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## **Does the General Public Relate to the Term "Integrated Pest Management"?**

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**Abstract:** We conducted a random telephone survey of single family residents in San Diego County to gather public opinion related to use of the term "Integrated Pest Management" or its abbreviation. Only a small percentage of participants (4.9%) had heard the term or its abbreviation. When various definitions of IPM were suggested, individuals preferred terms stressing environmental and human safety such as "Earth-Friendly Pest Management" and "Responsible Pest Management." Our survey results show that IPM educators should use different terminology when working with non-professional gardeners or the public in general in order for the audience to relate to the IPM concept.

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### **Introduction**

The term "integrated pest control" was first introduced by Stern, Smith, van den Bosch, and Hagen (1959) to describe a concept of biological and chemical pest control, with the chemical control being used as necessary and in such a way that biological control was least disrupted. Smith & van den Bosch (1967) are widely credited with first introducing the term "Integrated Pest Management" (IPM) as a concept that not only integrates a variety of control strategies but also applies ecological principles to pest control. However, the terminology was not widely used until the mid-1970s (Bajwa & Kogan, 2002).

These IPM concepts originally were directed towards arthropod management in agricultural production systems (Ehler, 2006). Over the last 50 years, the use of IPM has broadened to include all pests and has

expanded to non-crop systems. Professionals in the structural pest control and landscape industries have adopted the terminology within their industries, but their customers are not familiar with the specific term of Integrated Pest Management or its abbreviation, making it more difficult to educate non-professionals about IPM.

One of the obstacles in convincing residential home gardeners and landscapers to adopt an Integrated Pest Management program to control pests in and around their homes is that the terminology is not widely recognized (Anderson, Hollingsworth, Van Zee, Coli, & Rhodes, 1996; Burgess, Kovach, Petzoldt, Shelton, & Tette, 1989; Govindasamy, Italia, Thatch, & Adelaja, 1998). Also, when educators talk about IPM, they use terminology that the audience may not be familiar with rather than less technical terms that the audience could relate to.

These obstacles in communication indicate that educators will benefit from using different terminology to more effectively communicate the concept of IPM to the public. The purpose of the study reported here was to identify public awareness of IPM and to suggest alternate terms that could be used instead of IPM that could more clearly communicate the concept of IPM and foster its adoption.

## Survey Methods

Between September 26th and December 20th 2006, the Social Science Research Center at California State University, Fullerton conducted a random digit dial telephone survey in San Diego County. Interviewers screened randomly selected telephone numbers to locate and complete interviews in English and Spanish with 1,202 respondents, 18 years of age and older, residing in single family detached homes in six cities: San Diego, Carlsbad, El Cajon, Chula Vista, National City, and the Mira Mesa area of San Diego. We established a minimum quota of 200 completed interviews per community. Demographic information is shown in Table 1. The response rate was 66.49%. A response rate at this level promotes statistical confidence in the generalization of survey results to the population of inference (Northrop & Arsneault, 2008).

**Table 1.**  
Telephone Survey Respondent Demographics by Percent Over All Locations

Gender	Female 57.2	Male 42.4				
Age	18- 34 22.1	35 to 54 49.0	55 to 64 15.5	65 and older 13.4		
Primary language	English 78.6	Spanish 16.7	Other 4.7%			
Highest level of education	Less than high school 7.5	High school 17.7	Some college, no degree 20.7	Associate degree 10.0	Bachelor's degree 25.7	Graduate/ Professional degree 18.3
Household income	Less than \$39,999 23.4	Between \$40,000 and	Between \$70,000 and	Over \$100,000 20.1		

		\$69,000 24.5	\$99,999 32.1			
Race/Ethnicity	Caucasian 54.7	Hispanic 26.9	Asian 8.6	African American 3.9	Bi-Racial 2.9	Other 3.0

Because of the large number of comparisons computed, a modification of the Bonferroni correction was used to determine statistical significance. Based on this correction only differences under  $p < 0.005$  are presented.

## Results and Discussion

When asked "Have you ever heard of "Integrated Pest Management?" most survey respondents ( $n = 1134$ ; 95.1%) replied that they had not. Just 58 (4.9%) had heard of the term. Ten declined to answer this question. This is considerably lower than results from similar surveys examining consumer awareness of IPM. In those studies awareness ranged from 19% in Massachusetts (Anderson, Hollingsworth, Van Zee, Coli, & Rhodes, 1996) to 27% in New York (Burgess, Kovach, Petzoldt, Shelton, & Tette, 1989) to 31% in New Jersey (Govindasamy, Italia, Thatch, & Adelaja, 1998). However, even in a study examining the IPM practices of limited resource farmers in Alabama, nearly one third of the farmers were not familiar with the term (Tackie, Jackai, Ankumah, Dingha, Salifu, & Ojumu, 2009).

