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Final report to the Elvenia J. Slosson Endowment Fund for work performed from July 1, 2004 – June 30, 2005

Title:

Comprehensive web-based guide for garden and landscape pests

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INTRODUCTION

In 2000, The UC IPM Program released a comprehensive garden and landscape reference on CD-ROM, the UC Guide to Solving Garden and Landscape Problems. This reference guide contains pest identification and management information for more than 600 pests and disorders on 83 woody ornamental plant species, 23 vegetables, and 17 fruit trees. It has been widely used by UCCE Master Gardeners throughout California and has sold nearly 2000 copies through ANR Communication Services. It is currently almost out of print and much of the pesticide information recommended is now out of date. It needs to be updated. Instead of creating a new CD-ROM, we felt more people would benefit from the information if it were converted to a web format. Additionally, web content is easier to update than information on a CD-ROM. We have spent the past year taking the content and photographs from the CD-ROM and converting them to web format. We will end up with a database of almost 5 times the number of pests currently covered on the UC IPM web site.

GOALS / OBJECTIVES

The goal of this project was to create a database of pest management information on the UC IPM web site using the information from the UC Guide to Solving Garden and Landscape Problems CD-ROM. The UC IPM web site currently has a Pest Notes series, which serves as the primary source of pest management information for home gardeners and landscapers. There are nearly 125 garden and landscape pests covered in this short answer publication series, and they are organized by pest name. However, it would be more useful in pest diagnosis if they were organized by host plant as well. This project

would incorporate the format of the UC Guide so that users could find pests by going in through the host plant. It would also expand the number of pests covered to nearly 600.

DISCUSSION

Organization

We went through all of the 850 files in the UC Guide to Solving Garden and Landscape Problems to decide which ones would be converted to web format and which ones could be deleted. We deleted screens of pests that are already covered in the Pest Notes, as the web version will link directly to Pest Notes. Pests found only in the Pacific Northwest were also deleted. There was no need to convert the section on weeds; we could use the weed gallery pages already on the web. Many menu screens were also deleted. New menu screens needed to be developed to fit in with the format on the web.

Developing the screens for the web

The UC Guide to Solving Garden and Landscape Problems was originally created using the software Authorware, made by Macromedia. We are using the software Dreamweaver to design and program the web screens. Unfortunately, there was no simple way of converting the screens from Authorware to Dreamweaver. Each Authorware file had to be opened. The content was selected and copied and then pasted into a Dreamweaver screen. The photographs were copied from the original Authorware files and then copied and pasted into PhotoShop, given a file name, and then linked into the new web page.

We had organized the UC Guide to Solving Garden and Landscape Problems by pests and disorders on vegetables, on fruit trees, and on ornamental trees and shrubs. We worked on the ornamental section first. We made web templates for plant menu screens, pest and disorder screens, and screens for life cycles, pesticides, and general management practices.

We started with the plant menu screens. These 62 screens list pest and disorders for 83 ornamental tree and shrub species. Each screen also has a photo of the plant and information on plant identification and optimum conditions for growth (See Figure 1). For each plant screen, we made lists of the pest and disorder screens that would need to be created. We noted if we had a Pest Note that could be linked instead. Then we started converting the pest and disorder screens. We started by creating all of the main pest pages. Each main screen contains a photo, information on identification and damage or symptoms, and solutions for management (See Figure 2). After the main screens were finished, we completed the information for each pest or disorder with identification pages, life cycles, and management pages where needed. Pesticide screens were also redone.

After the ornamental plant and pest screens were completed, we followed the same process for converting the screens from the vegetable section of the UC Guide to the web. Then we began working on the screens from the fruit tree section.

Reviewing screens on web

After each screen was converted to web format, the Dreamweaver file was printed out and compared side-by-side with the Authorware version of the UC Guide. All edits were incorporated.

When all of the ornamental plant and pest screens had been completed, they were loaded onto the test area of the UC IPM web site where links from plant screens to pest screens or to Pest Notes were created. Links within pest screens to management information were also established.

Parts of the ornamental section were presented at a Master Gardener training session in June 2005.

Continuing work

The links in the ornamental section are currently being completed. These links are all being checked for accuracy before this section is released to the public. The pesticide information and management information also needs to be double checked for accuracy before it goes up on the web. We expect the ornamental section to be released to the public within the next couple of months.

