



Figure 1. CD-ROM users can access information about management practices for individual pests.

Interactive, Computer-Assisted Pest Management Training for Retail Nursery Clerks and Master Gardeners

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Retail nursery personnel, horticultural advisors, and Master Gardeners serve as the primary sources of pest management information for home gardeners. Currently, Master Gardeners are trained in large lecture-style classes for a few hours. Although some retail nursery personnel are very knowledgeable about pest problems and solutions, most have little training in pest management, and retail nurseries cannot afford to provide extensive training to their staff. There is need for better training of all of these information disseminators to assure a high standard of quality for home garden information.

Goals and Objectives

The focus of our project was the development of an interactive training CD-ROM for retail nursery personnel, Master Gardeners, and horticultural advisors. The primary objective was to create a system which would instruct users in diagnosing pest problems and making recommendations that provide the least toxic pest management alternatives that can reduce the use of pesticides in the urban environment. We set out to design this system in order to provide users quick access to high quality, peer-reviewed, environmentally sound information and to improve their responses to pest management questions. The training program will offer a relatively low-cost and efficient way to train a large population of pest management disseminators in fundamental IPM techniques for the home garden.

Discussion

Development and Accomplishments July 1998-June 1999. The first step in the development of the interactive training tool was to examine the structural and graphic needs of the project and choose an

authoring system. The training system is being developed in a CD-ROM format so that it can be readily used on all newer computers without requiring an Internet connection. We used Authorware by Macromedia to develop the training program because it readily accommodates graphics and text presentation, interactive testing, scoring, and other kinds of feedback. It is flexible and allows complex interactions among program elements. Development of this project began on the Macintosh platform, although the resulting program would be for both the Macintosh and PC. However, during the project, Macromedia stopped providing technical support on the version of Authorware we were using, forcing us to move to a new version produced solely for the PC.

We have developed part of an interactive training system designed specifically to train individual retail nursery staff and Master Gardeners to answer questions related to common garden and landscape problems. Early in the project the production team met to discuss user needs and develop basic format and design. Plans for modules on snails and slugs, ants, borers, lawn insects, root problems, vascular problems, virus diseases, and environmental disorders were planned, since these pests represent the largest part of the garden questions asked.

The design of individual modules is based on a main menu from which the user can view presentations about pest identification, life cycle and seasonal development, damage, and management practices. The presentations make extensive use of photos and line drawings, and in some cases video clips. Sound is incorporated into the presentations to point out key features in illustrations or to highlight particularly important points. From the main menu, users also can select the "test your knowledge" sections and answer true-false; multiple choice; matching; or interactive, game-like "complete the diagram" questions that require understanding of the materials presented. Each test gives the user a chance to return to the relevant sections of the presentation when help is needed to answer a question, or when the answer given is incorrect.

Slugs and snails were the subject of the first module (Figure 1). To develop the module, we had to identify appropriate photographs and line drawings and write the module text. Programming to facilitate the flow and interrelationships between various pieces has also been completed. Dozens of potential users have reviewed the module and provided feedback on improvements. The module has also been demonstrated to

several Master Gardener groups. Comments received are being applied to other modules as appropriate.

The Slosson Foundation provided partial funding for a related project in 1995-96 and 1996-97. That project developed a comprehensive CD-ROM resource for diagnosis and management of vegetable, fruit tree, and ornamental pests and problems on which this training module was to be based. We had originally intended to reconfigure much of the information in the comprehensive CD-ROM into this training system. However, as potential users began to test this new system, we realized that adaptation was not going to be as simple as originally anticipated. Users and reviewers brought to our attention the great need for more detailed photos and line drawings as well as the need for high quality video clips to train users most effectively. Management sections needed to be researched more thoroughly to include greater depth of information on pesticide application, hazards, and potential problems to non-target organisms than had been included in the reference. We also needed to research the types of questions Master Gardeners and retail nursery personnel were getting from homeowners. In order to satisfy the demands of the user while at the same time creating a high quality professional product which is also attractive and fun to use, we needed to create an entirely new product.

A focus group consisting of retail nursery workers, consultants, managers and several Master Gardeners was developed to help us determine what kinds of things Master Gardeners and retail nursery personnel need to know to effectively satisfy a client's inquiry. This group is currently providing feedback on the quiz sections of our modules on ants and borers. Two of the most commonly used insecticides in home gardens and landscapes, diazinon and chlorpyrifos, are used for ant and borer control and have recently been found contaminating surface water due to drainage from urban areas. It is our goal to provide users with reliable information about alternatives to these pesticides. We want users to be able to learn how to enhance control by combining multiple control tactics, while decreasing the amount of pesticides applied. This feedback is being incorporated into new sections of the CD-ROM. Modules on lawn insects and biological control are also underway.

Future plans and expected outcomes. Although we have had a few setbacks while developing the interactive CD-ROM, we are committed to completing 12 interactive tutorial modules as promised in our original

proposal. In addition to the modules focusing on specific groups of pests, we are developing others that concentrate on promoting integrated pest management in the home garden and landscape. One module is devoted to weed management while another focuses on biological control, making users aware of the predators, parasites, and pathogens that can help reduce damage and control pests. Because home owners most commonly rely on pesticides to control pests, another module will be directed at pesticide safety.

Once the training modules are completed and thoroughly tested and reviewed, we anticipate a major extension effort to promote their use by retail nurseries, Master Gardener programs and others. This would include using them for stand-alone training or as components of a multifaceted instructional program. We expect the interactive training system to be an efficient way to train new retail nursery employees and Master Gardeners. The program will vastly improve the ability of retail nursery employees and Master Gardeners to answer horticultural questions from its rapidly increasing urban/suburban gardening clientele. The program will provide the user with a solid foundation of the principles of pest management, equipping them with the knowledge to diagnose basic plant problems and to

supply adequate management solutions to home gardening problems.

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