PERCEPTIONS OF NURSERY/PESTICIDE RETAILERS CONCERNING URBAN INTEGRATED PEST MANAGEMENT IN METROPOLITAN OKLAHOMA CITY

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CHAPTER I

INTRODUCTION

Since the mid 1940's, pest control practices have shifted from primarily biological and cultural control systems to chemical control measures (Huffaker, 1980). Increased public awareness of the hazards of chemical controls has prompted the need to develop pest control strategies which include alternatives to pesticides. The development and implementation of a combination of control measures is referred to as Integrated Pest Management (IPM). Historically, IPM programs have included primarily, a combination of biological and chemical control measures. Today IPM programs include not only biological and chemical control agents, but also cultural practices, resistant or tolerant species, and a host of other means aimed at controlling the target pest.

Integrated Pest Management programs have been successfully developed for many cropping systems. Emphasis on developing IPM programs for urban environs is relatively new. When households or commercial businesses are faced with pest control situations, the quickest solution, the use of pesticides, is often the only alternative considered. Such usage has often resulted in inefficient and ineffective

control and a number of human and environmental health problems.

Statement of the Problem

Surveys have indicated that over 90% of individual city households use pesticides. Most of these households obtain their management, chemical recommendations, and usage information from garden centers, nurseries, and retail chemical dealers (Bennett et al.,1983). Little information is available regarding the level of knowledge or specific training of the individuals supplying this type of information to the general public. The misuse of pesticides has often resulted in inefficient and ineffective control, and a number of human and environmental health problems.

Purpose of the Study

This study had a two-fold purpose; 1) determine the attitude of owner/managers of nursery/pesticide retail outlets toward participating as cooperators in an urban integrated pest management program, and 2) determine the sources of information used by owner/managers and salespersons of nursery/pesticide retailers in the areas of pest identification and pest control recommendations in the Oklahoma City metropolitan area.

Scope of the Study

An attempt was made to interview all of the nursery/pesticide retail businesses, meeting specific criteria, which were located in metropolitan Oklahoma City. The criteria established by the IPM Steering Committee for candidate businesses was that 50% of gross income be derived from the combined sale of growing plants and pesticides. Fifty businesses were identified as meeting this criteria. Additionally, two wholesale businesses were included in the study population due to their influence on the retail businesses interviewed. Five of the 52 businesses were found to be out of business at the time of the study. The total number of interviews attempted was 47.

Objectives of the Study

1. Identify demographic characteristics of nursery/pesticide retailers including, the percent of gross income derived from the following three categories; 1) pesticide sales, including fertilizer and weed and feed products, 2) plant sales, and 3) service related sales. Additionally, determine the highest education level completed by sales-persons interviewed, and sources of additional formal training completed by salespersons interviewed which aids them in making pest management recommendations.

2. Determine whether or not owner/managers provide training for employees in the areas of pest identification, pest control, and pesticide safety.

3. Determine knowledge areas perceived by owner/managers as those which employees could best benefit from additional training, and knowledge areas perceived by salespersons as those which would best benefit them.

4. Determine the percentage of both full time and part time (seasonal) employees who make pest control recommendations.

5. Determine the owner/managers' perceived percentage of pest control recommendations which do not include pesticides.

6. Determine the number of owner/managers and salespersons who have used various Cooperative Extension Service services including, the Plant Disease Diagnostic Laboratory, the free telephone Fone-Fax service, and the Soil Fertility Testing Laboratory, and their perceived satisfaction of the service received.

7. Determine the willingness of owner/managers to participate in programs sponsored by the Oklahoma State University Cooperative Extension Service.

8. Determine salespersons' perceptions of selected sales aids which could be provided by the Urban IPM program.

9. Determine the major reference materials to which salespersons have access.

10. Determine the sources of technical information used by owner/managers and salespersons when identifying pests and making pest control recommendations.

Definition of Terms

In order to aid the reader, the following terms are defined:

Fone-Fax: A free service provided by the Oklahoma State University Cooperative Extension Service to clientele in selected central Oklahoma counties. Clientele are provided with a list of numbered information areas and a telephone number which accesses short audio tape presentations of the desired topic.

Integrated Pest Management (IPM): A pest management system that in the context of the associated environment and the population dynamics of the pest species, utilizes all suitable techniques and methods in as compatible a manner as possible and maintains pest populations at levels below those causing economic injury.

Local On-site Field Day: A free service provided by the Oklahoma State University Cooperative Extension Service to retail nursery businesses. Cooperative Extension professionals, from various areas of specialty, are located at the business for several hours to answer questions from customers and employees.

Perception: A direct acquaintance with anything through the senses which indicates knowledge or understanding of objects recognized through those senses.

Pesticide: A chemical compound, solution, or mixture which when applied according to manufacturer's specifica-

tions, results in the reduction of a specific target organism population.

Plant Disease Diagnostic Laboratory: A fee based service provided by the Oklahoma State University Cooperative Extension Service to clientele statewide. Located in Stillwater, Oklahoma, and housed in the Department of Plant Pathology, this laboratory provides specific plant disease diagnostic services.