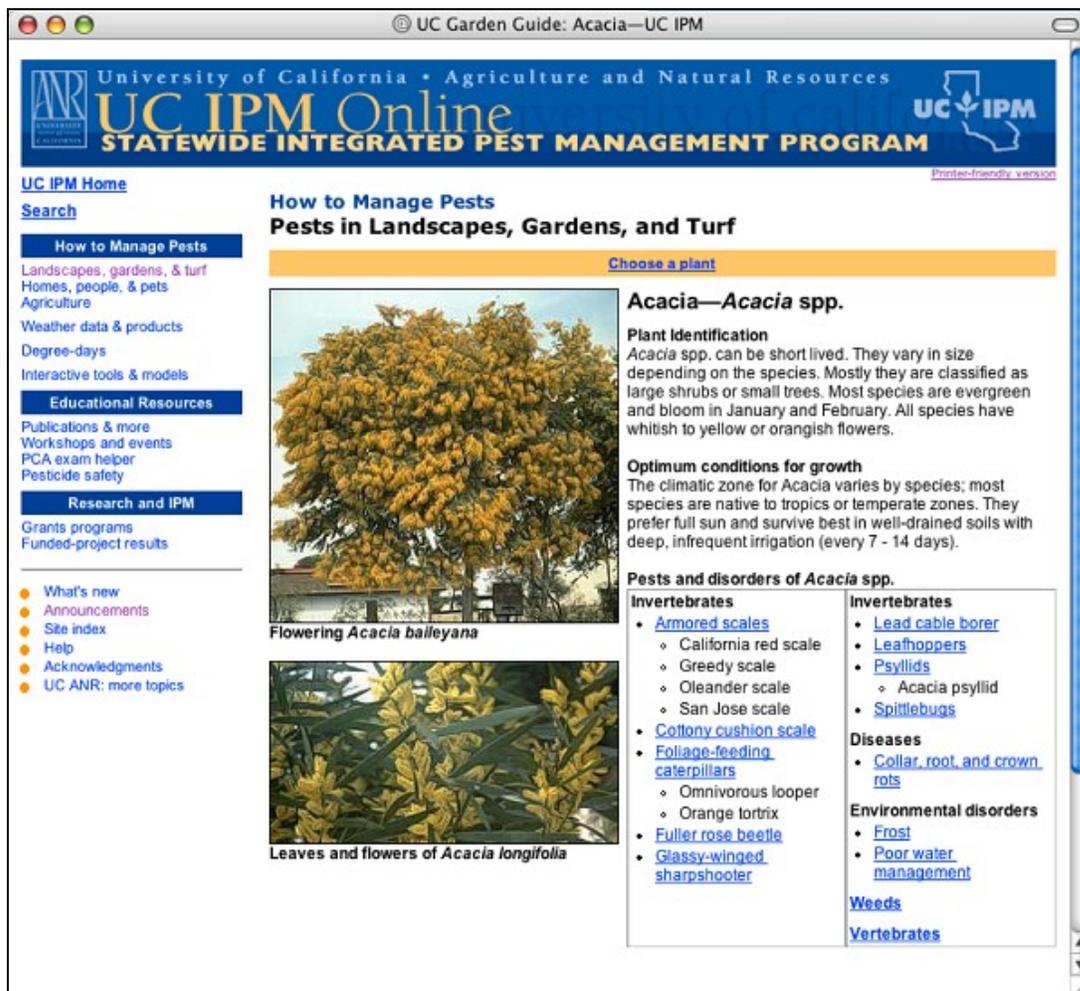
All screens from the vegetable section of the UC Guide have already been converted to web format. Cooperators are comparing the printed screens with the original UC Guide files before they are loaded onto the test web site and linked. The fruit tree screens are being converted now. We anticipate that the entire conversion will be completed in the next six to eight months.

As new Pest Notes are developed, they will be linked into the database where appropriate. The information on the site will be checked periodically to make sure it is up-to-date.

We are expanding this database with current funding from the Slosson foundation. We will be adding more than 100 new host plants and many new pests that aren't currently covered.

Expected results

We believe that this database will allow gardeners and landscape professionals to obtain pest management information much more efficiently than they could before. Master Gardeners and Horticultural advisors will also be able to find answers to questions they receive from the public more quickly. By organizing the database by host plant, we expect that plant identification and pest diagnosis will be made easier and that people will be better able to make informed decisions when managing pests.



