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Holistic Pest Management Program for Master Gardener Volunteers

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Holistic Pest Management Program for Master Gardener Volunteers

Abstract

There is a growing interest among Master Gardener volunteers in the use of sustainable and non-chemical solutions for pest control. A holistic pest management program was designed to provide unbiased, research-based information and resources that would support the educational efforts of Extension and these volunteers. The results of pre- and post-survey instruments, completed by 54 volunteer participants, identified knowledge and attitude changes, as well as instructional areas needing modification. The framework of this program has allowed for replacing emotion with science and offers flexibility for adapting the program to suit the audience.

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Introduction

Most County Extension Offices receive large numbers of requests for information and assistance in resolving home and farm horticultural problems. One southern Ohio county, Athens, has recorded more than 2,000 requests per year, with many seeking organic solutions to their problem. Answers provided to clientele include cultural practices, the importance of positive identification of the problem, and organic recommendations with a least toxic chemical option if warranted. With the introduction of the Athens County Master Gardener program in 1997, it became clear that instruction in comprehensive pest management programs for volunteers was essential.

Background

Interest in the use of sustainable practices for farm, landscape, and home pest control continues to increase. The use of chemical control options can be an emotional issue, and the lack of unbiased, scientific research supporting non-chemical or holistic pest control solutions can prevent the adoption of integrated pest management practices that include the selection of least toxic compounds and potential organic options.

The use of a planned holistic pest management program that considers the environmental impact of all courses of action is foreign to many people. The control method frequently chosen can be more environmentally damaging than the use of a scientifically based, chemical control measure. This lack of knowledge and existing attitudes in the pest control equation led to the development a viable holistic pest control program that provides a systematic approach to pest control practices with resources and a framework that can be adapted to clientele with varying backgrounds and interests.

Method

Ohio State University Extension publishes numerous publications that provide information on controlling pests. Over 350 Home, Yard and Garden Fact Sheets are available to address specific issues related to fruit, vegetables, lawn, ornamentals, insects, and diseases. All of these publications are available at <http://ohioline.osu.edu>.

A search of available resources identified *Controlling Crop Pests and Diseases*, (Rappaport, 1993) as a source for the framework to design a program addressing cultural, organic, and chemical solutions relevant to temperate and tropical regions. Other publications incorporated into the curriculum were *Common-Sense Pest Control* (Olkowski, Daar, & Olkowski, 1995), *Natural Enemies of Vegetable Insect Pests* (Hoffman & Frodsham, Cornell Cooperative Extension, 1993) and *Integrated Pest Management Recommendations for Commercial Vegetable Production* (Cornell Cooperative Extension Publication, 1999). These books provide comprehensive information on natural pest control, integrated pest management, beneficial organisms, and pests in the home and garden.

Another component needed to complete this program was a source of unbiased information on the potential toxic effects of pesticides on humans and wildlife, their persistence, and potential for future problems. The source utilized was *Extoxnet* (Seyley, Rutz, Allan, & Kamrin, 1994), a project of Cornell Cooperative Extension, Michigan State University, Oregon State University, and University of California at Davis. This publication consists of Pesticide Information Profiles (two to five pages) of each pesticide's toxic effects and their expected actions in the environment.

The core program was developed to address three specific pests: insects, diseases, and weeds. Pest identification, damage, and life cycles are the first topics addressed in the curriculum. Basic cultural practices and organic and least toxic chemical options are subsequent topics covered. From this framework, programs have been adapted to various audiences by utilizing examples that are familiar to that specific group.

Results

To improve the effectiveness of the program, surveys of satisfaction and end of meeting evaluations were used. With the demonstrated success of the Master Gardener program as a viable outreach tool for Extension, a more formal evaluation, assessing the change in participants' knowledge and attitudes was needed to assure desired outcomes.

A pre- and post-test instrument was developed, with the results used to measure these changes and make modifications in the curriculum. The tool was tested for reliability and validity in 1997 with groups of Master Gardener participants and peers. Subsequent to this testing, it was administered to four groups (N=54) with various backgrounds beginning in 1998. This instrument is presented in Figure 1.

Figure 1.

Pre- and Post-Test Instrument Administered to Master Gardener Participants

Instructions: Rate each of the following. If one or more of the answers are not an option, do not fill in the blank. If you use an option not listed, write it down in "other" and rate it with the rest.

- 1. When several unfamiliar insects are found on a tomato plant, what would be your normal sequence of insect control? (Rate in order from most likely (1) to least likely (up to 7)).**
 hand pick
 use a commercial insecticide
 remove plant
 get a positive I.D. (From book, expert, etc.)
 use alternative product (Soap, alcohol, etc.)
 remember the problem and try preventative measures next year
 other _____
- 2. When several unfamiliar insects are found on an outdoor perennial flower, what would be your normal sequence of insect control? (Rate in order from most likely (1) to least likely (up to 7)).**
 hand pick
 use a commercial insecticide
 remove plant
 get a positive I.D. (From book, expert, etc.)
 use alternative product (Soap, alcohol, etc.)
 remember the problem and try preventative measures next year
 other _____
- 3. When purchasing an insecticide, you base your decision on...(Rate from 1 meaning most likely up to 5 meaning least likely).**
 recommendation from expert sources (please describe source _____)

- toxicity
- price
- what worked in the past
- other _____

4. Which is more toxic? (Rate from most toxic (1) to least toxic (3)).
- Malathion
 - Sevin Rotenone
5. If you have a disease starting on a tomato plant, what is the sequence of what you are most likely to do? (Rate in order from most likely (1) to least likely (up to 7)).
- prune or cut out
 - plant resistant varieties next year if available
 - get a positive I.D. (From book, expert, etc.)
 - spray with a fungicide like a lime/sulfur/copper spray
 - spray with a fungicide like Captan
 - remember to rotate next year
 - other _____
6. If you have a disease starting on an ornamental tree (i.e. flowering crabapple) what is the sequence of what you are most likely to do? (Rate in order from most likely (1) to least likely (up to 7)).
- prune or cut out
 - plant resistant varieties next year if available
 - get a positive I.D. (From book, expert, etc.)
 - spray with a fungicide like a lime/sulfur/copper spray
 - spray with a fungicide like Captan
 - clean up all debris each autumn
 - other _____

Results from 4 years of this survey demonstrate participants' knowledge and attitude change. For example, more participants (67%) ranked positive identification of the problem as their first step in a control program on the post-test compared to pre-test (56%) responses. Similarly, following instruction, 87% recognized the value of basing insecticide purchases on expert recommendations and product toxicity compared to 80% before, while only 13% of post-test respondents would base purchase decisions on what worked in the past compared to 21% of pre-test respondents.

Conclusions

Extension's stated mission is to provide research-based information that can have a positive impact on the lives of our clientele. In some cases, scientific evidence has not been present to address emotional issues such as this and be accepted by a broad range of consumers. Holistic pest management programs have been taught more than 20 times since mid 1998 to commercial producers, landscape and turf specialists, industry specialists, college classes, civic organizations, garden clubs, and Master Gardeners. Adoption of this framework has replaced emotion with scientific, researched-based information and allows flexibility to adapt the program to different audiences with a wide range of convictions in most geographical locations.

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