Soil Fertility Testing Laboratory: A fee based service provided by the Oklahoma State University Cooperative Extension Service to clientele statewide. Located in Stillwater, Oklahoma, and housed in the Department of Agronomy, this laboratory provides analysis of soil for nutrient content and fertility recommendations for cropping systems, based on the soil analysis.

Urban IPM Advisory Committee: A committee composed of a representative of the Oklahoma County Housing Authority, several owner/operators of nursery/garden centers and owner/operators of pest control companies, and representatives of Oklahoma State University. The committee is charged with guiding the Urban IPM Program and developing support with industry.

Urban IPM Steering Committee: A committee composed of Oklahoma State University personnel representing all departments. The committee responsibilities include, provide technical educational support, assist in program

development, and assist the local advisory committee as needed.

CHAPTER II

A REVIEW OF RELATED LITERATURE

The purpose of this chapter is to present a brief review of literature of the history of pest management concepts and specifically, the history of integrated pest management concepts in the areas of entomology, plant pathology, and weed science. Additional sections were included concerning urban IPM programs and possible consequences of relying solely on chemical pest controls in urban environs.

History of Pest Management Concepts

"The history of man is the record of a hungry creature in search of food ..." (Pfadt, 1971, p.1). Pests of mankind's food and fiber have played a major role in the historical development of the world. An example is the Irish potato famine of 1845 and 1846. Within five years of the outbreak of the disease, more than one and one-half million people emigrated to other parts of the world (Kenega, 1974). Historical pest control schemes consist primarily of physical measures. Physical pest control usually involves isolating the host species from the pest. In the case of insect problems, row covers are an effective

means of accomplishing physical control (Metcalf, 1982). Another mechanism of physical insect control is squashing unwanted bugs (i.e. fly swatter). Weed control may be considered physical when weeds are pulled manually from the area where the desired host is being grown. Physical control is not only the earliest control system, but one that is used often in modern times.

As humans became agricultural in nature, cultural pest control measures surfaced. These include plowing to prevent early weed development, reduce the development of plant diseases (Kenaga, 1974), and reduce soil borne insect damage. Also, the use of crop rotation as a pest management method, has been documented as early as the Egyptian era. One of the primary cultural control practices, still recommended today, is sanitation. Lack of cleanliness is a major factor in cockroach infestations occurring in urban housing developments (Robinson, 1985).

Biological pest control is also documented in historical works. Spiders, frogs, and toads have been used to aid in insect control (Pfadt, 1971). Unwanted birds were repelled by owl models and scarecrows.

More recently, legal control measures have been introduced. These include quarantines which attempt to physically limit the spread of pest organisms. As man has developed sophisticated methods of moving himself from place to place, he also moves pests. Historically, mountain ranges and oceans were effective barriers against the spread

of pests. Today, an undesirable insect or fungal spore may find luxury accommodations aboard any number of transoceanic flights.

Integrated Pest Management Concepts

Following WWII, chemical pest control grew steadily as not only an accepted practice, but a necessary aspect of our daily lives (Metcalf, 1982). This occurred not only on the farm, but also in cities, as pest control companies sprouted across the nation. Over indulgence in pest control chemicals led to environmental problems which, in turn, led to political pressures. Today, pest control chemicals, or pesticides, are used in nearly every aspect of our lives. A 1981 survey of pesticide applicators, funded by the Environmental Protection Agency, reported that a total of 47.1 million pounds of pesticides were used annually in urban areas (Brandt, 1981). Seventy-nine percent of this total were classed as insecticides. This study did not include over-the-counter sales of pesticides for application by the urban dweller.

In the early 1970's, the National Science Foundation and the Environmental Protection Agency jointly funded a national IPM program (Huffaker, 1980). While the initial emphasis of this project was agricultural, many of the concepts employed may be used in an urban IPM model. The concept of utilizing a number of different control practices, rather than relying on one practice such as

pesticides, to reach cost effective, safe, and reliable pest control may seem to be common sense. A survey of Berkeley, California residents indicated "that people with higher incomes had fewer 'pests,' used more insecticide and had different 'pests' than people with lower incomes" (Olkowski, 1977, p.2). Social pressures are a force which must be recognized and dealt with while developing an urban IPM program.

Pesticides in the Environment

Chemical pollution of the environment has become a topic of concern, and even disgust in American society. While the majority of pesticide use occurs in rural settings, the consequences of that use often occur in urban environs. To compound the problems associated with exposing concentrated populations to pesticide contamination, urban building projects are expanding into areas previously dominated by agricultural production. Often, large numbers of people live adjacent to fields being sprayed with agricultural chemicals at regular intervals throughout the growing season.