Table 2 lists the media through which respondents were exposed to the term "Integrated Pest Management." Media are listed in descending order of the total proportion of respondents endorsing each source. The source classified as "Other" was the most common means of exposure to the term (40.4%). Sources classified as "Other" include "Someone at work was talking about it," "Veterinarian office," "At school," "A pest control company," "A magazine," "Friends," and "A college class." These proportions exceed 100% because the term may have been encountered in multiple media.

**Table 2.**

Proportion of Survey Responses to "Where Have You Heard of Integrated Pest Management?" from Participants Who Said They Had Heard of the Term

Media Type	Total Proportion (%) (n=47)
Other	40.4
Television	27.7
Newspaper	12.8
Leaflet	8.5
Gardening Supply Store	8.5
Internet	6.4
Gardening Workshop	6.4

Radio	4.3
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Before being read a definition of Integrated Pest Management, the participants were asked to describe what "Integrated Pest Management" or IPM meant to them. Three hundred and sixty-two respondents (30.1%) provided alternative definitions, while the remaining 842 (69.9%) declined to provide a response.

The alternative definitions were classified into the 10 categories shown in Table 3. The largest proportion of respondents defined the term as an integration of multiple methods or approaches to controlling pests. This category includes individuals in the group that thought the term implied a combination of toxic and non-toxic methods of pest control. The next largest proportion indicated that the term implied a non-toxic or environmentally friendly method of controlling pests. Fifty-eight persons thought the term implied some means of controlling pests, but did not give further explanation. Responses in this category include: "Pest control," "Methods to control pests," "Ways to manage pests," "A way of keeping bugs out." Fourteen respondents specified that the term implied alternatives to pesticides. Examples of such alternatives include "Having something built into the home," "Electronic pest devices," and "Alternative methods to control pests." The responses in this category made no explicit reference to adopting non-toxic or environmental-friendly alternatives to pest control. Very few respondents associated the term "Integrated pest management" with the use of chemicals to control pests.

**Table 3.**

Responses to the Question "What Does 'Integrated Pest Management' Mean to You?" Prior to Being Told a Definition of the Term

<b>Meaning</b>	<b>Count (%)</b>
Using a Combination of Methods to Control Pests	100 (27.6)
Use of Non-Toxic Methods to Control Pests	75 (20.7)
A Method of Pest Control ( <i>Not Otherwise Specified</i> )	58 (16.0)
A Company/ Product that Controls Pests	31 (8.6)
Alternative Ways of Controlling Pests ( <i>Not Otherwise Specified</i> )	25 (6.9)
Other	22 (6.1)
A Method of Pest Control That Works on All Pests	19 (5.2)
Minimizing/Controlling the Usage of Pesticides	14 (3.9)
A "System"/ "Plan" for Controlling Pests	

	10 (2.8)
Use of Chemicals to Control Pests	8 (2.2)
<b>Total</b>	362 (100.0)

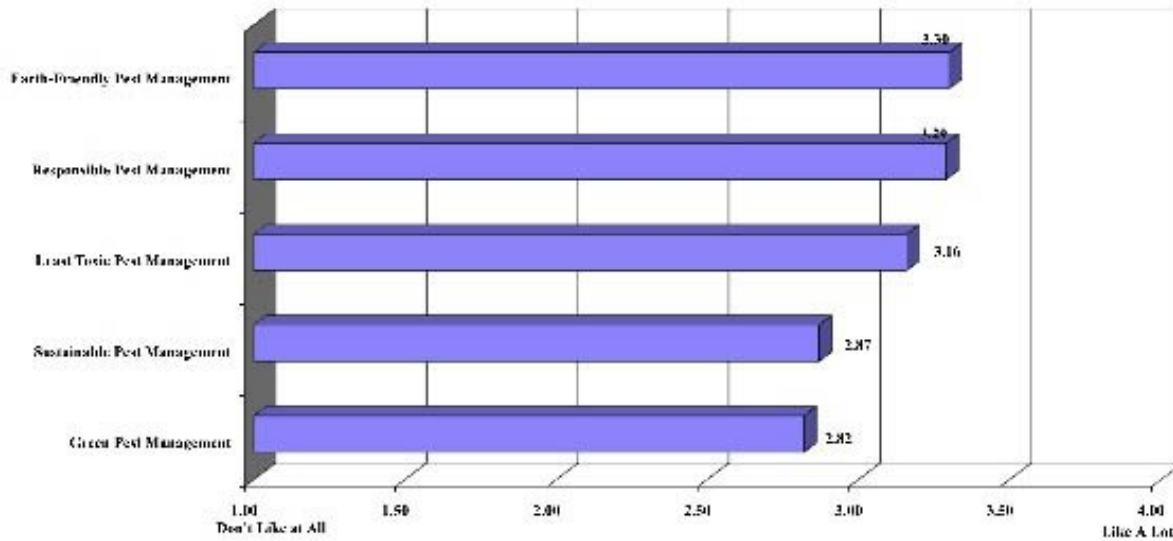
For the next step of the survey, interviewers read a definition of IPM to the participants: "Integrated Pest Management is a way to manage pests that focuses on long-term prevention by combining chemical and non-chemical approaches to minimize economic, health, and environmental risks." The participants were then asked to rate the extent to which they liked five alternative terms to convey this definition in public use. Ratings were obtained on a scale from one to four with one indicating, "Don't like at all," and four indicating "Like a lot." The five choices were:

- Responsible Pest Management
- Least Toxic Pest Management
- Earth-Friendly Pest Management
- Green Pest Management
- Sustainable Pest Management

As depicted in Figure 1, the term "Earth-Friendly Pest Management" was liked the most ( $M = 3.30$ ), followed by "Responsible Pest Management" ( $M = 3.29$ ). Although there were no significant differences among any of the choices ( $p > 0.005$ ), females were a little more likely to favor the term "Earth Friendly Pest Management" ( $M = 3.40$ ) than males ( $M = 3.18$ );  $F(1, 1077) = 12.61, p = .001$ . Caucasians also liked the term "Earth-Friendly Pest Management" ( $M = 3.40$ ) slightly more than Hispanics/ Latinos ( $M = 3.19$ );  $F(2, 992) = 8.00, p = .05$ . Respondents over the age of 65 preferred the term "Green Pest Management" ( $M = 2.62$ ) less than respondents between the ages of 35 and 64 ( $M = 2.92$ );  $F(3, 904) = 2.94, p = .05$ .

**Figure 1.**

Mean Preference for Alternative Terms to Describe Integrated Pest Management



Additionally, we asked respondents to recommend any additional terms that might be used to describe pest management strategies that minimize economic, health, and environmental risks. One hundred and five respondents suggested at least one term. Fourteen respondents specified two such terms, and three suggested three terms. Therefore, a total of 132 alternative terms were suggested. These were classified into eight general categories presented in Table 4.

The largest proportion of respondents recommended a term that implied environmental protection, such as "Environmentally Sensitive Pest Management," "Environmentally Friendly Pest Management," and "Eco-Friendly Pest Management." The next largest proportion preferred terms that made the non-toxic/organic nature of pest management more explicit. Thirteen respondents recommended terms that did not easily fit into the seven main categories and were classified as "Other" responses. These include, "Basic Remedies," "Compassionate Pest Management," "Flawless Pest Management," "Gentle," "Green Stay," and "Good Housekeeping." Because respondents specified multiple terms, the percentages in Table 4 sum to more than 100%.

**Table 4.**  
Classification of Other Terms That Could Be Used Instead of "Integrated Pest Management"

Term	Count (%)
Safe for the Environment Pest Management	33 (31.4)
Non-Toxic Organic Pest Management	29 (27.6)
Safe for Children/ Pets/ Families Pest Management	18 (17.1)
Other	13 (12.3)

Effective/ Reliable/ Long Lasting Pest Management	9 (8.5)
Wholesome/ Holistic Pest Management	7 (6.6)
Smart Pest Management	7 (6.6)
Safe Pest Management	6 (5.7)

## Conclusion

The purpose of this article is not to offer a new universal term for IPM but rather suggest that educators be more aware that the terminology used for agricultural clientele may not work for a non-agricultural audience. Educators should be more creative in using terminology that the audience can relate to if they want to promote the use of Integrated Pest Management. The term "Integrated Pest Management" or IPM was not part of the vocabulary of most adult residents in the survey areas. Less than one person in 20 was familiar with the term, and their exposure to it did not come from a single source. Our results show that people become familiar with the term through a variety of sources and that, therefore, a single method of information dissemination is not going to be effective in familiarizing people with the term and ultimately helping them understand what an IPM program entails.

Additionally, the alternative terms given by respondents suggest that a more effective term for IPM should have a more descriptive context and should reflect the expressed desire of many respondents not to harm the environment, people, or pets. We suggest that educators working with home gardeners or the public in general adopt terminology or even use a variety of definitions when describing IPM to package it in a form that is more suitable to their audience rather than trying to use terminology that their audience cannot associate with either the concept or description.

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