The screenshot displays the UC IPM Online website interface. At the top, it reads "UC Garden Guide: Acacia—UC IPM". Below this is the header for the "University of California • Agriculture and Natural Resources UC IPM Online STATEWIDE INTEGRATED PEST MANAGEMENT PROGRAM". A navigation menu on the left includes sections for "How to Manage Pests", "Educational Resources", and "Research and IPM". The main content area is titled "How to Manage Pests" and "Pests in Landscapes, Gardens, and Turf". It features a "Choose a plant" button and two images: "Flowering *Acacia baileyana*" and "Leaves and flowers of *Acacia longifolia*". The right side of the page provides detailed information for "Acacia—*Acacia* spp.", including "Plant Identification", "Optimum conditions for growth", and "Pests and disorders of *Acacia* spp.". The "Pests and disorders" section is organized into "Invertebrates", "Diseases", and "Environmental disorders", each with a list of specific pests and disorders and links to further information.

UC Garden Guide: Acacia—UC IPM

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How to Manage Pests
Pests in Landscapes, Gardens, and Turf

Choose a plant

Acacia—*Acacia* spp.

Plant Identification
Acacia spp. can be short lived. They vary in size depending on the species. Mostly they are classified as large shrubs or small trees. Most species are evergreen and bloom in January and February. All species have whitish to yellow or orangish flowers.

Optimum conditions for growth
The climatic zone for Acacia varies by species; most species are native to tropics or temperate zones. They prefer full sun and survive best in well-drained soils with deep, infrequent irrigation (every 7 - 14 days).

Pests and disorders of *Acacia* spp.

Invertebrates <ul style="list-style-type: none">• Armored scales<ul style="list-style-type: none">◦ California red scale◦ Greedy scale◦ Oleander scale◦ San Jose scale• Cottony cushion scale• Foliage-feeding caterpillars<ul style="list-style-type: none">◦ Omnivorous looper◦ Orange tortrix• Fuller rose beetle• Glassy-winged sharpshooter	Invertebrates <ul style="list-style-type: none">• Lead cable borer• Leafhoppers• Psyllids<ul style="list-style-type: none">◦ Acacia psyllid• Spittlebugs Diseases <ul style="list-style-type: none">• Collar, root, and crown rots Environmental disorders <ul style="list-style-type: none">• Frost• Poor water management Weeds Vertebrates
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Figure 1. Pests and disorders and plant information for *Acacia* spp.

UC Garden Guide: Sawflies—UC IPM

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[Printer-friendly version](#)

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How to Manage Pests
Pests in Landscapes, Gardens, and Turf

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Sawflies

Sawflies are named for the adult female's sawlike abdominal appendage used for inserting eggs in foliage. Adults have two pairs of wings and are dark, wasplike, somewhat flattened insects, usually 0.5 inch long or shorter. Some species mine leaves or stems. Most exposed-feeding larvae have six or more prolegs on the abdomen and one large "eye" on each side of the head. Sawflies include species that feed openly on foliage and those that mine inside stems and leaves.

Pear sawfly larva



Identification of species [Life cycle](#)

Damage
 Most conifer sawflies chew needles or buds; a few mine in shoots and cause tip dieback. Broadleaf-feeding species may skeletonize or chew holes in leaves or mine tissue, causing winding, discolored tunnels. Different species roll leaves, web foliage, or cause plant galls. Some may feed in stems, causing wilting. Sawflies in forests in the western states can retard plant growth and occasionally kill trees in landscapes if populations are high.

Solutions
 Trees and shrubs tolerate moderate defoliation. Prune damaged foliage and stems. Parasitic wasps, predaceous beetles, or fungal and viral diseases commonly kill sawfly populations. Avoid broad-spectrum insecticides because of their adverse effect on natural enemies. [Insecticidal soap](#) or [narrow-range oil](#) kill exposed-feeding sawfly larvae but may damage blossoms. Pear sawfly larvae can sometimes be washed off plants with a forceful stream of water.

Skeletonized leaves caused by bristly roseslug



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Figure 2. Identification, damage, and solutions for sawflies, a common pest on ash and many other ornamental plant species.