Urban dwellers apply large amounts of pesticide themselves in attempts to control both structural pests and pests of surrounding plantings (Brandt, 1985). Little is known of the knowledge level of those persons making applications of pesticides to their own property (Olkowski, 1977). Most experts agree that the average home owner has

little knowledge of the target pest, pesticide safety, or even the hazards involved to persons exposed directly to pesticide residues. A study of three urban areas, Philadelphia, Pennsylvania, Dallas, Texas, and Lansing, Michigan, indicated 92.5% of the respondents used insecticides in their homes and gardens (von Rumker et al., 1974). Few (8.5%) respondents indicated concern with the potential side effects of pesticide applications. Savage et al. (1979) reported that results from a national survey of over 8,000 respondents indicated that 90% of the respondents used pesticides in their homes and yards but 50% did not read the label.

Summary

While urban IPM programs are relatively new, the basic concept of minimizing, not eliminating, pesticide use is sound. The facts learned in field IPM programs can be modified to work in urban areas (Olkowski, 1977).

CHAPTER III

DESIGN AND METHODOLOGY

The purpose of this chapter is to explain the methods and procedures used in accomplishing the designated objectives. A survey instrument was designed in order to collect the necessary data. Due to the relatively small size of the target population, data were collected from each retail business which met criteria established by the Urban IPM steering committee.

The Population

Initially, names of retail businesses located in the Oklahoma City metropolitan area which sold both growing plants and pesticides were obtained from existing records located in the Oklahoma and Cleveland county Cooperative Extension offices. This list included over 400 businesses and included those which derived only a small percentage of their gross income from the sale of growing plants and pesticides. The urban IPM steering committee was interested in collecting data from businesses which could become more effective in plant and pesticide sales, from either receiving, or providing training in pest control recommendations, pesticide safety, and accurate pest

identification. Based on this criterion, the target population was defined as consisting of retail businesses which derived more than fifty percent of gross income from the combined sales of growing plants and pesticides. This population consisted of 52 nursery/pesticide retailers in the Oklahoma City metropolitan area. Five businesses were found to be out of business, leaving a total of 47. It should be noted that two large businesses were included which were primarily wholesale outlets. These businesses were considered to have an impact on the pesticides sold and pest control recommendations made by many of the study population businesses.

The Instrument

The initial step in developing an instrument to collect the needed data was to review survey instruments used in related studies. Since both owner/managers and salespersons were to be surveyed, two separate instruments were developed. From the review of related studies, it was determined that the personal interview and questionnaire methods would be appropriate. Accurate and spontaneous answers were required to obtain data relating to attitudes and perceptions. One disadvantage inherent to the mail questionnaire is lack of spontaneity of answers (Heath, 1985). Additionally, a more personal approach was desired in order to introduce potential cooperators to the urban IPM concept. Personal interviews would seem to be an ideal

vehicle to both collect data of a spontaneous nature, and include a personal approach. This method yields a high response rate with both accurate and spontaneous responses. Development of an interview guide was initiated and presented to the urban IPM steering committee. After consideration of phraseology, it was determined that bias induced by the interviewer, was a potential problem. This problem would distort information, particularly in the areas of establishing base-line knowledge levels.

The telephone interview method of collecting data provides the investigator with a vehicle to obtain spontaneous answers and minimize induced bias by the interviewer. Telephone interviews yield a high response rate, at a relatively low cost, in a short time span (Key, 1985).

Two telephone interview instruments were developed and approved by the urban IPM Steering Committee. One instrument was designed to collect information from owner/ managers, and the other to collect information from their respective salespersons. At the conclusion of the owner/ manager interview, a request was made to interview the salesperson most actively involved in making pest control recommendations to customers. Due to the small size of some businesses, the identified salesperson was sometimes the owner. These cases were noted, and the owner was interviewed as the salesperson.

Analysis of Data

The telephone survey involved questions which yielded data of a qualitative nature. Due to the small population size (47 businesses), and to maintain consistency in recording qualitative data, all interviews were conducted by the writer.

Owner/manager responses were itemized and summarized to indicate anticipated level of acceptance of an urban IPM program, and their perceived pest problems. Salesperson responses were treated similarly. Results were reported as totals and percentages.

CHAPTER IV

PRESENTATION OF DATA

Introduction

The purpose of the study was to determine the sources of information used by salespersons of nursery/pesticide retailers in the areas of pest identification, pesticide safety, and pest control recommendations, and determine the attitude of owner/managers of nursery/pesticide retail outlets toward participating as cooperators in an urban integrated pest management program in Oklahoma county, Oklahoma.

The objective of this chapter is to report the results of the surveys conducted of owner/managers and salespersons of nursery/pesticide retail businesses in the Oklahoma City metropolitan area as they pertain to the stated objectives of the study.

The Study Population

The study population consisted of 47 businesses in the Oklahoma City metropolitan area. The size of each company varied from a low of 2 employees (including the owner) to a high of more than 60 employees. The interview was preceded with a letter, mailed from the Oklahoma and Cleveland County

Cooperative Extension offices, to each company in the population, explaining the purpose of the upcoming interview and a request for participation. The survey was conducted during the months of January and February, 1987; a time determined to be relatively slow for this population. A summary of the population's response rate to the survey is reported in TABLE I. Thirty-seven (78.7%) of the businesses participated in the study and 10 (21.3%) chose not to participate.

