline for future Extension and marketing efforts on Southern California structural pest control. In a survey conducted in the western United States, participating PMPs involved in bed bug treatment reported customer-related issues such as “lack of preparation”, “clutter”, “lack of client cooperation”, “lack of education”, “misinformation”, and “high costs” (Sutherland, 2015), which are similar to findings relayed in this article.

In the agriculture sector, a needs assessment survey revealed similar findings in which a lack of a decision-support tool; disbelief in the efficacy of IPM tools; a lack of action/economic thresholds; and a lack of education in pesticide resistance, resistance management, and pest monitoring were some of the major barriers in IPM adoption (Murray et al., 2021).

Ants were the most common structural pest reported in my survey, which is in line with previous reports on national trends in which ants were reported as the most common macroscopic pests in urban areas (Whitmore et al., 1992).

In my survey, bed bugs were reported as the most challenging pest to control in structures which is consistent with similar studies in other US states (Potter et al., 2008). The seasonality of each pest group is an important piece of information that can be useful to Extension agents, pesticide distributors, PMPs, and building managers. For example, results from my survey show that ants were most problematic in or around structures in the summer and least problematic during the winter. In contrast, rodents showed the opposite pattern, being more common around structures in the winter and least common during the summer (Figure 2). Such a difference could be explained by the different physiology of cold-blooded vs. warm-blooded animals. Ants and other arthropods are cold-blooded and are more active in warmer months. Rodents, on the other hand, are warm-blooded and can stay active during fall and winter. Nevertheless, when temperatures drop during the fall, rodents start to seek shelter and move into structures where they become noticed by

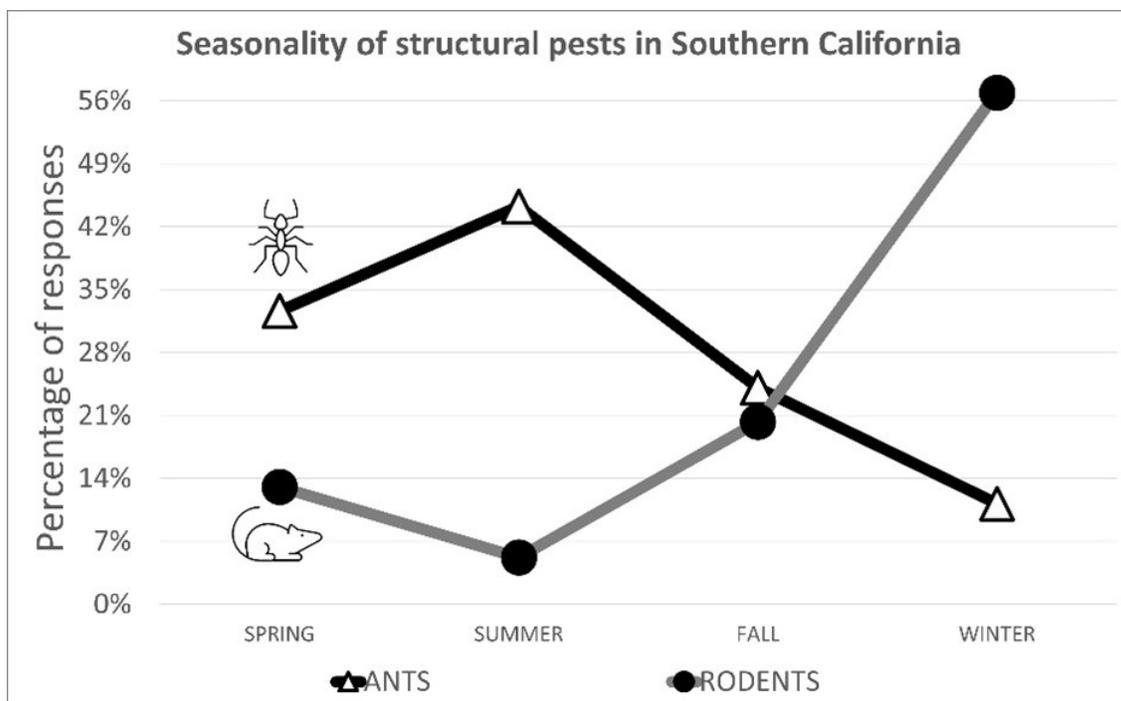


Figure 2. Seasonality of ants vs. rodents’ occurrence as structural pests in Southern California.

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residents (Frantz & Comings, 1976; Himsworth et al., 2013). While data from this paper show that bed bug activity peaks during the summer, their seasonal variation is much smaller when compared to rodents and ants. By knowing the peak season for each pest, one can efficiently plan to purchase the right pesticides, traps, and application equipment in advance and focus on pest-specific education and marketing before the peak season arrives.

PMPs who participated in the survey had an overall positive view of IPM but had challenges implementing it in their day-to-day work. The most common challenge in implementing IPM was customer-related issues. Therefore, pest control operators and state and local agencies need to educate the public to address this issue before expecting IPM to become more pervasive in structural pest control.

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