TABLE I

RESPONSE RATE OF NURSERY/PESTICIDE RETAILERS IN THE OKLAHOMA CITY METROPOLITAN AREA

Population Size	Participants		Non-Participants	
	n	%	n	%
47	37	78.7	10	21.3

General Characteristics of Respondents

In an attempt to categorize the population, a question was asked which required owner/managers to estimate their percent of gross income derived from three specific areas. These areas were 1) sales of pesticides and fertilizers, including weed and feed products, 2) sales of growing plants, and 3) service related sales. Responses were as

follows; growing plant sales accounted for 46.1% of gross income, pesticide sales accounted for 23.1% of gross sales, and service related sales accounted for 14.6% of gross sales. One business did not sell any pesticides or fertilizer but specialized in biological control agents and organic soil amendments. Service related sales included pesticide application, plant placement, and other landscaping activities.

Owner/managers were asked if training was provided for employees in the areas of pest identification and control. Of the 37 responses, 26 (70%) respondents indicated that company sponsored training was provided to employees. Eleven (30%) respondents indicated that no training in the areas of pest identification and pest control was provided for employees.

Owner/managers were asked if training was provided for employees in the area of pesticide safety. Of the 37 respondents, 32 (87%) indicated that training was provided for employees by the company. No training, in the area of pesticide safety, was provided by 5 (13%) of the respondent companies.

To aid in the planning of training programs it was necessary to identify the formal educational level completed by the salespersons interviewed. The average educational grade completed by salespersons was 13.5. This number would be equivalent to a high school education plus 1 1/2 years of college. The average educational level of owner/managers

responding to this question was 14.4 years. This number is equivalent to a high school education plus 2 1/2 years of college.

Sources of training received by salespersons after completion of formal education included Vocational Technical school (19.4%), Cooperative Extension short courses (11.1%), and other sources (5.6%). The majority, 66.7%, of the salespersons interviewed had received no training after completing their formal education. Sources listed as other were not specified.

Responses Concerning Training Needs

Questions were asked of both population groups to determine the knowledge areas which could be emphasized in training programs to best benefit employees in performing their daily duties. The results of owner/manager and sales-person responses are detailed in TABLE II. Knowledge areas were identified by owner/managers as follows; 17 (44.7%) listed pesticide effectiveness, 12 (31.6%) indicated pest identification, 3 (7.9%) indicated other, 3 (7.9%) indicated none, 2 (5.3%) indicated plant disease concepts, and 1 (2.6%) indicated alternate control measures. Specific responses listed as other included pesticide regulations, applicator licensing, and customer relations. Results of knowledge areas identified by sales persons were, 15 (41.7%) listed pesticide effectiveness, 14 (38.8%) listed pest identification, 4 (11.1%) listed plant disease concepts, and

2 (5.6%) listed other. Responses listed as other were pesticide regulations and applicator licensing.

TABLE II

DISTRIBUTION OF KNOWLEDGE AREAS IDENTIFIED BY OWNER/MANAGERS AND SALESPERSONS FOR ADDITIONAL TRAINING

Knowledge Area	Distribution of Respondents	
	Owner/Manager Percent	Salesperson Percent
Pesticide Effectiveness	44.7	41.7
Pest Identification	31.6	38.8
Other	7.9	5.6
None	7.9	2.8
Plant Disease Concepts	5.3	11.1
Alternate Control Measures	2.6	0.0

Responses Concerning Pest Control Recommendations

To determine the percentage of employees who make pest control recommendations, the interviewer asked four questions; 1) how many of your full time employees make recommendations, 2) how many of your part time or seasonal employees make pest control recommendations, 3) how many full time persons do you employ, and 4) how many part time

or seasonal persons do you hire. The total number of full time persons employed by the 37 respondents was 320. Of these 320 employees, 51.3% (164) made pest control recommendations. Three hundred eighty-five seasonal persons were hired by the businesses interviewed. Of these 385 seasonal employees, 11.2% (43), made pest control recommendations.

To determine the extent to which pesticides were recommended as control measures, a question was asked of owner/managers. The wording was, "What percentage of your pest control recommendations do not include the use of insecticides, fungicides, or herbicides?" (APPENDIX A). This wording was intended to force the respondent to consider alternative control measures in the answer. The result was that 7.2% of the pest control recommendations did not include the use of pesticides.

Responses Concerning Use of Selected Cooperative Extension Services

Responses concerning the Plant Disease Diagnostic Laboratory varied between owner/managers and salespersons. Owner/manager responses indicated 19 (51.4%) had submitted samples to the lab, 14 (45.2%) had not submitted samples, and 4 (10.8%) were not aware of the Plant Disease Diagnostic Laboratory. Of those respondents who had utilized the laboratory, 14 (73.7%) were satisfied with the service received and 5 (26.3%) were dissatisfied with the service received. Reasons for dissatisfaction included slow turn

around time (3), response too complex (1), and response not detailed (1). Salesperson responses indicated 9 (25.0%) had submitted samples, 17 (47.2%) had not submitted samples, and 10 (27.8%) were not aware of the Plant Disease Diagnostic Laboratory. Of those salespersons responding that they had submitted samples, 7 (77.8%) indicated that they were satisfied with the service received and 2 (22.2%) were dissatisfied with the service received. Slow response time was the reason for dissatisfaction in both responses.

The Fone-Fax service was not commonly used by either population group. Owner/manager responses were as follows; 4 (12.5%) had used Fone-Fax, 18 (56.3%) had not used the service, and 10 (31.2%) were not aware of the Fone-Fax service. Salesperson responses were similar with 4 (14.3%) respondents having used the service, 14 (50%) had not used it, and 10 (35.7%) were not aware of the Fone-Fax service.

Owner/managers were not asked to respond to the question concerning use of the Soil Fertility Testing Laboratory. Salesperson responses indicated that 12 (33.3%) had used the laboratory, 23 (63.9%) had not used the service, and 1 (2.8%) was not aware of the Soil Fertility Testing Laboratory. Of the respondents who had used the laboratory, 11 (91.7%) were satisfied with the service received and 1 (8.3%) was not satisfied. The recorded reason for dissatisfaction was no response from the laboratory. The respondent did not send a second sample.

Responses Concerning Willingness To Participate in Programs

Owner/managers were asked to respond to two questions concerning their willingness to participate in programs sponsored by the Cooperative Extension Service. Results are reported in TABLE III. The first question asked if the respondents would participate in a local extension on-site field day conducted at the respondent's place of business (APPENDIX A). Recorded responses indicated 27 (73.0%) of the owner/managers would be willing to participate in the program and 10 (27.0%) would not be willing to participate. The second question asked if the respondents would be willing to participate in a training program provided by the Oklahoma State University Cooperative Extension Service (APPENDIX A). Twenty-nine (80.6%) respondents indicated that they would participate in the training program and 7 (19.4%) respondents indicated that they would not participate in the training program.

TABLE III

DISTRIBUTION OF OWNER/MANAGER RESPONDENTS CONCERNING WILLINGNESS TO PARTICIPATE IN PROGRAMS OFFERED BY THE OKLAHOMA STATE UNIVERSITY COOPERATIVE EXTENSION SERVICE

Program	Response	
	Yes (Percent)	No (Percent)
Local On-Site Field Day	73.0	27.0
Employee Training	80.6	19.4

Responses Concerning Usefulness of Sales Aids

A summary of the results of questioning salespersons concerning the usefulness of various sales aids is reported in TABLE IV.

TABLE IV

RATING OF VARIOUS SALES AIDS BY SALESPERSONS

Sales Aid	Rating		
	Very Useful	Useful	Not Useful
Handout material for customers to aid them with pest identification and control	32	1	1
A display of various pests and related control information	30	4	0
Reference guide of pesticides and pest control information	29	4	1
A toll free pest control and pesticide information hotline	25	9	2
Training workshops in pest identification	24	8	2
A toll free computer accessed Urban IPM help line	0	6	26

Responses Concerning Available Reference Materials and Information Sources

Major references available to salespersons included, the Ortho Problem Solver (47.8%), the County Agent's Handbook (30.4%), other (13.1%), and no reference material available (8.7%). Other references included various commercially available plant encyclopedias, Cooperative Extension Fact Sheets, and popular plant growth books.

Sources of technical information used by owner/managers and salespersons in the area of pest identification is reported in TABLE V. Sources for both populations were similar. Owner/managers' responses indicated that 38.8% used Cooperative Extension or university personnel, 34.0% used chemical company personnel or literature, 17.0% used Cooperative Extension literature, 6.4% used industry association materials, 2.1% used other state or federal agencies, and 2.1% used employees. Salesperson responses indicated that 34.9% used Cooperative Extension or university personnel, 32.6% used chemical company personnel or literature, 13.9% used Cooperative Extension literature, 11.6% used co-workers, 4.7% used industry association materials, and 2.3% used other state or federal agencies. It should be noted that some respondents selected more than one category.

TABLE V

SOURCES OF TECHNICAL INFORMATION USED BY OWNER/MANAGERS AND SALESPERSONS IN THE AREA OF PEST IDENTIFICATION

Source	Owner/Manager Percent	Salesperson Percent
Cooperative Extension or University Personnel	38.8	34.9
Chemical Company Personnel or Literature	34.0	32.6
Extension Literature	17.0	13.9
Industry Association Materials	6.4	4.7
Employees or Co-Workers	2.1	11.6
Other State or Federal Agencies	2.1	2.3

Sources of technical information used by owner/manager and salesperson in the area of pest control recommendations is reported in TABLE VI. Sources recorded for both populations were similar. Owner/managers' responses indicated that 50.0% used chemical company personnel or literature, 25.0% used Cooperative Extension or university personnel, 15.9% used Cooperative Extension literature, 4.5% used industry association materials, 2.3% used other business, and 2.3% used employees. Salesperson responses indicated that 50.0% used chemical company personnel or literature, 19.0% used Cooperative Extension or university personnel, 14.3% used Cooperative Extension literature,

11.9% used co-workers, 2.4% used industry association materials, and 2.4% used other businesses. It should be noted that some respondents selected more than one category.

TABLE VI

SOURCES OF TECHNICAL INFORMATION USED BY OWNER/MANAGERS AND SALESPERSONS IN THE AREA OF PEST CONTROL RECOMMENDATIONS

Source	Owner/Manager Percent	Salesperson Percent
Chemical Company Personnel or Literature	50.0	50.0
Cooperative Extension or University Personnel	25.0	19.0
Extension Literature	15.9	14.3
Industry Association Materials	4.5	2.4
Employees or Co-Workers	2.3	11.9
Other Businesses	2.3	2.4

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The intent of this chapter was to present summaries of the purpose and objectives of the study. Analysis of data collected yielded the following conclusions and recommendations.

Purpose of the Study

This study had a two-fold purpose; 1) determine the attitude of owner/managers of nursery/pesticide retail outlets toward participating as cooperators in an urban integrated pest management program , and 2) determine the sources of information used by owner/managers and salespersons of nursery/pesticide retailers in the areas of pest identification and pest control recommendations in the Oklahoma City metropolitan area.

Design of the Study

Following a review of literature and research related either directly or indirectly to the study, procedures were established to satisfy the purpose of the study. Specific objectives were outlined to enable the researcher to achieve

the stated purpose. The population was defined and a list of potential businesses was obtained from existing data housed in the Oklahoma and Cleveland County Cooperative Extension offices. This list consisted of more than 400 businesses. Many were excluded from the study population for various reasons. The initial list included large discount outlets, grocery stores, and seasonal businesses which were not considered potential cooperators in the Urban IPM program. After screening by the Urban IPM Steering Committee, the study population consisted of 52 businesses located in the Oklahoma City metropolitan area. Five of the 52 identified businesses were found to be out of business. The study population consisted of 47 nursery/pesticide outlets in metropolitan Oklahoma City.

Major Findings of the Study

General Characteristics of Respondents

To better understand the potential cooperators of the Urban IPM program, a question was asked which identified the average percent of gross income derived from three categories. These were; 1) monies received from the sale of growing plants, 2) monies received from the sale of pesticides and fertilizers, including weed and feed products, and 3) monies received from service related sales. The population average indicated that sales of growing plants accounted for the largest amount of monies received. Individual responses varied greatly, however, the majority

of respondents were primarily greenhouse or nursery businesses.

The majority of businesses reported that employee training of some type was provided. A larger number of businesses provided training in the area of pesticide safety than in the area of pest identification and control. All respondents which indicated that they provided training in pest identification and control, also indicated that they provided training in pesticide safety. Almost all training was conducted "in house". No respondents indicated that outside persons were hired to conduct training in these areas. Three of the five businesses which did not provide training for employees in the area of pesticide safety were small, consisting of either one person or a husband and wife only. One of these respondents did not sell any pesticides or commercial fertilizers. Two of the businesses which did not provide training in the area of pesticide safety were large (greater than 20 employees) but had only 1-3 employees who sold pesticides.

A fairly high level of education had been completed by those salespersons interviewed. All respondents had completed high school and one respondent held a masters degree. It should be noted that in some instances, the questions asked of salespersons were answered by owner/ managers. This occurred primarily in small businesses where the owner also served as the salesperson most actively involved in making pest management recommendations. In the

area of formal education completed, those owner/managers responding had completed an average of 14.4 years while employees responding to this question had completed an average of 13.5 years.

The majority of respondents (66.7%) had not received additional training after completing their formal education. It should be noted that on the job training was not considered as additional training.

Additional Training Needs

One objective of the Urban IPM program was to assist businesses in the area of training employees. Two major knowledge areas were identified by this study as areas of importance for further training. Those two areas were pesticide effectiveness and pest identification. The area of plant disease concepts was identified by salespersons as another area of some importance for further training.

Pest Control Recommendations

The majority of full time employees, 164 of 320 (51.3%), made pest control recommendations while fewer part time or seasonal employees, 43 of 385 (11.2%), made control recommendations. Of the pest control recommendations made, 7.2% did not include the use of pesticides. The wording of this question, "What percentage of your pest control recommendations do not include the use of insecticides,

control measures other than pesticides, prior to answering.

Use of Selected Cooperative Extension Services

Three questions were used to determine the awareness and utilization of 3 Cooperative Extension services. The three services were; 1) the Plant Disease Diagnostic Laboratory, 2) the Soil Fertility Testing Laboratory, and 3) the Fone-Fax service. Those respondents indicating that they had used the Plant Disease Diagnostic Laboratory and the Soil Fertility Testing Laboratory were asked whether or not they were satisfied with the service. The majority of those using these services, 75.0% (Plant Disease Diagnostic Laboratory) and 91.7% (Soil Fertiltiy Testing Laboratory), were satisfied. Awareness level for the Plant Disease Diagnostic Laboratory was lower for salespersons than for owners.

The Fone-Fax service had received little use, however, this service is designed for individual more than for commercial use. Approximately one-third of the respondents were not aware of the Fone-Fax service.

Willingness to Participate in Extension Programs

Respondents' willingness to participate in a local on-site field day was high (73%). Several respondents indicated that they had participated in the past in these

field days and would do so again. Those responding with no (27%), were not asked for specific reasons for their refusal, however, two volunteered reasons. They were; 1) "We know more than extension people", and 2) "I don't have time".

The percentage of respondents willing to participate in a training program provided by the Cooperative Extension Service was slightly higher. Eighty percent of the respondents indicated they would participate. No negative comments were recorded for this question.

Comparative Usefulness of Sales Aids

The interviewer read 6 items which could be provided by the Cooperative Extension Service and asked the salesperson to identify each item as being "very useful", "useful", or "not useful". Five items were found to be "very useful" while one item was found to be "not useful". The item found to be "not useful" was a computer accessed urban IPM help line. Most salespersons indicated that they did not have access to a computer. Owner/managers were asked if the company owned either a mini or micro computer. Thirty-five percent of the interviewed companies owned at least one computer. None of the respondents indicated that the computer accessed help line would be "very useful". The sales aids rated as "very useful" were; 1) a reference guide of pesticides and pest control information, 2) handout

material for customers that would aid them with their pest control and pesticide questions, 3) a display of various pests and related control information, 4) training workshops for salespersons in pest identification, and 5) a toll free pest control and pesticide information hot line.

Available Reference Materials

Salespersons were asked to name reference materials used to answer questions concerning pest identification and pest control recommendations. The Ortho Problem Solver was named most often (47.8%). The Cooperative Extension Service County Agent's Handbook was named by 30.4% of the respondents. Several respondents (13.1%) indicated that no references were available. Other named references represented 8.7% of the responses. Several respondents named more than one reference.

Sources of Technical Information

Sources of technical information listed by respondents was listed in two categories: 1) pest identification, and 2) pest control recommendations. Respondents listed Cooperative Extension or university personnel and chemical company personnel as most used sources of information for pest identification problems. Cooperative Extension literature was listed as another frequently used source for pest identification. Salespersons listed other employees or co-workers as an important source of information in this

category.

Chemical company personnel were listed as the most frequently used source for pest control recommendations. Extension personnel and literature ranked second and third in this category. Salespersons listed other employees and co-workers as an important source of information for pest control recommendations.

Conclusions

The analysis and interpretation of the data collected led to the following conclusions:

1. Most nursery/pesticide businesses conducted or provided training for employees in the areas of pesticide safety, pest identification, and pest control recommendations. It was further concluded that this training was conducted by company personnel on an "in house" basis.

2. Knowledge areas identified as important for additional training were pesticide effectiveness and pest identification. The educational level completed by owners and employees of businesses interviewed indicates that the persons could be receptive to further educational experiences.

3. A large percentage of current pest control recommendations include the use of pesticides.

4. Based on data collected, most businesses surveyed would participate as cooperators in an Urban Integrated Pest

Management program.

5. Cooperative Extension, university, and chemical company personnel influence decisions concerning pest identification and pest control.

Recommendations

As a result of the data analyzed and the conclusions drawn, the following recommendations are made:

1. The Cooperative Extension Service should proceed with the Urban IPM program, utilizing the nursery/pesticide retailers as cooperators, to maximize the effectiveness of those pest control measures deemed necessary.

2. Cooperative training should be developed by the Urban IPM committee which focuses on pesticide effectiveness, pest identification, and plant disease concepts.

3. Although only a small percentage of those businesses interviewed were negative, an attempt to improve relations between the Oklahoma State University Cooperative Extension Service and nursery/pesticide retailers should be implemented.

Recommendations for Further Research

The following recommendations are made regarding further research. The recommendations are made based upon findings made during the completion of the reported study.

1. A survey of consumers in the Oklahoma City metropolitan area should be conducted to learn the impact

the nursery/pesticide retailers have on pest management decisions made at the consumer level.

2. A study, conducted in the Oklahoma City metropolitan area, similar to the one completed, should be conducted in the future in order to allow the Urban Integrated Pest Management program to be evaluated, and the impact of the program measured.

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APPENDIX

URBAN IPM NURSERY/PESTICIDE RETAILER
OWNER/MANAGER SURVEY
WINTER 1987

Business name:
Telephone:
Title:
Name:

The individual results of this survey will be confidential. Would you be willing to participate in this survey by spending the next few minutes answering some questions about your business?

1. Do you presently provide training for your employees in the area of pest identification and control?

   Yes _____ No _____

2. (If #1 is Yes) What type of training?

3. Do you presently provide training for your employees in the area of pesticide safety?

   Yes _____ No _____

4. (If #3 is Yes) What type of training?

5. Would you be willing to participate in a training program, provided by the OSU Cooperative Extension Urban IPM program?

   Yes _____ No _____

6. How many of your full time employees make pest control recommendations?

   _____

7. How many of your part time, or seasonal employees make pest control recommendations?

   _____

8. From what sources do you obtain technical information concerning pest identification? (DO NOT PROMPT)

_____ Employees
_____ Extension or University Personnel
_____ Extension Literature
_____ Chemical Company Personnel and/or Literature
_____ Industry Association Materials
_____ Other Educational Material
_____ Other State or Federal Agency _____
_____ Other Business
_____ Private Consultant

9. From what sources do you obtain technical information concerning pest control recommendations? (DO NOT PROMPT)

_____ Employees
_____ Extension or University Personnel
_____ Extension Literature
_____ Chemical Company Personnel and/or Literature
_____ Industry Association Materials
_____ Other Educational Material
_____ Other State or Federal Agency _____
_____ Other Business
_____ Private Consultant

10. Have you ever submitted samples to the OSU Plant Disease Diagnostic Lab?

Yes _____ No _____ Not Aware _____

11. (If #10 is Yes) Were you satisfied with the service you received?

Yes _____ No _____

(If No) Why not?

12. Have you ever used the free telephone Fone-Fax service?

Yes _____ No _____ Not Aware _____

13. (If #12 is No) Would you like to receive information about Fone-Fax?

Yes _____ No _____

14. Would you participate in a local extension on-site field day conducted at your business?

Yes _____ No _____

15. What percentage of your pest control recommendations do not include the use of insecticides, fungicides, or herbicides? (insect killers, weed killers, etc.)

_____%

16. In what area do you feel your employees could best benefit from additional training? (ie. pesticide effectiveness, pest ID, plant disease concepts, control measures utilizing alternatives to pesticides, etc.)

17. Does your company own either a mini or micro computer?

Yes _____ No _____

18. Computer make _____

19. Computer model _____

The following questions concern the size of your business.

20. How long have you been in this type of business? _____

21. How many full time persons do you employ? _____

22. How many seasonal, or part time persons do you employ?

_____

23. Of your gross income, what percentage is derived from retail chemical sales, including fertilizers, and weed and feed products.

_____%

24. Of your gross income, what percentage is derived from retail plant sales?

_____%

25. Of your gross income, what percentage is derived from service related sales (ie. plant placement, chemical application, etc.)?

_____%

With your permission I would like to interview the employee who you consider the most knowledgeable in the area of pest identification and pest control.

Employee name:

Convenient Time:

Convenient Date:

URBAN IPM NURSERY/PESTICIDE RETAILER
SALESPERSON SURVEY
WINTER 1987

Business name:
Telephone:
Title:
Name:

1. How long have you been employed by this company? _____

2. What is the highest educational grade you completed?

   _____

3. Briefly describe any formal training you have received which helps you in your daily job. (ie. extension short courses, field days, formal class work, company sponsored training, etc.)

4. From what sources do you obtain technical information concerning pest identification? (DO NOT PROMPT)

   _____ Co-workers
   _____ Extension or University Personnel
   _____ Extension Literature
   _____ Chemical Company Personnel and/or Literature
   _____ Industry Association Materials
   _____ Other Educational Material
   _____ Other State or Federal Agency _____
   _____ Other Business
   _____ Private Consultant

5. From what sources do you obtain technical information concerning pest control recommendations? (DO NOT PROMPT)

_____ Co-workers
_____ Extension or University Personnel
_____ Extension Literature
_____ Chemical Company Personnel and/or Literature
_____ Industry Association Materials
_____ Other Educational Material
_____ Other State or Federal Agency _____
_____ Other Business
_____ Private Consultant

6. Have you ever submitted samples to the OSU Plant Disease Diagnostic Lab?

Yes _____ No _____ Not Aware _____

7. (If #6 is Yes) Were you satisfied with the service you received?

Yes _____ No _____

(If No) Why not?

8. Have you ever submitted samples to the OSU Soil Fertility Lab?

Yes _____ No _____ Not Aware _____

9. (If #8 is Yes) Were you satisfied with the service you received?

Yes _____ No _____

(If No) Why not?

10. Have you ever used the free telephone Fone-Fax service?

Yes _____ No _____ Not Aware _____

11. (If #10 is No) Would you like to receive information about Fone-Fax?

Yes _____ No _____

12. What pest management practices do you commonly recommend other than insecticides, fungicides, or herbicides? (DO NOT PROMPT)

** I will read a list of items which could possibly assist you in serving your customers. For each item, indicate whether the item would be very useful, useful, or not useful to you.

1=Very Useful 2=Useful 3=Not Useful

___ 13. Reference guide of pesticides and pest control information.

___ 14. Handout material for your customers that would aid them with their pest control and pesticide questions.

___ 15. A display of various pests and related control information.

___ 16. Training workshops for you in pest identification.

___ 17. A toll free pest control and pesticide information hot line.

___ 18. A toll free computer accessed Urban IPM help line.

19. What major reference materials do you have available concerning pest identification and pest control recommendations?

20. In what area do you feel you could best benefit from additional training? (ie. pesticide effectiveness, pest ID, plant disease concepts, control measures utilizing alternatives to pesticides, etc.)

VITA

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Candidate for the Degree of

Master of Science

Thesis: PERCEPTIONS OF NURSERY/PESTICIDE RETAILERS CONCERNING URBAN INTEGRATED PEST MANAGENEMT IN METROPOLITAN OKALHOMA CITY

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